Universal Registration Document **2020**

INCLUDING THE ANNUAL FINANCIAL REPORT

THE "RAISON D'ÊTRE" OF EDF

To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development.

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* This information is part of the annual financial report, as required by Article L. 451-1-2 of the French Monetary and Financial Code.

Universal Registration Document 2020

INCLUDING THE ANNUAL FINANCIAL REPORT

BE THE ENERGY FOR CHANGE.

This Universal Registration Document (URD) was filed on 15 March 2021 with the French Financial Markets Authority (AMF), the competent authority under Regulation (EU) 2017/1129, without prior approval in accordance with Article 9 of that Regulation. This Universal Registration Document may be used for the purposes of an offer of securities to the public or the admission of securities to trading on a regulated market if it is supplemented by a securities note and, if applicable, a summary and any amendments made to the Universal Registration Document. The set of documents formed thereof is approved by the AMF in accordance with EU Regulation 2017/1129.

The URD has been prepared by the issuer and its signatories are liable for its content. However, the version of the URD issued in French as mentioned above is the only binding version. The English language version is provided solely for the convenience of English speaking readers. All possible care has been taken to ensure that the translation is an accurate presentation of the original. However, in all matters of interpretation, views or opinion expressed in the original language version of the document in French take precedence over the translation.

Copies of this 2020 Universal Registration Document are available free of charge from EDF (22-30, avenue de Wagram, 75382 Paris cedex 08) and on its website (http://www.edf.fr), as well as on the AMF's website (http://www.amf-france.org).

In this Universal Registration Document (the "Universal Registration Document"), unless otherwise stated, the terms "Company" and "EDF" refer to Électricité de France SA, and the terms "EDF group" and "Group" refer to EDF and its subsidiaries and affiliates.

In addition to the information contained in this Universal Registration Document, investors should carefully consider the risk factors described in chapter 2 ("Risk factors and control framework"). These risks, or one of these risks, could negatively impact the Group's business, position, financial results or outlook. Furthermore, other risks not yet identified or considered as material by the Group, could have the same negative impact, and investors could consequently lose all or part of their investment in the Company.

This Universal Registration Document also contains information relating to the markets in which the EDF group operates. This information has been taken from surveys carried out by external sources. Given the rapid changes affecting the energy sector in France and throughout the world, it is possible that this information could prove to be erroneous or no longer on the filing date of this Document or thereafter. The Group's activities may therefore evolve in a manner different to that described in this Document, and the declarations or information presented in this document may prove to be erroneous.

Forward-looking statements in this Document, specifically in section 1.3 ("Group Strategy and objectives"), could also be impacted by risks, uncertainties and other factors that may cause the future income, performance and achievements of the Group to differ significantly from the objectives expressed and suggested. These factors may include changes in the economic and commercial environment, in regulations, as well as factors set forth in chapter 2 ("Risk factors and control framework").

French Energy Code, respectively responsible for the transmission and distribution of electricity within the EDF group, are not allowed to communicate certain information they gather while conducting their activities to other Group entities, including its Management. Similarly, certain data specific to Generation and supply activities cannot be communicated to the entities responsible for transmission and distribution. This Universal Registration Document has been prepared by the EDF group in compliance with these rules. For the sake of brevity, further references in this Universal Registration Document made to RTE and Enedis will not always specify their independent nature as within the meaning of the French Energy Code.

A glossary of the main technical terms is provided at the end of this Universal Registration Document.

Jean-Bernard Lévy
Chairman and Chief Executive Officer of EDF

To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development.

EDF's *raison d'être*, defined with the contribution of more than 4,000 employees as part of the "Let's Talk Energy" dialogue, was adopted by 99.99% of shareholders at the May 2020 General Meeting. Now enshrined in the Company's bylaws, it is at the heart of its business model, its CAP 2030 strategy and is reflected in its Corporate Social Responsibility commitments.

In response to the climate emergency, EDF is committed to a fair, innovative and sustainable energy future, with the ambition of achieving carbon neutrality by 2050. The Group wants to deploy increasingly low-carbon electricity thanks to nuclear power and the accelerated development of renewable energies. In 2020, the Group set itself new targets for reducing direct and indirect greenhouse gas emissions by 2030. In December, it obtained certification from the Science Based Targets initiative[1] for its CO_2 emissions reduction trajectory, well below the 2°C target of the Paris Agreement.

The development of electricity use, which is most likely to increase, is a major lever for supporting customers towards carbon neutrality. The Group actively contributes to this objective through a wide choice of offers adapted to the different markets. It offers a range of accessible and innovative energy efficiency services and solutions that enable everyone - individuals, businesses and local authorities - to play a role in the energy transition.

By forging partnerships in France and around the world, and by relying on R&D, EDF invests in innovation. As a driver of the energy transition, it enables EDF to build and propose solutions to achieve the objective of decarbonising uses at the lowest cost.

EDF is seeking to help preserve the planet's resources by aiming to limit its environmental footprint throughout the lifecycle of its facilities and activities, optimising the use of natural resources and developing the circular economy. The challenges of carbon neutrality go hand in hand with an approach that nurtures biodiversity, which were reflected by EDF's commitment in 2020 to two "Act4nature"[2] initiatives backed by the French State.

Of all energies, and because it is a basic necessity, electricity must be accessible to all and in all regions. It is also the energy of progress in an increasingly digital world. Wherever it operates, EDF wants to invent a new energy model that emits less CO_2, is more efficient and more respectful of the environment and people. Its ambition in all these areas is based on the strong commitment of its employees throughout the world.

This *raison d'être* brings people together, asserts EDF's values and identity, gives meaning to action and becomes the company's reason to do.

Jean-Bernard Lévy
Chairman and Chief Executive Officer of EDF

This* raison d'être *is in line with the values of progress and sharing that have inspired EDF's actions since its creation, as well as with today's major issue of addressing climate change and preserving the planet.

(1) Science Based Targets is a joint initiative by CDP, UN Global Compact, World Resources Institute, and World Wild Fund, begun in the wake of COP21 in 2015. More than 1,000 companies are already committed, over 500 of which now already have validated emission reduction targets.

(2) The aim of "*Entreprises engagées pour la nature-act4nature France*" ('Committed companies for nature – act4nature France') is to identify, recognise, and promote action plans in favour of biodiversity by French businesses. "Act4nature International" is an initiative launched by the French Association "*Entreprises pour l'Environnement*" ('Enterprises for the Environment', EpE), the aim of which is to mobilise businesses internationally with respect to their direct and indirect impacts, dependencies, and potential to engage in actions that are beneficial for nature.

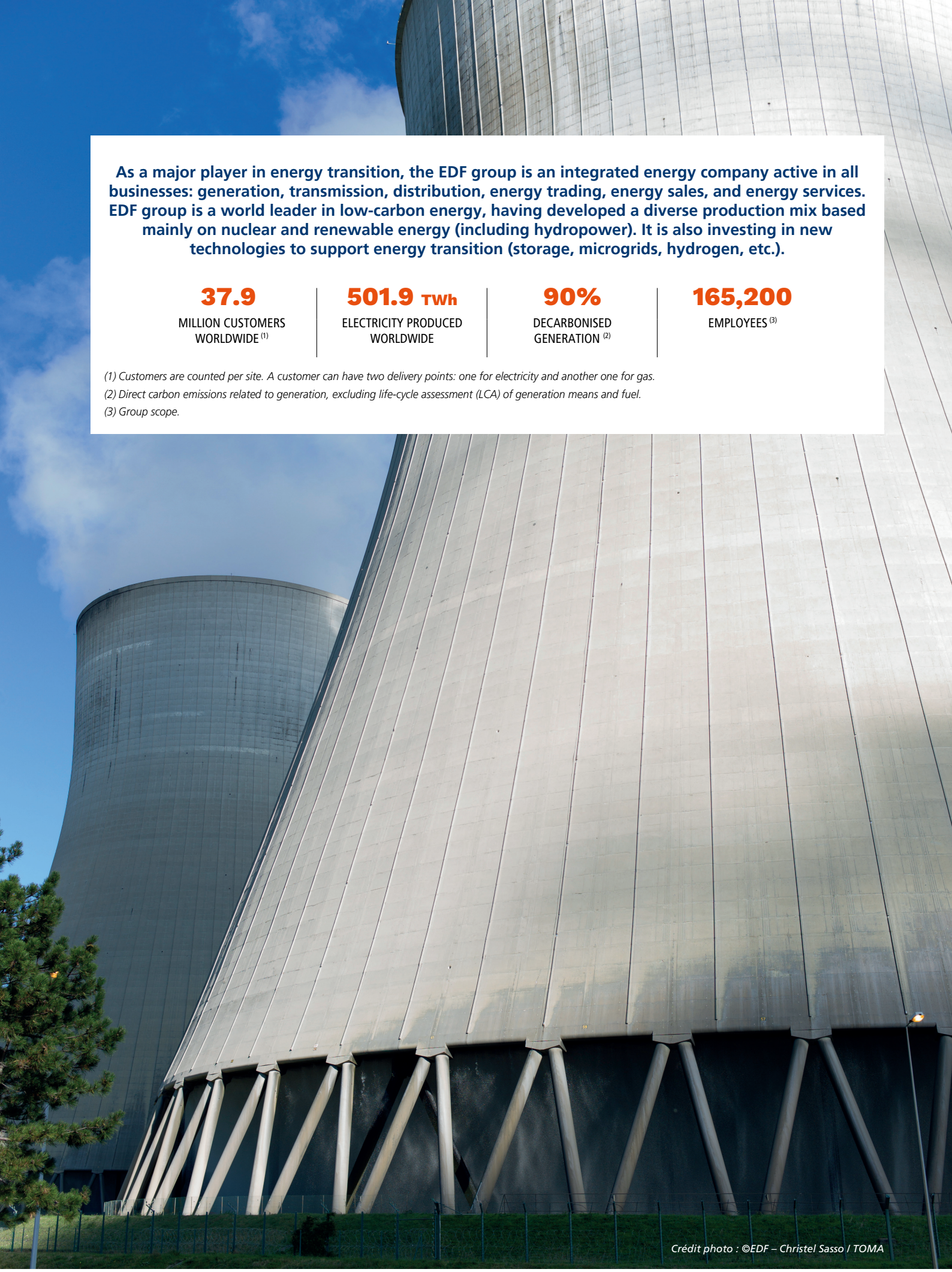
As a major player in energy transition, the EDF group is an integrated energy company active in all businesses: generation, transmission, distribution, energy trading, energy sales, and energy services. EDF group is a world leader in low-carbon energy, having developed a diverse production mix based mainly on nuclear and renewable energy (including hydropower). It is also investing in new technologies to support energy transition (storage, microgrids, hydrogen, etc.).

37.9	501.9 TWh	90%	165,200
MILLION CUSTOMERS WORLDWIDE (1)	ELECTRICITY PRODUCED WORLDWIDE	DECARBONISED GENERATION (2)	EMPLOYEES (3)

(1) Customers are counted per site. A customer can have two delivery points: one for electricity and another one for gas.

(2) Direct carbon emissions related to generation, excluding life-cycle assessment (LCA) of generation means and fuel.

(3) Group scope.



Crédit photo : ©EDF – Christel Sasso / TOMA

1

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2020 Key figures

An ambitious carbon trajectory

Emissions reduction (in $MtCO_2e$)

Scope 1

2017 ↘ **50%** 2030

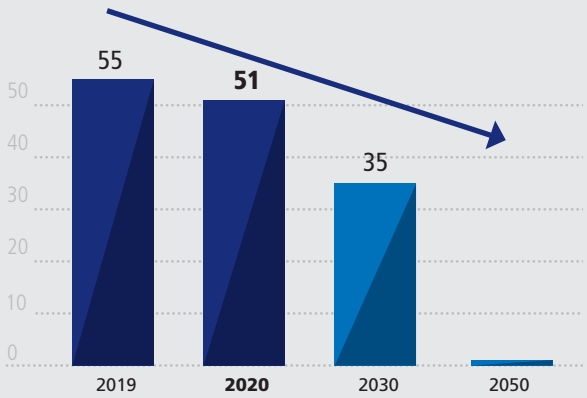
Scope 3

2019 ↘ **28%** 2030

Carbon intensity trajectory

CO_2 intensity (g/kWh)

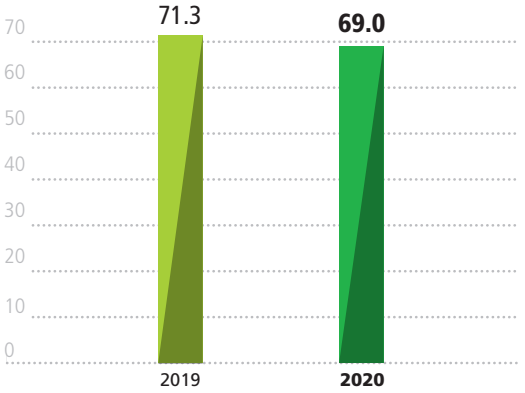
275[1] (European average in 2019)



(1) Average 2019 carbon intensity of power producers in Europe according to EEA.

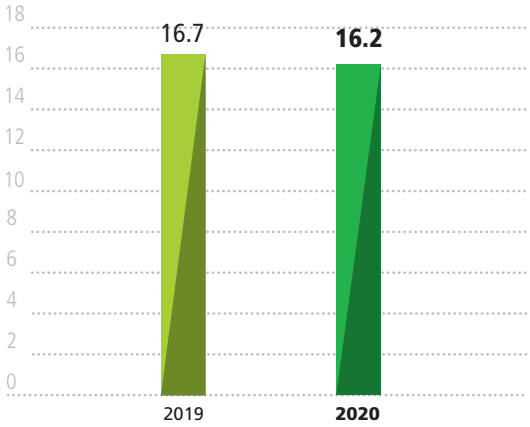
Sales

In billion of euros



EBITDA

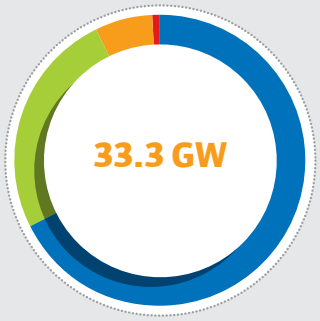
In billion of euros



EDF, the renewable energy leader in Europe

Net installed renewable capacity by sector

In GW

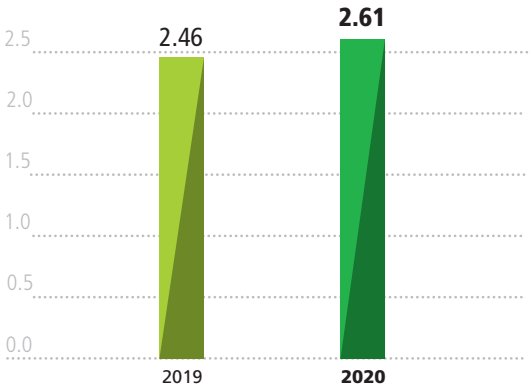


22.5 GW	Hydropower[1]
8.4 GW	Wind
2.2 GW	Solar
0.2 GW	Other

TARGET 2030
60GW NET

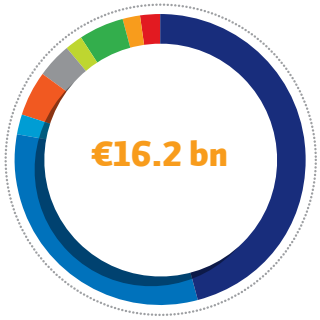
(1) Including sea energy 0.24 GW.

Net financial debt/EBITDA



Breakdown of EBITDA

In billion of euros

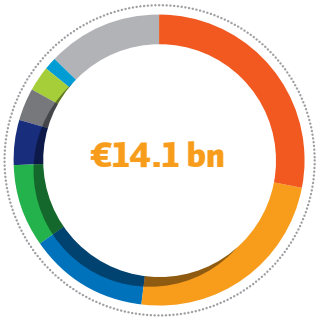


46%	France – Generation and supply activities
32%	France – Regulated activities [1]
2%	Framatome
5%	United Kingdom
4%	Italy
2%	Other international
5%	EDF Renewables
2%	Dalkia
2%	Other activities

(1) Regulated activities: Enedis, ÉS and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code.

Net investments excluding Group disposal plan

In billion of euros

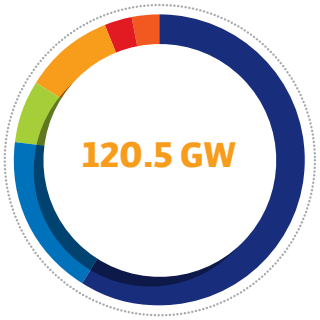


4.0	Nuclear maintenance including Grand Carénage
3.4	Énedis, SEI and ÉS
1.9	Hinkley Point C
1.3	Renewables
0.7	Linky
0.5	Flamanville project
0.4	Services
0.2	Framatome
1.8	Other [1]

(1) Mainly nuclear maintenance excluding France, thermal maintenance, France and United Kingdom nuclear development.

Installed capacity[1]

In GW

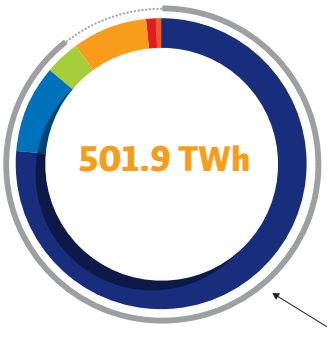


59%	Nuclear
18%	Hydropower
7%	Other EnR
10%	Gas
3%	Fuel Oil
3%	Coal

(1) Consolidated data.

Electricity generation[1]

In TWh



76.5%	Nuclear
9.8%	Hydropower [2]
3.8%	Other EnR
8.4%	Gas
1.0%	Fuel Oil
0.4%	Coal
90%	Decarbonised [3]

(1) Consolidated data.
(2) Hydro output including pumped storage consumption.
(3) Direct CO_2 emissions, excluding life-cycle analysis (LCA) of fuel and production means.

NB: The values correspond to the expression to the first decimal or integer closest to the sum of the precise values, taking into account rounding.

2020

Assets and resources

Customer proximity

- **32.7** million customers in electricity and **5.3** million customers in gas[1]
- Leading brands: EDF, Edison, Luminus, Dalkia
- **73** million visits on digital consumption monitoring platforms[2]

A human ambition

- **165,200** employees[3]
- **71%** of employees took part in a skills development initiative during the year[3]

An ambitious innovative ecosystem

- EDF Pulse Croissance, a structure dedicated to incubation and support for start-ups
- Nearly **2,700** R&D employees[4]
- R&D consolidated budget of **€685 M** in 2020
- **716** patented innovations at the end of 2020 by the Group's R&D

Major industrial assets

- **120.5 GW** of electricity generation capacity[5]
- An integrated nuclear industry
- EPR technology
- A **60 GW** portfolio of wind and solar projects[6]
- **1.4** million km of distribution network[7]
- **32** million smart meters installed[3]
- **330** heating and cooling networks operated by Dalkia

A solid financial base

- Total consolidated balance sheet: ~€300 bn
- No. 1 investor among European utilities (€16.5 bn in 2020)

A strong CSR commitment

- A rating CDP Climate Change
- No. 3 SUSTAINALYTICS
- €12.5 bn of green & sustainable funding

(1) Consolidated scope. Counted per site. (2) EDF SA scope excluding French overseas departments and Corsica. (3) Group scope. (4) FTEs (full-time equivalent) at Group level. (5) Consolidated data at Group scope. (6) Group scope. Pipeline excluding capacity under construction. All the projects in prospection phase included in the pipeline, starting 2020. (7) Enedis distribution network under concession.

Business model

The *raison d'être* of EDF

To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development.

CAP 2030

Three strategic axes to decarbonise our societies in France, in Europe and in the world:

A creator of services and solutions to support customers and territories in the shift towards carbon neutrality	A global leader in the generation of CO_2-neutral electricity	An international key player in the energy transition
>15 $MtCO_2$ AVOIDED EMISSIONS[1]	**↘ 50%** CO_2 eq DIRECT EMISSIONS vs. 2017	**EXIT** COAL
€10 bn revenue IN SERVICES[3]	**60 GW NET** **>x2** NEW RENEWABLES CAPACITIES (INCL. HYDRO) vs. 2015	**1.5-2 GW NET** HYDRO INSTALLED CAPACITY[4]
>1.5 CONTRACTS/CUSTOMER[2]	INITIATING **NEW** **EPRs & 1 SMR**	**1 MILLION** OFF GRID KITS

Supported by a new impulse of transformation, innovation, human ambition and new Corporate Social Responsibility commitments and **the implementation of 4 plans:**

LEPLANSOLAIRE · LE PLAN stockage électrique · LE PLAN mobilité électrique · LE PLAN excell Excellence nucléaire

Scope: (1) Customers, Services & Territories sector's activities. EDF estimate, including CO_2 savings linked mainly to heating and cooling networks, the development of the electric vehicle and energy saving certificates. (2) EDF estimate: France, UK , Italy and Belgium (Residential). (3) Group. (4) Excluding priority countries in Europe (France, Italy, UK and Belgium).

Value creation - 2020

The breakdown of CSR issues into 16 commitments

- Ambitious carbon trajectory
- Carbon offset solutions
- Adapting to climate change
- Developing electricity use and energy services
- Biodiversity
- Responsible land management
- Integrated and sustainable water management
- Waste and circular economy
- Health and safety for all
- Ethics, compliance and human rights
- Equality, diversity and inclusion
- Energy poverty and social innovation
- Dialogue and consultation with stakeholders
- Responsible development of local areas
- Development of industrial sectors
- Responsible digital development

For the climate

- A carbon neutrality ambition by 2050

SCIENCE BASED TARGETS — BUSINESS AMBITION FOR 1.5°C

- Electricity output of **501.9 TWh**, **90%** decarbonised[1] with emissions of **51g of CO_2/kWh**[2]
- EDF, a water sharing player: water intensity of **0.87 l/kWh**[3]
- A commitment to biodiversity

act4nature — Les entreprises pour la biodiversité

13 CLIMATE ACTION — 14 LIFE BELOW WATER — 15 LIFE ON LAND

Sustainable Development Goals – United Nations

For customers

- High customer satisfaction level
- More than **905,000** customers in financial difficulty received energy support[4]

1 NO POVERTY — 3 GOOD HEALTH AND WELL-BE — 7 AFFORDABLE AND CLEAN ENERGY — 10 REDUCED INEQUALITIES

For partners and territories

- More than **300** academic and industrial partnerships established worlwide by EDF R&D
- SMEs account for between **22** and **26%** of EDF and Enedis procurements
- **1** direct job at EDF SA generates **4.1** in the area[5]
- Nearly **84%** of projects are subject to consultation[6]

8 DECENT WORK AND ECONOMIC GROWTH — 12 RESPONSIBLE CONSUMPTION AND PRODUCTION — 16 PEACE, JUSTICE AND STRONG INSTITUTIONS

For employees

- An employee engagement index of **69%**[7]
- Women represent **28.7%** in Management Committees[8]
- An average salary equity ratio[9] of **6.6**

4 QUALITY EDUCATION — 5 GENDER EQUALITY — 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE — 11 SUSTAINABLE CITIES AND COMMUNITIES

Sales
€69.0 bn

EBITDA
€16.2 bn

Net income excl. non-recurring items
€2.0 bn

Sharing added value with our stakeholders

Suppliers
Purchases[10]
€41 bn
EDF Group Global CSR Agreement

States and Territories
Taxes[11]
€4.7 bn

Employees
Remuneration[12]
€14 bn

Shareholder Dividends
Target distribution rate[13]
45%-50%

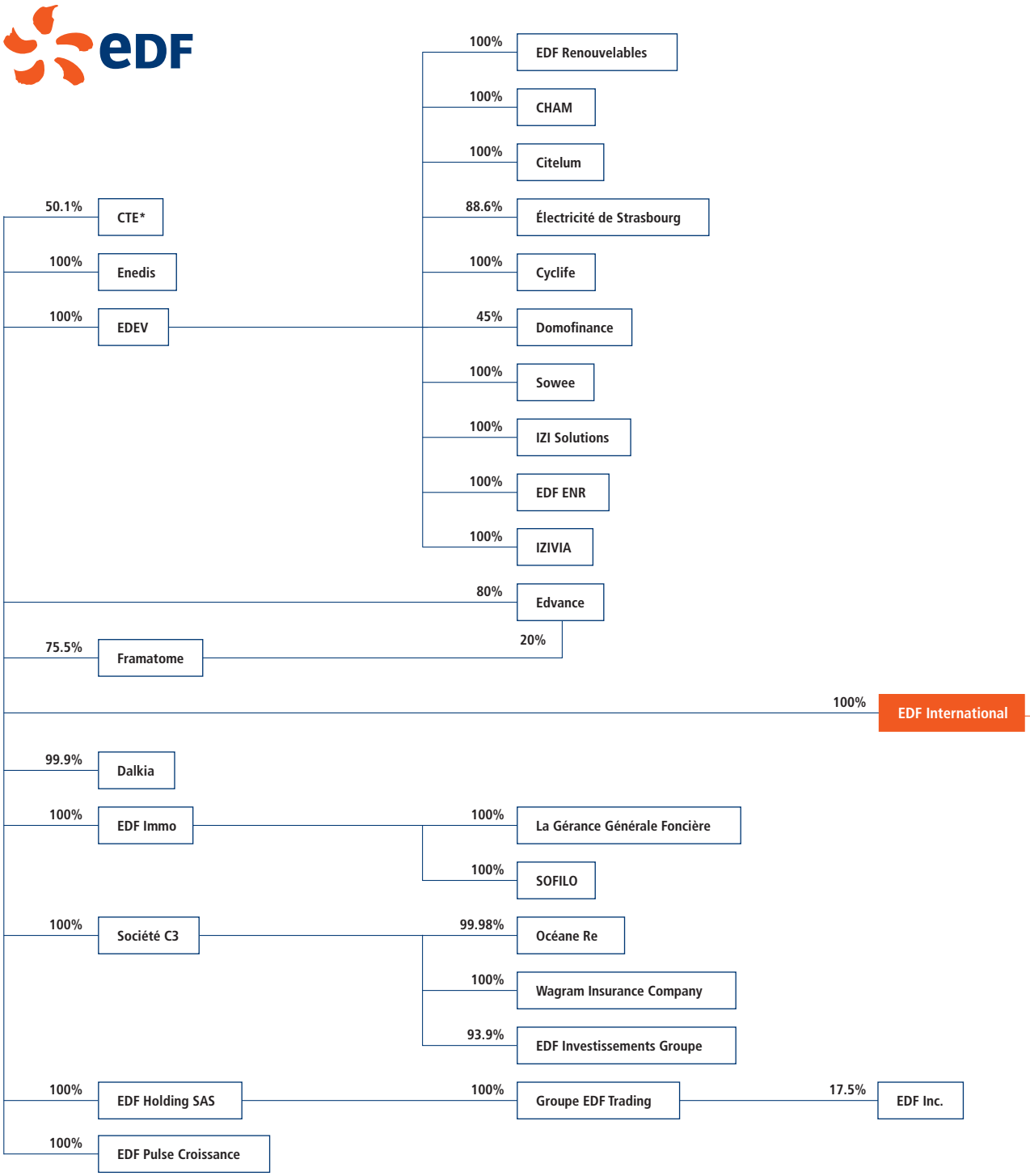
(1) Direct CO_2 emissions, excluding life-cycle analysis (LCA) of fuel and production means. (2) CO_2 emissions due to heat and electricity generation. Group scope. (3) Water consumed / electrical production of fleet. Group scope. (4) EDF SA scope. (5) Goodwill study based on the 2019 consolidated figures. (6) Projects over €50 m in accordance with the Equator Principles - Group Scope. (7) MyEDF Group internal survey. (8) Group Scope. (9) EDF SA scope - ratio established in accordance with the guidelines published by AFEP. (10) Consolidated purchases and other external expenses. (11) Consolidated taxes, including income taxes. (12) Consolidated personnel expenses. (13) Rate applied to net income from ordinary activities in 2021 and 2022 adjusted for the interest on hybrid loans recognised in equity.

1.2 Group's presentation

1.2.1 Organisation of the Group

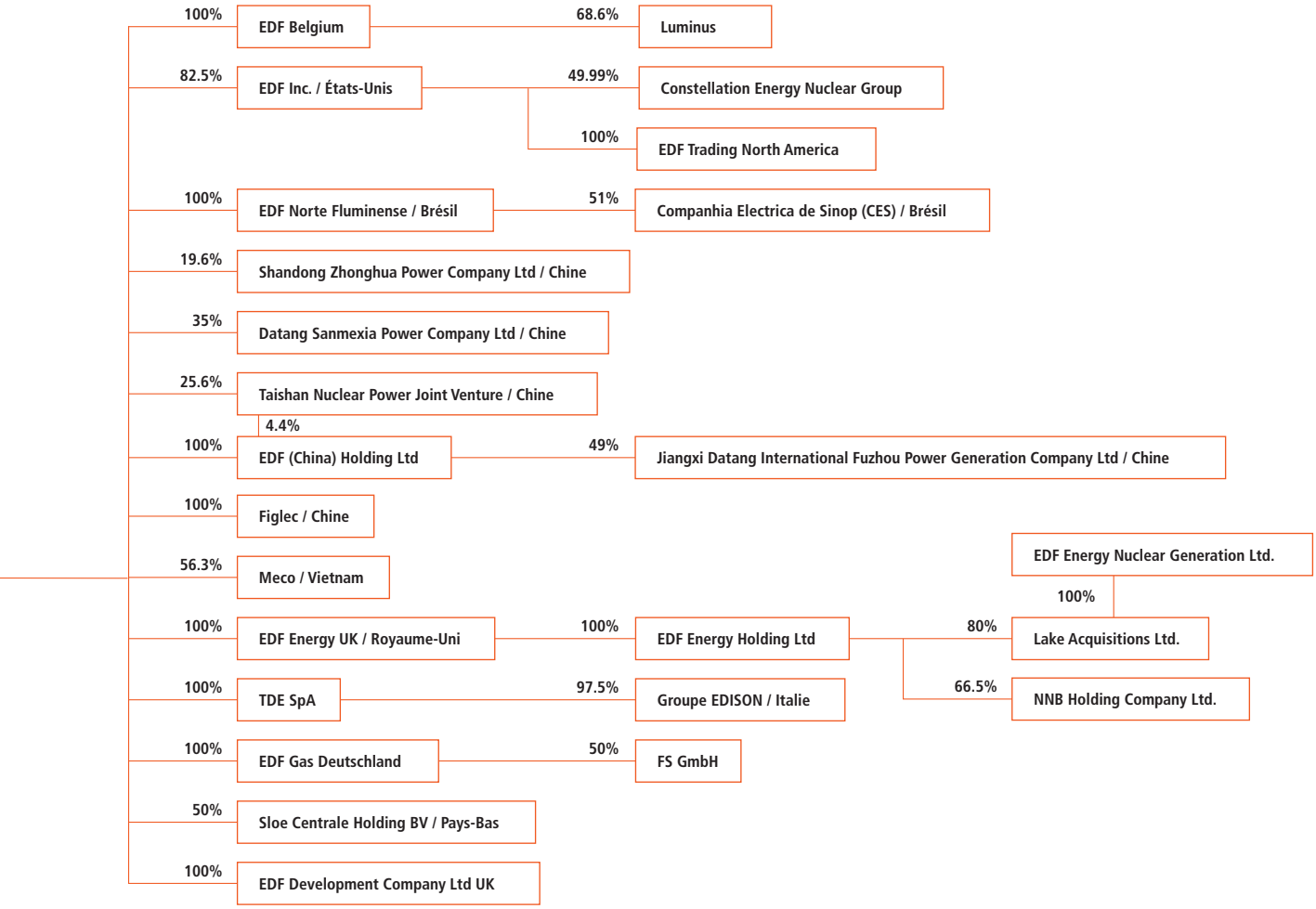
A simplified organisational chart for EDF group at 31 December 2020 is shown below. The percentages for each entity correspond to the ownership interest in capital.

The companies or groups of companies within EDF group's scope of consolidation are indicated in note 3.3 to the consolidated financial statements for the year ending 31 December 2020.

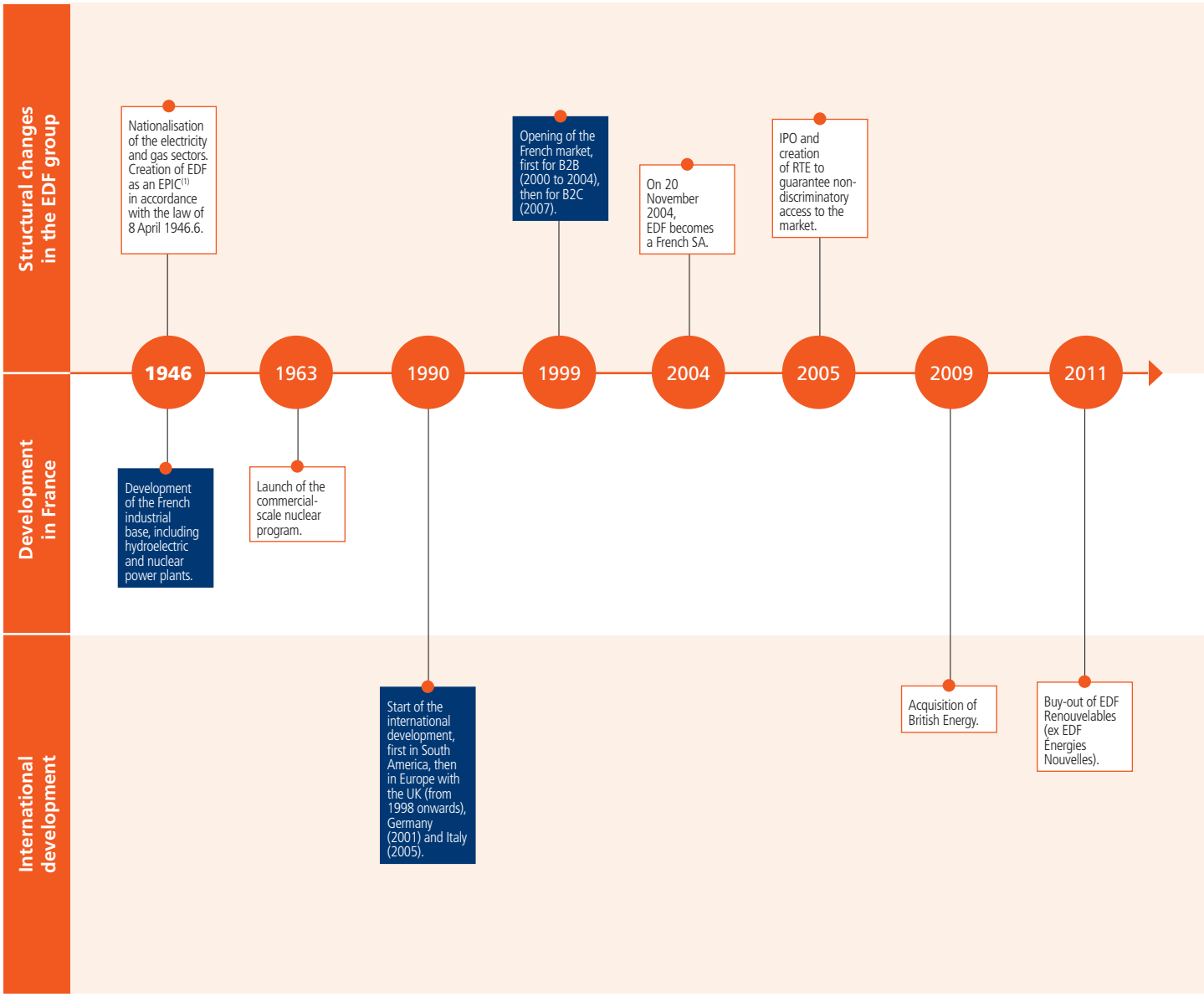


** Coentreprise de Transport d'Electricité or CTE, the company holding 100% of RTE.*

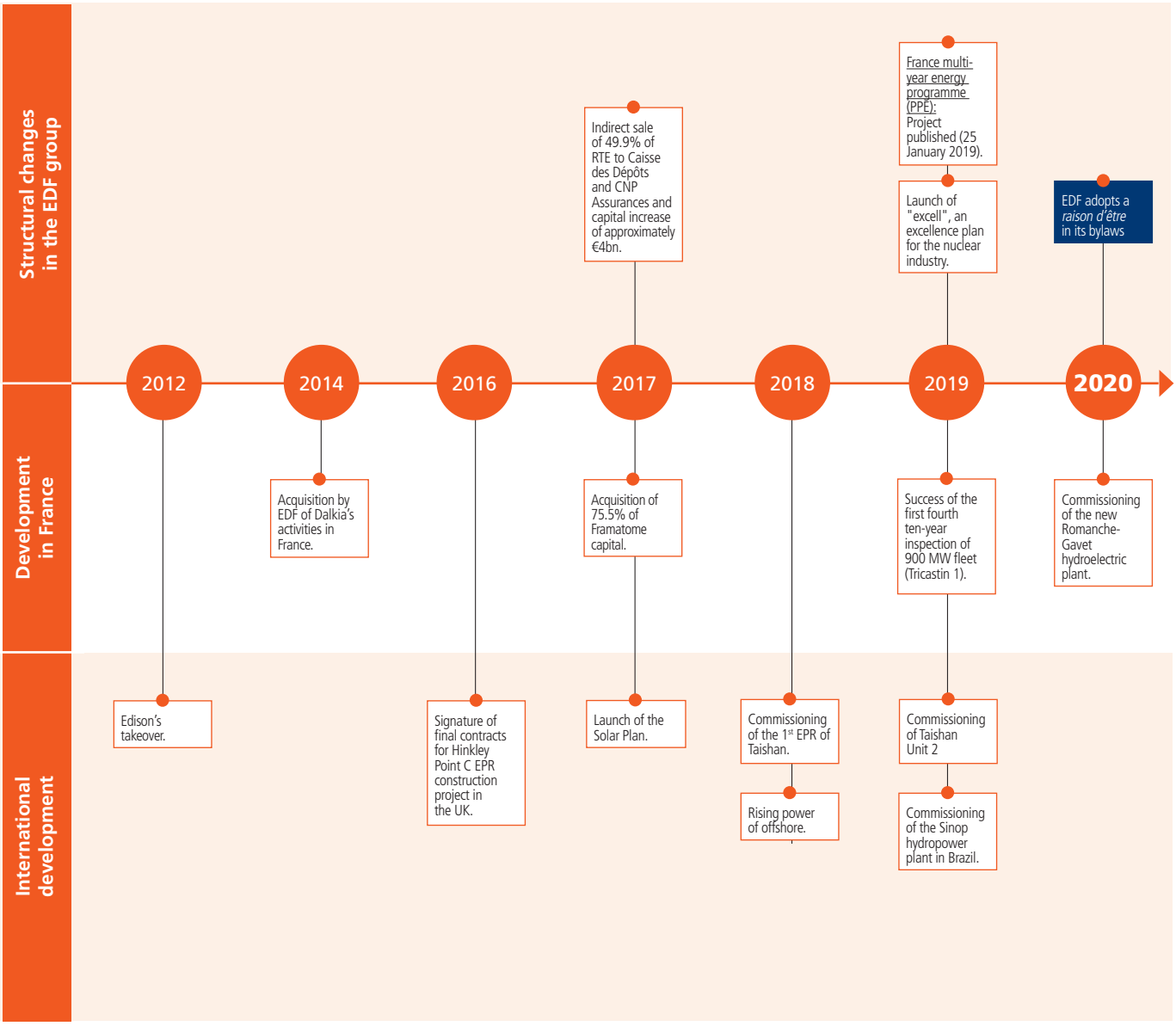
EDF International



1.2.2 History of the Group



*EPIC: Public Industrial and Commercial Establishment.


Structural changes in the EDF group
Development in France
International development
2012
2014
2016
2017
2018
2019
2020
Indirect sale of 49.9% of RTE to Caisse des Dépôts and CNP Assurances and capital increase of approximately €4bn.
France multi-year energy programme (PPE): Project published (25 January 2019).
Launch of "excell", an excellence plan for the nuclear industry.
EDF adopts a raison d'être in its bylaws
Acquisition by EDF of Dalkia's activities in France.
Acquisition of 75.5% of Framatome capital.
Success of the first fourth ten-year inspection of 900 MW fleet (Tricastin 1).
Commissioning of the new Romanche-Gavet hydroelectric plant.
Edison's takeover.
Signature of final contracts for Hinkley Point C EPR construction project in the UK.
Launch of the Solar Plan.
Commissioning of the 1st EPR of Taishan.
Rising power of offshore.
Commissioning of Taishan Unit 2
Commissioning of the Sinop hydropower plant in Brazil.

1.2.3 Significant events of the year

In adopting a *raison d'être* that was included in the company bylaws in May 2020, EDF has confirmed its aspiration to become a leader in energy transition towards carbon neutrality by 2050 and deepen its own climate-related commitments: these now include decreasing its direct CO_2 emissions by 50% by 2030 vs 2017 [1]. **In line with this aim, in 2020 the Group pursued its growth in renewable energy** [2] **and decarbonisation of uses and services** [3]:

- In solar power, the year saw several successful calls for tender. The Group was awarded the project for the construction of the Al Dhafra plant (2GW), [4] Abu Dhabi. In Rajasthan, India, 3 calls for tender went to EDEN Renewables India [5] (1,350MWp). In France, 190MWp of projects were awarded in calls for tender issued by the French Energy Regulation Commission (Commission de Régulation de l'Energie, CRE). In the United Arab Emirates, DEWA III, the third phase of construction (800MWac) of one of the most powerful solar power plants in the world, was completed. In the United States, the Group acquired a portfolio of up to 4.5GW of solar development assets [6];
- In wind power, the construction of the Fécamp offshore wind farm (500MW) was launched in France, to be commissioned at the end of 2023. Internationally, the Group completed the joint venture agreements for Dongtai IV and V, two offshore wind farms in China with total capacity of 502MW [7]. The construction of the Dumat Al Jandal wind farm (400MW) [8] in Saudi Arabia continued, and the first phase of the construction work on the Taza wind farm in Morocco (87MW) commenced. The Group also positioned itself in Ireland, acquiring 50% of the Codling offshore wind project, with expected total installed capacity of approximately 1GW [9];
- In hydropower, the new Romanche-Gavet hydroelectric plant (97MW) in Isère, France, was commissioned. In Cameroon, just over one third of the civil engineering works on the Nachtigal dam (420MW) were completed;
- In green hydrogen, the Group is starting a project to construct a 30MW electrolyser to produce green hydrogen from offshore wind power in Germany, as part of a 10-partner consortium [10];
- In microgrids, to broaden its range of offers, EDF group invested in startup Ecosun Innovations [11], a company developing innovative solutions aimed at supplying electricity to remote areas;
- In storage, the Group has operations in the United States, with the construction project for the Chuckwalla solar power plant in Nevada [12]; this is connected to a 4-hour 180MW battery storage system, providing electricity supply and demand balancing. The Group also signed a contract with CleanPowerSF for 4-hour 50MW battery storage in connection with the Maverick 6 solar project (100MW) in California;
- With regard to electric mobility, EDF group acquired Pod Point, one of the UK's largest electric vehicle charging companies [13]. As of the end of 2020, over 100,000 charge points had been rolled out by the Group, and over 5,000 use smart charging technology;
- In the field of electricity supply and energy services, the Group has expanded the range of solutions on its local services platform *IZI by EDF* in the fields of energy renovation, electric mobility, and the marketing of heat pumps. The Group also launched new offers: *Contrat Flexible* and *Vert Électrique Bretagne*;
- Dalkia has increased its expertise in electrical engineering with the acquisition of KSB Service EITB Sitelec, a company specialising in maintenance and renovation of electrical equipment [14];
- As of the end of 2020, 29.7 million Linky smart meters had been installed by Enedis, in line with its rollout programme [15].

More generally, the year was significantly impacted by the Covid-19 health crisis. The economic disruption led to a fall in demand for electricity and had major repercussions on many of the Group's activities, in particular nuclear power generation, worksites, and services. The estimated impact on the Group's EBITDA amounts to -€1,479 million at the end of December 2020.

Throughout this period, the Group has been able to adjust its business methods to ensure continuity of its essential missions: producing electricity, providing energy services, and local relations with customers [16].

With respect to nuclear power, the main effect of the health crisis has been a slowdown in the construction worksites in France and the UK. In France, the progress of the industrial programme, in particular operations scheduled during maintenance shutdowns, was severely affected, reducing electricity production capacity. In view of this, EDF has had to adjust the scheduling of reactor shutdowns for maintenance in order to contribute to security of supply for electricity during winter 2020-2021, in liaison with RTE.

The costs of the *Grand Carénage* programme between the present and 2025 have been readjusted, in particular to take account of the impacts of the crisis [17]. In the UK, the Hinkley Point C project has also been revised in order to factor in the impacts of the health crisis to date [18].

Despite the pandemic and thanks to the measures taken to adapt, the year saw a number of significant events, including:

- achieving nuclear production of 335.4TWh in France, higher than the production estimates made during 2020;
- milestone "J0", being achieved: this marks completion of the nuclear island common raft for the second Hinkley Point C reactor, on schedule [19];
- Framatome entering into several contracts, in particular an agreement with Rolls-Royce with a view to the acquisition of its Civil Nuclear Instrumentation and Control (I&C) business, which operates mainly in France, and to a lesser extent in China [20]. Framatome also launched the "*Framatome Défense*" brand to promote its business serving French national defence, affirming its commitment and strenghtening its contribution to this sector;
- finalisation of the first rollout phase of the excell plan. This aims to align the French nuclear industry with the highest standards of diligence, quality, and excellence required for the successful completion of nuclear projects. The excell plan calls for 25 new commitments by mid-2021 [21].

(1) See section 3.1.1.1.2 "2030 targets recognised by the SBTi initiative".
(2) See section 1.4.1.3.3 "Actvities of EDF Renewables".
(3) See section 1.4.6 "Energy services and other activities".
(4) With the partner Jinko Power Technology Co. Ltd. See EDF Renewables' press release dated 27 July 2020.
(5) EDEN Renewables India is a co-enterprise owned by EDF Renewables and Total Eren. See EDF Renewables' press release dated 1 October 2020.
(6) With Geenex Solar. See EDF Renewables press release dated 16 October 2020.
(7) Developed jointly with China Energy Investment Corporation (CEI). See EDF Renewables' press release dated 2 June 2020.
(8) In partnership with Masdar. See EDF Renewables' press release dated 29 July 2020.
(9) See EDF Renewables' press release dated 11 February 2020.
(10) See press release dated 5 August 2020.
(11) See EDF Renewables' press release dated 28 September 2020.
(12) See EDF Renewables' press release dated 29 July 2020.
(13) See the press release of 13 February 2020. See also section 1.4.5.1 "United Kingdom".
(14) See Dalkia's press release of 3 December 2020.
(15) See section 1.4.4.2.4 "Future Challenges" in section 1.4.4.2 "Distribution – Enedis".
(16) See "EDF, managing the health crisis as a responsible company" in the introduction to chapter 3.
(17) See the press release of 29 October 2020.
(18) See the press release of 27 January 2021.
(19) See EDF Energy's press release of 1 June 2020 See also section 1.4.5.1.2.5 "Nuclear New Build business" – "Hinkley Point C".
(20) See section 1.4.1.1.4 "Activities relating to nuclear power generation: Framatome."
(21) See section 1.4.1.1.1"excell plan".

In this URD, the consequences of the health crisis for the Group are dealt with from a number of points of view:

- the impact on the Group's activities is presented in the different sections of chapter 1.4 and in note 1.4 "Comparability (including the effect of the Covid-19 pandemic)" in the Group's audited financial statements at 31 December 2020, included in chapter 6;
- the impact of the pandemic on the risk factors to which the Group is exposed is set out in section 2.2;
- the introduction to chapter 3 describes support measures and initiatives taken by EDF for the benefit of its clients, suppliers, and employees.

1.3 Group strategy and objectives

1.3.1 Environment and strategic challenges

Energy efficiency and low-carbon electricity are at the heart of energy transition.

At present, electricity in France accounts for some 25% of final energy consumption worldwide, but only just over 11% of CO_2 [(1)] emissions (the figures internationally are 19% [(2)] and 40% [(3)] respectively). The fight against climate change is a major challenge for the planet.

The agreement reached in Paris at the 21st session of the Conference of Parties (COP 21) in 2015 confirms the effort being made to combat climate change and the ramping up of energy transitions beyond Europe. This agreement, which was ratified by 168 countries as well as the European Union, came into force on 4 November 2016.

In Europe, the Clean Energy Package finalised in 2019 and the Green Deal developed in 2020 should enable the European Union to become carbon-neutral by 2050. Recovery programmes in the wake of the Covid-19 health crisis have made climate issues an even higher priority.

The EU's Green Deal and the related national programmes are set to focus on **cutting CO_2 emissions as a priority, and as competitively as possible**, drawing on a locally-rooted industrial vision and facilitating the long-term fight against climate change.

The UK, which must undertake a major renewal of its electricity generation facilities, adopted the Climate Change Act in 2008 and established a market model consistent with that policy (Carbon Price Floor, Contracts for Difference, capacity market, consideration of a regulated asset base model for new nuclear generation facilities).

France's "Climate and Energy" Act (*loi relative à l'énergie et au climat*) of 8 November 2019 places cutting greenhouse gas emissions at the heart of French energy policy. The goal is now "*becoming carbon-neutral by 2050 by cutting greenhouse gas emissions more than sixfold*". France's **Multi-Year Energy Programme** (*Programmation Pluriannuelle de l'Énergie*, PPE), which lists the broad outlines of French energy policy, sets out a ten-year vision, vital for major industrial players. EDF agrees with the PPE's analysis: identifying sources of leverage, trajectories to change the energy mix and eliminate fossil energy. Transition to a carbon-free economy is needed, but this should be achieved whilst preserving households' purchasing power and companies' competitiveness.

To reach these objectives, the two major levers of actions are:

- lowering energy consumption by developing **energy efficiency** solutions (downstream); and
- switching from fossil fuel to carbon-free energy sources, with **carbon-free electricity** first and renewable heat (upstream).

Innovation, both upstream and downstream, will be an essential factor in these goals being successfully achieved.

1.3.2 Priorities of the CAP 2030 strategy

The CAP 2030 strategy is fully in line with EDF's *raison d'être* to "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development". Drawing on the contribution of employees during the "Let's Talk Energy" (*Parlons Energies*) dialogue, the *raison d'être* was added to the Company's bylaws at the Shareholders' General Meeting held on 7 May 2020.

For EDF, the fight against climate change is based on two catalysts: energy efficiency and energy decarbonisation. This conviction drives our strategy, which focuses on three priorities:

- **creating services and solutions to assist customers and local areas to achieve carbon neutrality;**
- **holding a world leading position in CO_2-neutral electricity generation;**
- **arising as a worldwide stakeholder in the energy transition.**

The Group, a producer of decarbonised electric power, develops solutions that enable everyone, at their own level, to play a role in the energy transition and promotes its low-carbon model internationally.

1.3.2.1 Creating services and solutions to assist customers and local areas to achieve carbon neutrality

Individuals, businesses and cities want to change the way they light, heat, produce, consume and travel... Everyone wishes to be a stakeholder in the energy transition. This momentum, an aggregate of individual initiatives and public decisions, is gradually expanding everywhere. EDF's goal is to assist customers and local areas to achieve CO_2 neutrality with accessible and innovative carbon-free and energy-efficient solutions.

In doing so, EDF develops the value of its customer portfolio in key European countries (France, UK, Belgium and Italy) thanks to an unparalleled customer relationship and an enhanced range of services and supply offers.

In 2030, EDF group is aiming to achieve sales of €10 billion in services [(4)] .

EDF is strengthening its positions in electric mobility (in France, the UK, Italy, and Belgium), in renewable heating and cooling networks in France, and in leveraging electrical flexibility and aggregation (in Europe).

Building on customer confidence and developing a broad range of offers, in particular in sustainable energy performance on residential and business markets, EDF is growing value per customer and is seeking to achieve more than 1.5 contracts per domestic customer in 2030 [(5)]. Offerings for green energy, self-consumption, energy efficiency services, local services, contracts covering performance and electrical / climate engineering, waste heat recovery, and biomass all address its customers' emerging needs.

(1) Source: French General Commissariat for Sustainable Development (*Commissariat général au développement durable*), Chiffres clés du climat (Climate: Key Figures), 2020 edition, page 32.

(2) International Energy Agency, World Energy Outlook 2020, Table A.3 page 343.

(3) Source: French General Commissariat for Sustainable Development, *Chiffres clés du climat*, 2020 edition, page 32.

(4) Group scope.

(5) EDF Estimates: France, United Kingdom, Italy and Belgium (domestic).

EDF's customers are increasingly aware of their environmental footprint; in response, EDF is providing affordable, innovative solutions granting them access to smarter, lower energy use:

- by contributing to decarbonisation of practices, through electrification of uses, in the sectors that produce the most CO_2:
  - **transport** [1]: for light commercial vehicles and urban public transport, battery solutions are increasingly emerging as the most appropriate. For some heavy-duty, long-distance transport (inland navigation, trains on non-electrified lines, etc.), hydrogen electrolysis and fuel cells offer advantages in terms of autonomy and making it possible to address certain regions' energy plans. For other heavy goods transport (trucks in particular), hydrogen and batteries could be in competition, with their respective market share determined by their relative competitiveness. For both, the original power source must be carbon-free electricity.

    To support massive rollout of mobility electrification, EDF is making practical commitments: investing in support for customers (consumers, companies, and local authorities); leveraging electric vehicle storage capacity; and producing and marketing hydrogen electrolysis,
  - **buildings**: the Group is highly committed alongside industry professionals, landlords, and local authorities to help them improve energy efficiency and transition towards decarbonisation of heating and cooling solutions. EDF offers a range of services covering everything from support and management of energy use through to decarbonisation and energy efficiency operations [2], in particular during renovation works. EDF also provides direct support for households through [3] *IZI by EDF*. Through its subsidiary Dalkia, the Group is actively engaged in developing heating networks and their decarbonisation (with the use of renewable energy sources or energy recovery) and the development of Energy Performance Contacts (*Contrats de Performance Énergétique*, CPE) for public buildings, companies, and residential complexes,
  - **industry**: EDF develops process electrification solutions, waste heat recovery, and low-carbon electrolytic hydrogen production, leveraging its R&D expertise for the benefit of its industrial customers, assisting them as they upgrade their production facilities (electric boilers and furnaces, etc.);
- building on the development of infrastructure, data, and the creation of low-carbon solutions;
- by helping its domestic customers, businesses, and local authorities to become more actively engaged with their energy consumption (self-consumption, digital consumption management solutions, heat pumps).

The aim of these solutions is for EDF to avoid the emission of over 15 million tonnes of CO_2 by 2030 [4].

In addition, EDF continues to innovate by developing new business models to assist its customers with energy transition and put into practice the Group's commitments regarding carbon neutrality. Innovation both downstream (energy efficiency and uses) and upstream (low-carbon energy production) will be an essential factor in covering the required ground, given the speed at which renewables technology is progressing from storage to electric vehicles *via* hydrogen power and digital developments. Building on its own R&D efforts and its innovation ecosystem developed with its partners, EDF group selects innovations with potential to accelerate enable energy transition, developing industrial resources in France wherever possible.

Lastly, energy transition will only be achieved if it is fair and equitable. EDF group assists its customers, in particular the most vulnerable, to help them use energy more wisely; in doing so, it is engaged in the fight against energy insecurity (see section 3.3.4 "Energy insecurity and social innovation").

1.3.2.2 Holding a leading position in low-carbon electricity generation

Because nearly 98% of electricity in France is carbon-free thanks to nuclear and renewable energies, EDF is playing a leading role of achieving carbon neutrality by 2050 by accelerating the development of renewable energies while guaranteeing the safety, performance and competitiveness of existing nuclear facilities and Nuclear New Build investments.

There is no single solution to deliver low-carbon electricity, but rather an array of solutions: nuclear power, hydropower, solar power, onshore and offshore wind power, renewable heat, grids, storage (in particular in electric vehicles), tools for managing flexibility in uses and production, etc.

- **EDF group's aim of achieving very low-carbon production is embodied first and foremost in the accelerated development of renewable energy in France and abroad.** EDF group is developing renewable electrical power using all types of technology (hydropower, solar power, onshore and offshore wind power, etc.) as well as renewable heat and waste heat recovery through its subsidiary Dalkia. Renewable energies already account for a quarter of the Group's overall capacity [5].

  EDF group is now the leader in renewable energy in Europe and, in particular, the leading supplier of hydropower in the European Union, with 22.5GW net installed capacity [6]. With some 11.0GW net installed capacity, the Group is also one of the world leaders in renewables other than hydropower, mainly wind power and solar power. EDF's goal is to increase rapidly its net installed capacity in solar and wind power.

  The target for 2030 is to achieve installed capacity for renewable energy (including hydropower) of 60GW net, the equivalent of more than twice the 2015 installed capacity. EDF group is seeking a balance between the different technologies (onshore and offshore wind power, solar power, and hydropower), and a balance in geographical distribution. Lastly, EDF regularly invests in hydropower facilities in order to combine economic, energy and environmental performance, and will propose solutions to strengthen hydropower generation.

  EDF is establishing a position as a European leader in the aggregation of renewable capacity and flexibility, and has set itself the target of tripling the Group's storage resources by 2035 as part of its storage plan.
- **The aim of very-low carbon production is also based on the performance of the nuclear industry**, by guaranteeing industrial expertise, safety, competitiveness, care for the environment, optimised operation of nuclear fleets in France and the UK, completion of works in progress (Flamanville 3, HPC), and implementation of an innovative fuel cycle strategy.

  EDF's nuclear generation fleet is the only one of its kind in the world. The *Grand Carénage* of the existing fleet in France has already begun and is a major industrial challenge. The related investment is designed to enable the plants in question to remain in operation beyond 40 years, guaranteeing nuclear safety, performance, and the protection of the environment.

  Nuclear power operation does not emit CO_2 [7]; it provides baseline production whilst offering strong leverage in terms of management and flexibility to adjust to electricity consumption. As such it can play a fully legitimate role through to 2050 in the low-carbon electricity mix, alongside renewable energy.

  With this in mind, EDF is building the Hinkley Point C reactor in the United Kingdom and the Flamanville reactor in France, as well as operating two reactors in Taishan, China. EDF is also developing other projects which may be built in countries seeking to have new reactors. In addition, EDF is finalising the design of a new-generation EPR.

  By 2030, the Group is seeking to be engaged in new EPR programmes in France, the United Kingdom, and elsewhere in the world, as well as in the development of a first Small Modular Reactor (SMR) demonstrator in France.

(1) Responsible for 24% of emissions relating to energy use worldwide – Source: French General Commissariat for Sustainable Development (*Commissariat général au développement durable*) *Chiffres clés du climat*, 2020 edition, page 32.

(2) Particularly through Energy Performance Contracts (*Contrats de Performance Énergétique*, CPE) and Energy Savings Certificates (*Certificats d'Économie d'Énergie*, CEE) in France.

(3) They may choose a heat pump to replace a fuel oil or gas-powered boiler emitting large quantities of CO_2.

(4) Customers, Service & Regions business – EDF Estimate, including CO_2 savings resulting mainly from heating and cooling networks, the development of electric vehicles, and energy savings certificates.

(5) 29.6GW at end 2020 out of a total of 120.5GW in consolidated data. Nuclear power accounts for 71.2GW.

(6) Including offshore power.

(7) No direct emission; LCA (life-cycle assessment) emissions can be estimated at $6gCO_2/kWh$ (source: Ademe).

EDF is also preparing for redeployments following final shutdowns, aiming to become the European leader in generation asset decommissioning, and is developing the circular economy.

- **Supporting energy transition by reducing the carbon footprint requires targeted development of electricity production projects using gas** to meet flexibility and energy transition requirements.
- **EDF has committed itself to ending the Group's coal-fired electricity generation by 2030.** In France, pursuant to the SNBC national low carbon strategy [(1)], the government has committed to halting coal-based electricity production by the end of 2022. EDF is also conducting a sustained innovation policy by investing in bioenergy and innovative carbon capture technologies.

The electricity produced by EDF group is one of the lowest-carbon in the world. To maintain its leadership, in 2020 EDF made new greenhouse gas reduction commitments for the period until 2030; these have been validated by the Science Based Targets Initiatives organisation as being ahead of the COP21 2°C goal. For the first time, EDF group has set itself targets covering not only its direct emissions but also its indirect emissions, in order to be on track to achieve carbon neutrality for its entire carbon footprint by 2050. By 2030, EDF aims to reduce its direct emissions by 50% compared to the 2017 level of emissions and to reduce its scope 3 emissions by 28% compared to the 2019 level of emissions (see section 3.1 "Carbon neutrality and the climate").

1.3.2.3 Arising as a worldwide stakeholder in the energy transition

To deal with the challenges of demographics, urbanisation and air pollution, many countries are looking for solutions that can improve the situation. EDF, which operates on four continents, supports this energy transition by exporting its expertise in nuclear power, renewable energies and energy services.

Internationally, there is considerable scope for innovation. EDF is seeking to triple its business (compared to 2015) through targeted development of its renewable energy, nuclear, and gas production assets, thus contributing to countries' energy transition.

By 2030, EDF group's goal is that of no longer having any coal-fired assets anywhere in the world, whilst also making a significant contribution to the development of renewable installed capacity, with a target of between 25 and 30GW net of renewables, including 1.5-2GW of net installed capacity in hydropower [(2)].

In terms of new business lines, EDF is aiming to have a portfolio of 1 million off-grid kits by 2030 and is pursuing the development of new markets such as microgrids, smart grids, storage, hydrogen, mobility, smart cities, etc., as well as further strengthening its positions in energy efficiency services, grids, and engineering services.

From a geographical point of view, EDF is seeking to strengthen its position in Europe, particularly in core countries (the United Kingdom, Italy, and Belgium), as well as to consolidate its position in China and North America. EDF is aiming to become a benchmark player in a limited number of priority countries in South America, Asia, Africa, and the Middle East, by means of a significant multi-business presence, thus providing coordinated support for energy transition in these target countries.

EDF is investing massively in energy transition, with some €15.5 billion of investments each year in low-carbon fields: nuclear power, hydropower, solar power, wind power, grids distributing low-carbon electricity, energy efficiency services, smart meters, hydrogen, and more; the financial performance of these investments is also a vital consideration. These fields accounted for some 94% of the Group's gross operating investments in 2020. Three-quarters of these are located in France and could constitute one of the drivers for post-Covid recovery.

In all the countries in which it operates, EDF group is implementing a strategy to adapt all its activities to the impacts of climate change. It aims at making its existing facilities more resilient to increasingly frequent extreme weather events (heat waves, droughts, storms, floods, etc.). On the other hand, the EDF group incorporates long-term climate change (average temperatures, sea levels, etc.) into the design of new facilities, particularly those with a lifespan of over 40 years, such as hydroelectric and nuclear plants (see section 3.1.2 "Climate change adaptation strategy").

1.3.2.4 Strategic priorities backed up by four plans plus a transformation programme, in line with the Group's *raison d'être* and business model

- These goals are pursued through the **four following plans** and a strategic work programme[(3)]:

LE PLAN mobilité électrique

EDF's **electric mobility plan**, launched in October 2018, aims to secure a 30% market share in the supply of electricity for electric vehicle in the Group's four major European markets: France, the UK, Italy and Belgium. The EDF group aims at rolling out 150,000 charging points and at operating 10,000 smart charging points by 2023. For its own fleet of light commercial vehicles, EDF is also rolling out the EV100 [(4)] programme and gradually converting its ICE vehicles into electric vehicles; the target is to be 100% complete by 2030.

LE PLAN stockage électrique

With the **storage Plan**, launched in 2018, EDF provides for the development of 10GW of new storage facilities in the world by 2035, increasing the Group's storage capacity by then to 15GW. EDF is aiming to develop a portfolio of 1 million off-grid kits by 2030. Storage is a key factor in stabilising network frequency, encouraging the inclusion of renewable energy, and managing microgrids in non-interconnected areas. It will be developed by using pumped energy transfer stations and giga-batteries.

LEPLANSOLAIRE

Through its **solar plan**, launched in 2017, EDF aspires to become the leader in solar photovoltaic energy in France with a 30% market share [(5)] of the sector by 2035.

LE PLAN excell Excellence nucléaire

With the **excell plan**, announced in December 2019 and launched in spring 2020, EDF is laying the groundwork for the French nuclear industry to recover the highest standards of diligence, quality, and excellence, required for the successful completion of nuclear projects. This is a key challenge: as a low-carbon source of energy, nuclear power has a significant role to play in the fight against climate change. In 2020, 10 transformation projects were carried out – a practical implementation of the

(1) Introduced by the French Energy Transition Act promoting green growth (*Loi de Transition Energétique pour la Croissance Verte*, LTECV), the National Low Carbon Strategy (*Stratégie Nationale Bas-Carbone*, SNBC) constitutes France's road map for combating climate change. It provides guidelines for implementing the transition to a low-carbon, circular, sustainable economy in all areas of business. It also defines a trajectory for cutting greenhouse gas emissions through to 2050 and establishes short to medium-term goals: carbon budgets. Its aim is twofold: to achieve carbon neutrality by 2050, and to cut the carbon footprint of French people's consumption. National and local public-sector decision-makers must take the SNBC into account.

(2) Excluding priority countries in Europe: France, Italy, the UK, and Belgium.

(3) The strategic work programme is composed of some twenty strategic projects managed at the Executive Committee level, which concretely implement each of the three strategic priorities.

(4) EV100 is a global initiative originating in New York at Climate Week NYC in September 2017. It aims to bring together multinationals committed to the development of electric mobility – and making it widespread by 2030.

(5) Market share expressed in terms of gross installed capacity.

commitments made in December 2019. They also opened the way for 25 new commitments to be honoured by mid-2021 [1] (see also section 1.4.1.1.1 "The excell plan").

- **The CAP 2030 strategy is grounded in EDF group's business model.** It is based on industrial control and integration of a whole set of activities and skills: very low-carbon production with the help of nuclear power and renewable energy, electricity production by operating and improving the grid, and offering solutions and services to customers. All of these activities contribute to positioning the EDF group as the leader in energy transition towards "zero carbon":
  - securing the long-term future of the especially competitive nuclear fleet, leading in hydropower and in the development of mature renewable energy (wind and solar power), and investing in innovative technologies (including in the field of storage) to rise to the challenge of delivering an increasingly decarbonised energy mix, in the long term, at all times, and at optimum cost;
  - investments in electricity grids are vital to the development of renewable energies and the electrification of practices;
  - the customer portfolio and regional involvement are key assets in the effective implementation of carbon-free energy practices and energy efficiency solutions facilitating more virtuous energy behaviours.

The complementary nature of these business lines, covering the entire decarbonised energy value chain, illustrates the relevance of EDF group's business model.

Enshrined in CAP 2030, EDF's strategy is rooted in this business model, focusing on economic and environmental performance and drawing on business lines geared to energy transition, R&D, [2] and innovation. It is fuelled by strong aspirations as regards human resources and the commitment of employees, called upon to maintain operational performance as they continue to adjust activities, skills, and working methods.

1.3.2.5 Group transformation

Health and safety, digital technology and new work practices, responsibility and simplification, skills and the recognition model are the five major levers of the Group's transformation.

In order to be able to face new challenges and meet the new expectations of the customers, employees and all the stakeholders, the Group adapts its managerial practices by empowering the teams, streamlining its organisations and *modus operandi*, as illustrated by a number of concrete examples since 2016 (introduction of fixed numbers of working days for managers, boosting career paths and promoting internal mobility and promotional training, streamlining and simplification of Group policies, etc.) and other more recent examples, such as the digital signature of contracts, first used for public procurement and secondly spread out to many other uses, and the simplification of financial and non-financial reporting.

In 2018, EDF also signed a new global agreement on Corporate Social Responsibility ("CSR agreement") which includes improvements in favour of diversity and to the benefit of Group employees. In 2019, a new management-labour dialogue approach was adopted, simplified and set up, in accordance with new legal requirements (see section 3.5.2.4 "Management-labour dialogue"). Highlights of 2020 in this respect include the Group's review of its support for internal mobility and the rollout of new aspirations for leadership (see section 3.3.3.6 "Skills development") in support of managerial transformation.

The transformation process is based in particular on mechanisms for coordinating networks of stakeholders "Let's Talk Energy", a collective intelligence initiative created in the first half of 2018 to harness the intelligence of EDF employees towards the construction of the Group's medium- and long-term scenarios (see section 3.4.1.1 "Commitment to dialogue and consultation process around our projects").

Since several years, the EDF group has placed the focus of digital transformation and innovation at the strategic level and has carried out an in-depth review of its internal organisation and training. The digital transformation involves employees and internal *modus operandi*, customer relations and the management and design of industrial assets.

Amongst other initiatives, 2019 saw the creation of an in-house academy devoted to new digital jobs; in 2020, the usage centre facilitated the rollout of digital resources and practices to enhance collaboration across the Company and facilitate working from home, which saw massive uptake due to the health crisis.

The Group engages with technology innovations through multi-business-line teams tasked with cross-functional subjects such as Artificial Intelligence, blockchain, the Internet of Things (IoT), and 5G telephony.

In the field of data, the Group has adopted in 2018 a data management policy and set up a "data analytics" plant for nuclear, thermal and renewable electricity generation, with the pooling of expertise. In 2019, this plant expanded its scope. A second plant came into being for tertiary sector data (real estate, purchasing, etc.). In 2020, the Group adopted an AI Ambition to speed up its progress in this field. On the occasion of its innovation showcase event "Electric Days" (held online due to the pandemic), EDF also unveiled an open data platform.

EDF's commitment was also embodied by the signature of a Responsible Digital charter created by Institut du Numérique Responsable (the French Institute for Responsible Digital Technology).

EDF group is also a founder member of Gaia-X [3], an initiative to promote the emergence of a European trusted cloud.

Performance improvement has always been a priority for the EDF group. The current economic and financial context further increases the urge for such improvement. The Group is strengthening control of its costs to bring them into line with its environment.

The approach is adjusted depending on the scopes involved (support divisions, operating entities, etc.) and have already produced results in terms of reduction of operating expenses, optimisation of the working capital requirement and improved management (cash-based management, project management team, cyber-security management), with the aim of enhancing the competitiveness of support activities and giving businesses performance levers.

In the nuclear sector, 2020 was marked by the roll out of the "excell" plan, which seeks to enhance the industrial quality, expertise and governance of major nuclear projects (see section 1.4.1.1.1 "The excell plan").

Furthermore, seeking to learn as many lessons as possible from the Covid-19 crisis, experimentation was also launched in the second half of the year (see section 3.3.1.3.4 "Wellbeing, organisation, and working time") to bed in the new managerial approaches and working practices put into place during the lockdown period.

1.3.3 Strategy and organisation

Pursuant to the CAP 2030 strategy, and in line with the guidelines adopted by the French authorities for the PPE, EDF group is mobilised to meet all aspects of the challenges of energy transition, in all territories in which it operates.

This ambition requires an overall reform of the conditions for obtaining a fair return on nuclear assets. In this context, the French government launched a consultation on adopting a new regulatory framework to replace the ARENH (see section 2.2.1 "Market regulation, political and legal risks - 1B Evolution of the regulatory framework") and has requested the Group's Executive Management to reflect on a new organisation in connection with this reform.

This possible change in the Group's organisation, which is envisaged only if the regulatory framework reform projects are carried out, could lead in particular to a spin-off of the downstream and services activities, grouped together in a structure (called "VERT"). VERT would also cover the Group's renewables and distribution business, in particular by holding securities in EDF Renewables and Enedis. The parent company (known as "BLEU") is aiming to retain ownership and control of the majority of VERT's share capital; the rest would be put to public offering. The French State would own a majority stake in BLEU, which would cover all nuclear and thermal capacities. The organisation of EDF's hydropower business is also being reviewed at present.

To date, the reorganisation project and the accompanying regulatory framework (known as the "HERCULE" project) are still being discussed by the French State and the European Commission. The outcome of these discussions cannot be predicted at this stage. In any event, the Group will ensure that implementation of the HERCULE project would preserve the integrated nature of EDF group and be accompanied by governance to secure this integrated arrangement.

(1) See the press release dated 15 October 2020 "EDF presents a first report on its excell plan for excellence in the nuclear industry".

(2) With 2,663 employees worldwide, over 300 academic and industrial partnerships across the globe, in particular with EDF R&D, and 716 patented innovations at the end of 2020, EDF group's R&D is entirely devoted to the challenges of energy transition.

(3) GAIA-X – European Association for Data and Cloud.

1.4 Description of the Group's activities

1.4.1 Electricity generation activity

Against a backdrop in which there will be more electricity usages, the Group has one of the largest power generation fleets in the world, with some of the lowest CO_2 emissions, thanks to the share of nuclear and renewable energy in its energy mix. The Group intends to greatly accelerate the development of renewable energy in France and worldwide, with the goal of achieving 60GW net in 2030, whilst building on its nuclear base, which is capable of modulating its power to adjust to the intermittent renewable energy production. The Group is also preparing for the nuclear energy of the future with EPRs.

120.5GW	33.3GW	90%
INSTALLED CAPACITY WORLDWIDE [1]	NET RENEWABLES CAPACITY	DECARBONISED GENERATION [2]

(1) Consolidated data.

(2) Direct CO_2 emissions related to production, excluding life-cycle assessment (LCA) of production means and fuel.

In mainland France, the electricity generation activities are split across the Nuclear and Thermal Fleet Department and the Renewable Energy Division. In addition to these two departments, the Engineering and New Nuclear Project Department is responsible for the development projects for the Group's new nuclear generation assets, in France and abroad.

Strengths of the generation fleet

The Group's generation fleet has significant strengths:

- a variety of means of generation, which enable adequate coverage of EDF's downstream portfolio needs (end users, sales to alternative suppliers, sales on the wholesale markets, etc.). The use of the different components of the assets is managed by placing the priority at any time on the resources offering the lowest variable costs:
  - run-of-river hydropower is used for base generation,
  - because of their low variable generation costs, nuclear plants are used for base and mid-merit generation,
  - adjustable hydropower generation (from dams) complemented by pumped-storage hydropower plants (STEPs) [1] and the thermal fleet are used for mid-merit and peak generation;
- a standardised nuclear fleet of 56 reactors in France (after the permanent shutdown of the two Fessenheim units) and 15 reactors in the United Kingdom;
- the construction of EPR-type reactors worldwide and the operation of 2 EPRs in China;
- the control of the entire life cycle of nuclear generation resources: design, operation, and decommissioning, and the implementation of actions aimed at improving the technical performance of power stations and extending operating lifespan;
- a fleet generating at 90% without CO_2 [2] emissions due to the predominance of nuclear and hydro-power generation facilities;
- a geographical position at the junction of electricity exchanges between the continental platform and the electric peninsulas (Italy, Spain and the UK).

Composition and specifications of the installed fleet

EDF fleet in mainland France

With total installed power of 87.01GW in mainland France [3] at 31 December 2020, EDF has the largest generation fleet in Europe, accounting for approximately 7.5% of the total installed power in the main countries in Europe [4].

In 2020 in mainland France, EDF's generation fleet produced 382.8TWh excluding pumped storage hydropower, and 389TWh including pumped storage hydropower.

At 31 December 2020, the capacity of EDF's generation fleet was mainly composed of:

- 56 nuclear units based on pressurised water reactors (PWR), with electrical power capacities ranging from 900MW to 1,500MW, and an average age of 35 years (see section 1.4.1.1.2 "Nuclear power generation in France");
- 20 functioning thermal units, with an average age of around 22 years (see section 1.4.1.2 "Thermal generation in mainland France");
- 427 hydropower plants, with an average age of 75 years [5] (see section 1.4.1.3.1 "Hydropower generation in France");
- other hydropower plants owned by the Group's subsidiaries: ÉS, SHEMA Group (100%), CERGA and RKI (on the Rhine, owned 50%-50% with German energy company EnBW) and the Franco-Swiss entities of Chatelôt and Emosson, accounting for a total of approximately 142MW of installed capacity in 2020.

(1) EDF operates 5GW of STEP in France and its engineering is referenced to the tune of 30GW abroad (e.g.: Israel, Chile).

(2) Direct CO_2 emissions related to production, excluding life-cycle assessment (LCA) of production resources and fuel.

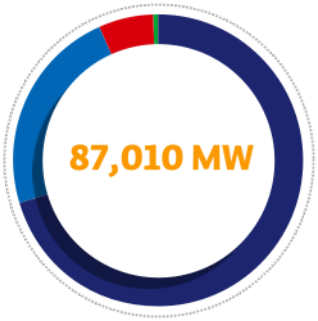
(3) Excluding Corsica and French overseas departments.

(4) i.e. the 35 member areas of ENTSO-E – European Network Transmission System Operators for Electricity – that includes Germany, Italy and Spain. Calculation based on the ENTSO-E statistics for the year 2018, as the statistics for the year 2019 and 2020 are not available.

(5) Arithmetic mean.

Installed capacity and output in mainland France – 2020

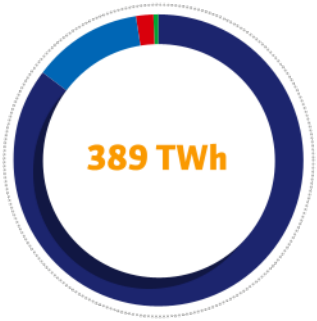
Installed capacity
In MW



61,370 MW	71%	Nuclear
20,103 MW	23%	Hydropower [1]
5,525 MW	6%	Thermal [2]
12 MW		Wind

Expressed in megawatts of maximum capacity linked to the network.
(1) Excluding Corsica and overseas departments, 439 MW in 2020 and including tidal generation capacity of 240 MW.
(2) Excluding Corsica and overseas departments, 1,567 MW in 2020.

Electricity Output
In TWh



335.4 TWh	86%	Nuclear
44.7 TWh	12%	Hydropower [1][2]
8.8 TWh	2%	Thermal [3]
0.02 TWh		Wind

(1) Excluding Corsica and overseas departments, 1.3 TWh in 2020.
(2) Generation including pumped storage consumption.
(3) Excluding Corsica and overseas departments, 4.4 TWh in 2020.
NB: The values take into account rounding.

Other geographic areas and subsidiaries

At the end of 2020, the Group also had installed power generation capacity of 33.5GW for electricity generation totalling 112.9TWh *via* the following entities:

	Installed capacity *(in GW)*	**Power generation** *(in TWh)*
EDF Renewables [1]	6.3	15.4
Island Energy Systems and PEI [2]	2	5.7
EDF Energy [3]	12.2	51.7
Edison [4]	6.4	18.8
Rest of World [5]	4.4	17.4
Dalkia [6]	2.2	3.9
TOTAL	**33.5**	**112.9**

(1) see section 1.4.1.5.4.
(2) see section 1.4.4.3.
(3) see section 1.4.5.1
(4) including outside the Italian market. See section 1.4.5.2.
(5) see section 1.4.5.3.
(6) see section 1.4.6.1.1.

1.4.1.1 Nuclear power generation

1.4.1.1.1 The excell plan

The aim of the "excell" plan is to enable the French nuclear industry to return to the highest standards of quality and excellence so as to take on existing and future major projects in France, the United Kingdom, and elsewhere in the world. The excell plan also benefits existing the nuclear fleet programmes, in particular *Grand Carénage* refurbishment and related maintenance operations. In October 2020, EDF group and the nuclear industry made 25 new commitments to be honoured by mid-2021, spread across 5 priority areas of work:

- state-of-the-art project governance, with the implementation of an inspection of major "new nuclear" projects to ensure maturity at each key milestone;
- upskilling the French nuclear industry, in particular the 21,000 professionals recruited between 2019 and 2022, with the help of "France Relance";
- guaranteed compliance of "right first time" manufacture and construction: in parallel with the "*excell in quality*" plan implemented at Framatome, all plants in the industry will be rolling out an excell plan aiming to achieve "zero defects";
- supplier relations based on more straightforward, results-oriented contracts: actions are being undertaken with "France Relance" to consolidate the industry;
- reinforcement of quality and safety by means of standardisation and replication to secure costs and lead times.

Given the specific challenges in terms of skills and quality, a "welding plan" has been put into place. This provides structure for the training and qualification of welders intervening on worksites in the nuclear industry.

See also section 3.4.3.1 "Adaptation of skills (excell plan)".

1.4.1.1.2 Nuclear power generation in France

The electricity generated by EDF in France from its fleet of nuclear power plants represented 87.6% of its total electricity generation in 2020 excluding pumped storage hydropower.

1.4.1.1.2.1 EDF's nuclear fleet in France and its operation

EDF's PWR model is divided into three series of available electrical power:

- a 900MW series consisting of 32 operating units of (for a total power capacity of 29,010MW) with an average age of 38 years;
- a 1,300MW series consisting of 20 operating units of (for a total power capacity of 26,370MW) with an average age of 32 years;
- the N4 series, which is the most recent with an average age of 20 years, consisting of 4 operating units (for a total power capacity of 5,990MW);

That is a set of 56 units, on 18 different sites (after the permanent shutdown in 2020 of the two 900MW Fessenheim units) owned by EDF, constituting total authorised capacity of 61,370MW at 31 December 2020. With an average age of approximately 35 years, EDF's nuclear fleet is about average compared to the fleets installed worldwide.

The commissioning and most recent ten-year inspection (VD) dates for these units as of end-2020 are as follows:

Units	Year of industrial commissioning	Most recent ten-year inspection	Next ten-year inspection	Units	Year of industrial commissioning	Most recent ten-year inspection	Next ten-year inspection
Bugey 2	1979	2010	*VD4	Cruas 3	1984	2014	VD4
Bugey 3	1979	2013	VD4	Cruas 4	1985	2016	VD4
Bugey 4	1979	2011	VD4	Chinon B3	1987	2020	VD4
Bugey 5	1980	2011	VD4	Chinon B4	1988	2020	VD4
Dampierre 1	1980	2011	VD4	Paluel 1	1985	2016	VD4
Gravelines 1	1980	2011	VD4	Paluel 2	1985	2018	VD4
Gravelines 2	1980	2013	VD4	Paluel 3	1986	2017	VD4
Tricastin 1	1980	2019	VD5	Paluel 4	1986	2019	VD4
Tricastin 2	1980	2011	VD4	Saint-Alban 1	1986	2017	VD4
Dampierre 2	1981	2012	VD4	Flamanville 1	1986	2018	VD4
Dampierre 3	1981	2013	VD4	Saint-Alban 2	1987	2018	VD4
Dampierre 4	1981	2014	VD4	Flamanville 2	1987	2020	VD4
Tricastin 3	1981	2012	VD4	Cattenom 1	1987	2016	VD4
Tricastin 4	1981	2014	VD4	Cattenom 2	1988	2018	VD4
Gravelines 3	1981	2012	VD4	Nogent 1	1988	2019	VD4
Gravelines 4	1981	2014	VD4	Belleville 1	1988	2010	*VD3
Blayais 1	1981	2012	VD4	Belleville 2	1989	2019	VD4
Blayais 2	1983	2013	VD4	Nogent 2	1989	2020	VD3
Blayais 3	1983	2015	VD4	Penly 1	1990	2011	VD3
Blayais 4	1983	2015	VD4	Cattenom 3	1991	2011	VD3
Saint-Laurent 1	1983	2015	VD4	Golfech 1	1991	2012	VD3
Saint-Laurent 2	1983	2013	VD4	Cattenom 4	1992	2013	VD3
Chinon B1	1984	2013	VD4	Penly 2	1992	2014	VD3
Cruas 1	1984	2015	VD4	Golfech 2	1994	2014	VD3
Chinon B2	1984	2016	VD4	Chooz B1	2000	2020	VD3
Cruas 2	1984	2018	VD4	Chooz B2	2000	2019	VD3
Gravelines 5	1985	2017	VD4	Civaux 1	2002	2011	VD2
Gravelines 6	1985	2018	VD4	Civaux 2	2002	2012	VD2

* *The fourth ten-year inspection of Bugey 2 and the third ten-year inspection of Belleville 1 were concluded at the beginning of 2021.*

At end-2020, all of the units of 900MW in operation had undergone their third ten-year inspections. Those of Chinon B3 and Chinon B4 units were completed in 2020. In 2019, the first fourth ten-year inspection was successfully conducted on Tricastin 1. The second was in 2020 at Bugey 2 (completed in early 2021).

For the 1,300MW fleet, 13 third ten-year inspections were conducted, one third ten-year inspection was underway at the end of 2020 (Belleville 1, which was completed at the beginning of 2021), and 6 are still to be carried out.

For the N4 series, two second ten-year inspections were carried out, at Chooz 1 and Chooz 2; two others (at Civaux) are pending.

EDF first-generation design plants have been gradually shut down and are currently being decommissioned. The Fessenheim plant has also been shut down in 2020 (see section 1.4.1.1.2.3 "Decommissioning of nuclear power plants").

Regulatory notice

Regulations applicable to basic nuclear facilities (BNFs)

After completion of a procedure set out in the French Environment Code (*code de l'environnement)*, the construction of a BNF is authorised by a decree issued by the French Prime Minister after consulting the French Nuclear Safety Authority (*Autorité de sûreté nucléaire*, ASN) and on the basis of a report produced by the Minister for Nuclear Safety. The authorisation to commission a BNF is issued by the ASN, also on completion of a procedure set out in the French Environment Code. The general regulations applicable to basic nuclear facilities, among other issues, make the protection of public safety, health and sanitation, nature and the environment (the "protected interests") a priority.

Generation allocation contracts: In the 1970-80's, EDF developed, industrial cooperation with European operators in the nuclear industry, in the form of generation allocation contracts backed by units of the EDF French nuclear fleet.

As at 31 December 2020, EDF has within its fleet ten generating units participating in the contracts (up to 1GW) with the following European energy companies:

- Cattenom 1-2: EnBW (5%);
- Bugey 2-3: Électricité de Laufenbourg [1] (17.5%);
- Tricastin 1 to 4: Electrabel [2] (12.5%);
- Chooz B1-B2: Luminus, EDF subsidiary in Belgium (3.3%).

The purpose of these generation allocation contracts is to make available to each partner the proportion of energy generated actually due to him, based on the share of the capacity allocated to him – in return for payment of their share of the construction costs, annual operating costs (including upstream and downstream fuel costs), local taxes and taxes specific to nuclear energy, and the costs relating to decommissioning. In these transactions, the partners have shared with EDF the industrial risks in the development of the fleet and assume the risks linked to performance concerning the current operation of the power plants. On the other hand, they have no operational role.

Furthermore, EDF signed a second type of generation allocation contract relating to a pool of power plants (totalling approximately 2GW) under which EDF makes available to its partners a share of the electricity determined by the level of availability of all or part of a standard fleet, applied to the capacity share reserved to the partners for the units concerned. These contracts mainly concern the following power plants:

- Chooz B1-B2 (N4 initial series unit): Electrabel (21.7%);
- Cattenom 3-4: Électricité de Laufenbourg (7.8%) and the Swiss electricity group CNP (21.8%).

Operation of the nuclear fleet

Nuclear power is a means of generation whose variable cost, mainly fuel-related costs, is low since it represents less than 30% of operating costs [3]. The main competitive levers of the nuclear fleet in its operating phase are thus the amount of generated energy and the optimisation of fixed operating and maintenance costs. The levers relating to the fuel cycle are described in section 1.4.1.1.2.3 "Nuclear issues" – "The nuclear fuel cycle and related issues".

Generation cycle and planned outages

To reconcile the challenges linked to the strong variations in seasonal consumption in France, due to its strong temperature sensitivity, the availability of maintenance resources and the efficient use of reactor fuel, EDF has adopted generation cycles of 12 and 18 months for its fleet broken down as follow (as of end-2020):

- 28 units of the 900MW series have an operating cycle of approximately 12 months;
- 4 units of the 900MW series, 20 units of the 1,300MW series and 4 units of the N4 (1,450MW) series have an operating cycle of approximately 18 months.

At the end of these operating cycles, shutdown periods are programmed in order to replace a fraction of the fuel loaded in the core and perform maintenance work. Two types of planned outages are alternated at the end of each generation cycle:

- an ordinary shutdown for refuelling, for a standard period of approximately 40 days. Unloading spent fuel and reloading new fuel is the main operation performed. Some maintenance or periodic testing may take place during this type of outage;
- a partial inspection for refuelling and maintenance for which the standard period [4] lasts approximately 85 days.

Every ten years, the power plant is shut down for an average period of 180 days [5] in average to carry out a ten-year inspection [6]. This length of time varies according to the works and maintenance programme, as well as the series concerned.

The programme for a ten-year inspection includes the following:

- unloading of spent fuel and reloading of fresh fuel, as at each outage;
- hydro-power test of the primary coolant system, a leak test of the containment, and inspection work of the reactor's pressure vessel;
- modification work, associated with ten-year safety re-evaluations;
- other specific maintenance operations, in particular renovation or replacement of major components.

At the end of each ten-year inspection, the ASN has to agree to the restarting of the reactor and make any relevant technical recommendations.

Regulatory notice

Nuclear safety authority (ASN)

The *Autorité de sûreté nucléaire* (ASN) is an independent administrative authority which contributes to the control of nuclear safety, radiation protection in France, and informing the public about these matters.

Its activity is organised around these main missions:

- contributing to drawing up legislation, giving its opinion to the Government on draft decrees and ministerial orders, and making regulatory rulings of a technical nature;
- examining all individual authorisation applications for basic nuclear facilities (BNFs). It grants authorisations except in the case of major BNF authorisations, such as for construction and decommissioning;
- inspection of installations, which it carries out through regulatory scheduled and unannounced on-site inspections, in particular on the occasion of regular compliance checks and safety reviews; these are mandatory for a power plant to continue operating.
- informing the public about the status of nuclear safety and radiation protection in France;
- lastly, in the event of an emergency, the ASN controls the operations to secure the installation carried out by the operator. It informs the public of the situation and assists the government. In particular, it provides the competent authorities with recommendations on the measures to be taken in respect of civil security.

Operation of EDF's nuclear fleet

Nuclear generation resources, owing to their low variable cost are first used for base-load generation, immediately after run-of-river hydro-power and other unavoidable renewable energies, as well as the energy purchased under buying obligations from decentralised energy producers. Variations in energy consumption over one year (summer-winter, day-night) and the currently restricted fluidity of wholesale markets due to limited interconnections on the borders lead nuclear energy to be used also for mid-merit generation. High variations in seasonal consumption in France and its major variation during winter months require that planned nuclear fleet outages be concentrated between April and October.

(1) Axpo Group.

(2) Engie Group.

(3) Operating costs are defined as follows: fuel costs (including downstream expenses in the fuel cycle), operating expenses (purchases and external services, employee expenses) and maintenance costs (expenses and investments). They do not include investments related to construction or decommissioning expenses.

(4) Standard durations represent optimised and realistic reference durations by outage types. They take into account the feedback from past outages. Outage planned durations fluctuate around these standard durations, depending on the work programme to be performed. In February 2020, EDF revised upwards its forecast outage durations to take into account the industrial reality observed over the 2016-2019 period.

(5) "Normal" duration excluding particular and/or extreme cases.

(6) Pursuant to Article L. 593-18 of the French Environment Code.

Generation and technical performance

The nuclear fleet produced 335.4TWh in 2020, down 44.1TWh compared to that of 2019.

Nuclear generation expressed in annual energy corresponds to a load factor rate referred to as "Kp" for the French nuclear fleet (defined as the ratio of energy generated to the maximum theoretical energy, or the energy generated if the installed capacity were operated year-round). This rate is obtained by multiplying two coefficients (Kp = Kd × Ku):

- the availability factor ("Kd") (the available energy [1] as a percentage of the theoretical maximum energy, or the energy generated if the installed capacity were operated year-round). The Kd depends on outage durations, and is therefore impacted by standard durations and the work programme to be performed;
- a utilisation factor, "Ku" (energy generated compared to energy available). The Ku factor reflects environmental, regulatory and social constraints, supply of system services and optimisation implemented by EDF (fuel and modulation).

In 2020, the Kp factor reached 61.65%, on a slight decrease compared with that of 2019 (68.6%). This results from a Kd of 71.9%, lower than in 2019 (74.0%) and a Ku of 85.7%, also lower than in 2019 (92.7%).

The Covid-19 health crisis had a measurable, quantifiable impact on nuclear power generation in 2020, as recorded in the information system logs. This impact is of different kinds: shutdown or suspension of critical worksites, additional modulation of the power of units, reorganisation of the shutdown schedule, etc.

For units in operation, the impact on activities is measurable, as the consequences on power generation are immediate or short term.

However, for unit shutdowns, in addition to the measurable impact, production was also affected by various causes which cannot be directly quantified. These various causes are mainly of two kinds: slowdown of activities (flow management, protective health measures, choke points, etc.) and fewer human resources available (positive cases, contact cases, rest time for first aid teams, etc.).

In short, the negative impact relating to Covid-19 on 2020 generation is estimated to be approximately 33TWh. In addition to the effects of the health crisis, the drop in power generation in 2020 compared to 2019 is due to the shutdown of the two Fessenheim reactors as well as:

- the shutdown of Flamanville 2 (ten-year inspection) and Paluel 2 (Simple Reload Shutdown – SRS) which continued throughout the 2020 campaign, due to major technical issues. The end of 2020 and the beginning of 2021 saw the return of these two units to the grid, on 14 December 2020 and 17 January 2021 respectively, having been shut down for 702 days and 449 days;
- a significant technical complication on a shared radioactive effluent collection tank for Bugey 2 and 3, resulting in the extension of the ten-year inspection of Bugey 2 and the shutdown of Unit 3 (as well as the extension of its SRS);
- exceptional incidents and large-scale contingencies (Flamanville 1 diesel – 10TWh, Cattenom 1 power transmission station – 1.1TWh).

Excluding the contingent loss at Flamanville 1, contingent losses for "operating units" had their best result since 2016 (3.2%).

In addition, production losses were suffered at the Chooz power plant due to the low water levels in the river Meuse.

Regarding performance achieved during unit shutdowns, on the whole the year-end results are equivalent to those of previous year, but were achieved against the backdrop of the health crisis from March 2020 onwards:

- the shutdown schedule for the 2020 campaign suffered significant upheaval due to the health crisis, requiring major adjustments to the work programmes, and causing disruption to preparation;
- some shutdowns were extended by more than 50 days, notably the partial inspections at Cattenom 2, Civaux 1, Cruas 3, Blayais 3, and Gravelines 6, and the ten-year inspection at Chinon B4. These shutdowns, some of which began during the first lockdown, met with significant complications (for a diesel generator at Cattenom 2, on an ASG pump [2] at Civaux 1, and on an RRA exchanger [3] at Chinon B4);
- the most remarkable performance of the 2020 campaign was the SRS for Dampierre 3, completed in 27.2 days. This duration was the best performance for the fleet since 2014. Also noteworthy was the SRS for Tricastin 1, completed in 35.6 days. Regarding more consequential shutdowns, the successful ten-year inspection at Nogent 2 and partial inspection at Tricastin 4 can be noted.

It should be noted that the action plan implemented to secure power generation level has made it possible to ensure a sufficient level of output for the winter months of 2020/2021.

Investment programme for the existing nuclear fleet in France

EDF's industrial strategy is to operate the existing nuclear fleet well beyond 40 years under the best conditions of nuclear safety, security and environmental protection (see section 1.4.1.1.2.3 "The challenges specific to nuclear activity" – "Preparing for the future of the nuclear fleet in France"), which requires to keep on performing significant maintenance operations over the 2014-2025 period.

On 22 January 2015, EDF's Board of Directors approved in principle a major overhaul programme (the *Grand Carénage*) aimed at refurbishing the French nuclear fleet, enhancing reactor safety and, if conditions allow, continuing their operation. This programme incorporates additional safety improvements identified following the Fukushima accident.

This industrial programme is being gradually implemented in compliance with the objectives of the Energy transition for green growth Law, multi-year energy programmes and the opinions and orders of the ASN as well as specific procedures for reactors to run for more than 40 years.

The initial investment amount stood at $€_{2013}$55 billion (€60 billion in current euros) in total over the 2014-2025 period for the 58 reactors currently operating [4] and covered both usual maintenance spending and investments required to extend the lifespan of equipment (replacement of the steam generators, VD4 900, VD3 1,300).

The optimisation work undertaken since (reductions and postponements) led to a downward revision of the overall cost of the programme to $€_{2013}$ 45 billion (or €48 billion in current euros) over the 2014-2025 period. This revision is largely a result of continued optimisation efforts regarding the adopted technical solutions and component replacement strategies and greater precision in their application by integrating the capacities of the industrial base, which enabled certain expenses to be postponed. Bringing forward the shutdown date for the Fessenheim plant in 2020 has also been taken into account.

(1) Available energy is equal to the maximum theoretical energy less generation losses due to technical reasons inherent to power plants, such as planned outages, unplanned outages due to failure or safety requirements, and performance of regulatory tests.

(2) Steam generator back-up auxiliary power supply.

(3) Cooling circuit for the reactor when shut down.

(4) The figures presented by the French Cour des Comptes in its report of 10 February 2016 cover a longer time horizon, up to 2030, and included, beyond the investment, operating and maintenance expenses. Both assessments are consistent, as stated by the *Cour des Comptes* in its report. Indeed, among the overall estimates calculated by the *Cour des Comptes* and amounting to close to €100 billion for the 2014-2030 period, the investment -expenditures estimated at €74.73 billion should be distinguished from the operating expenditures estimated at $€_{2013}$25.16 billion. Within the $€_{2013}$74.73 billion of investment expenses between 2014 and 2030, $€_{2013}$55 billion are dedicated to the 2014-2025 period, which allows the two estimates established by the EDF group and the *Cour des Comptes* to be connected.

In 2020, EDF readjusted the cost of the *Grand Carénage* refurbishment programme for 2014-2025 to €49.4 billion in current euros [1]. For the most part, this new estimation incorporates the first lessons learned for the works to be conducted, drawn from the investigations process during the fourth regular re-examination of 900MW reactors, which was concluded with the ASN decision rendered on 23 February 2021. It includes studies, alterations and additional equipment not originally planned for, aimed at improving safety levels. It also includes the review of the planned duration for scheduled maintenance shutdowns (ten-year inspections and partial inspections), drawing on the experience of previous years, as well as the impact of the health crisis as estimated in 2020, applied to 2020-2022 [2].

Under this programme, the planned renovation or replacement of major components of power stations such as generators, transformers or steam generators continue.

At end 2020:

- the alternator stator renovation programme was completed (49 renovated units);
- the programme for preventive replacement of the poles in the main transformers is ongoing. 144 main transformer poles out of 174 had been replaced, *i.e.* approximately 83% of the programme;
- the steam generators of 27 out of the 32 units of the 900MW series were replaced.

In addition, at 31 December 2020, 55 out of 56 Emergency Diesel Generators were put into operation. The 56th, Paluel 1, was commissioned in February 2021.

Industrial work will continue beyond 2025 on the occasion of the upcoming ten-year inspections. Capital expenditure will therefore remain high beyond 2025.

1.4.1.1.2.2 Environment, nuclear safety, radiation protection

Environmental protection

EDF's environmental procedure was introduced in 2002 on a few sites, then extended to all nuclear generation units. It is based on an ISO 14001-certified SME environmental management system (see section 3.5.2.5.2 "Environmental management system").

For a description of radioactive waste processing downstream of the fuel cycle as well as decommissioning, see sections 1.4.1.1.2.3 "The challenges specific to the nuclear activity" – "The nuclear fuel cycle and related issues" and "Decommissioning of nuclear power plants".

A constant nuclear safety procedure

EDF, in its capacity as a nuclear operator, takes responsibility for nuclear safety and, in a rapidly-changing context (market competition, environmental issues, etc.), reaffirms as its absolute priority the protection of the human and environmental health, among other things, through the prevention of accidents and the limiting of their consequences as regards nuclear safety.

The implementation of the French nuclear power programme led EDF to establish a safety procedure that:

- takes into account, from the design stage, the risks that might arise during the operation of the power plants, whether relating to the actual operation of the facilities or to internal or external attacks;
- is based both on the application of strict rules of operation, and on the cautious and inquiring attitude of the technical teams by means of the establishment of a true safety culture;
- is based on the cumulative experience of a standardised fleet;
- incorporates a continuous improvement approach that is notably embodied by the ongoing efforts to decrease the number of automatic reactor trips;
- benefits from integrated nuclear engineering and Research & Development within the Group in order to anticipate the occurence of failures, maintain the facilities in good working order, develop equipment on an ongoing basis, reassess safety margins and monitor technology advances, as well as the implementation of more effective new technologies and the management of sites being decommissioned;
- relies strongly on the development of skills; with this objective in mind, each nuclear generation site is equipped with a simulator used for training to cope with any type of situation.

Regulatory notice

Nuclear transparency

The French Environment Code (*Code de l'environnement*) includes specific provisions on the right to information regarding the nuclear industry aimed at guaranteeing the public's right to reliable, accessible information. In particular, the operator of a BNF is required to declare any accidents and incidents occurring as a result of the operation of the facility that could potentially be detrimental to the interests referred to in Article L. 593-1 of the French Environment Code, namely public health and safety and/or the protection of nature and the environment, and to do so speedily to the ASN and the competent administrative authority.

Other authorities also contribute to transparency for the nuclear industry. They include the Haut Comité pour la transparence et l'information sur la sécurité nucléaire (High Committee for Transparency and Information on Nuclear Safety, HCTISN) as well as local information committees formed for any site housing one or more BNFs.

The control system

Nuclear safety is subject to numerous controls, both internal and external.

- For example, every four years, EDF performs overall safety assessments for each nuclear power plant, which take place over a three-week period and involve approximately 30 inspectors. In addition, the General Inspector for Nuclear Safety and Radiation Protection, reporting directly to and appointed by EDF's Chairman and CEO, holds discussions with employees in the nuclear industry, enabling an opinion to be issued each year on the overall safety of the nuclear fleet and improvement actions to be suggested to the Company's management. Efforts by EDF, notably to improve human performance, have made it possible to decrease the annual average number of automatic reactor trips in recent years, and do so by a factor of four over a period of twenty years. In 2020, there were 14 for the entire fleet (a new historic record).
- Nationally in France, safety is controlled by the ASN by means of:
  - scheduled or unannounced inspections carried out by the ASN (about 450 inspections in 2020 over all EDF nuclear facilities);
  - a periodic (ten-year) review process designed to improve the compliance of nuclear plants with applicable rules and update assessments of the risks facilities pose to the environment and public health, taking into account the state of the facilities, the experience gained during their operation, new developments in nuclear science, and rules applying to similar facilities. The targets are established by the ASN which monitors compliance; EDF proposes solutions to meet these targets and implements them after obtaining the approval of the ASN (see section 1.4.1.1.2.1 "EDF's nuclear fleet in France"). The periodic review is an important step in continuing the operation of power plants (see section 1.4.1.1.2.3 "The challenges specific to nuclear activity" – "Preparing for the future of the nuclear fleet in France").
- At the international level, regular inspections are held making it possible to share the experience gained worldwide:
  - the OSART (Operational Safety Review Team) of the IAEA (International Atomic Energy Agency) performs reviews at the request of the French government with the objective of formulating recommendations and promoting best practices. In 2020, there was no OSART following the IAEA's decision to postpone the one at Paluel until September 2021 due to the Covid-19 health crisis;
  - the international "peer review" inspections carried out by the WANO (World Association of Nuclear Operators) are organised at the request of EDF to assess safety performance compared to best international working practices. In 2020, there were 2 Follow-Up [3] missions (Corporate DPN and Civaux) and 4 peer reviews (Saint-Laurent, Gravelines, Penly, Golfech).

(1) See the press release dated 29 October 2020 "EDF readjusts the costs of its *Grand Carénage* refurbishment programme".
(2) This does not include any subsequent lockdown or other restrictive measures affecting activity.
(3) Follow-up missions related to the recommendations issued during peer-review audits (and detailed in an audit report).

Whistleblowing system

In the event of an accident, a crisis plan is in place to limit impacts on the environment and people, and to ensure the safety of the facility. This crisis system is based on two closely coordinated plans, designed for both local and national use. These are:

- the Internal Emergency Plan for each nuclear site, developed by EDF;
- the Special Intervention Plan, prepared by French prefectures in collaboration with the French government and EDF.

In order to provide greater effectiveness, these plans in particular take into account external risks (flooding…) and internal risks (fire…). The relevance of the system for warning, informing and protecting people is regularly assessed through accident simulation exercises. Each year, approximately 100 exercises are organised for the entire French nuclear fleet, *i.e.*, approximately one drill every three days. Approximately ten exercises are on a national level, under the management of the ASN and involve EDF and the public authorities, in particular the prefectures. In 2020, 10 nationwide drills were organised including 2 to support CGN operators (China) and ESKOM (South Africa).

After its initial analyses following the Fukushima accident in March 2011, EDF supplemented its crisis management organisation with a national team capable of quickly delivering material and human assistance to a site in great difficulty. This system, called the Nuclear Rapid Action Force (FARN), has had many simulation exercises from regional bases located at Civaux, Paluel, Dampierre and Bugey and can be sent to a unit at any site in difficulty. The FARN is capable of a simultaneous response at six units on a single site.

Significant events regarding safety

The operational safety of nuclear facilities is taken into consideration from the initial design stage, and is regularly monitored, together with the implementation of an employee motivation policy and large-scale investment programmes. The Group's nuclear safety policy is incorporated into training for both EDF employees and subcontractors.

In France, the safety of nuclear facilities is controlled by the ASN. Events are classified on a scale from one to seven, with seven being the most serious, called the INES scale [(1)]. Incidents of no consequence for nuclear safety are called "level 0 events". Since the establishment of a scale of this kind in France in 1987, no level 3 event (serious incident – very low external emission, and exposure of the public representing a fraction of regulatory limits) or above has occurred in the French nuclear fleet.

As in 2019, no major safety or radiation protection events were recorded in France in 2020. EDF's Nuclear Generation Division in France declared 736 significant safety events (SSEs) in France, an improvement on the 762 SSEs declared in 2019. Only one level 2 SSE (compared to 3 in 2019) and 83 level 1 SSEs (compared to 86 in 2019) were declared.

The number of automatic reactor trips (ARTs) improved significantly, with 0.24 ARTs per reactor over a 12-month sliding period (0.53 in 2019; 0.31 in 2018; 0.38 in 2017).

The 2020 detailed results on nuclear safety are published in the annual report created by the General Inspector for Nuclear Safety and are available on the Internet.

Radiation protection

The mobilisation of ground players has allowed a continuous improvement of performance on the protection of employees against the effects of ionising radiation. Thus, the average annual collective dose of all workers, both employees of EDF and outside companies intervening in power plants, has been halved in less than ten years.

In 2020, the average collective dose was 0.61 man-sievert per reactor. The average individual dose (EDF and contractors) remained below 1mSv (0.91mSv). The hourly dose remained stable throughout the year and was the second-lowest achieved for the fleet, with 5.45µSv per hour worked in controlled areas.

EDF is proactively implementing an ALARA (As Low as Reasonably Achievable) policy to limit the collective dose in parallel with an increasing workload involved in the industrial project on the fleet in operation. EDF is furthermore committed to continuing to lower exposure to radiation below the regulatory limit of 20mSv over 12 rolling months for the whole body. Accordingly, throughout 2020 and over 12 rolling months, no participant (among the EDF employees and contractors) was exposed to an individual dose of higher than 14mSv.

In the coming years, given the levels already achieved, efforts will have to be focused on power plants with the poorest dosimetric results, in particular by cleaning their circuits.

Regulatory notice

Regulations on radiation protection

In France, nuclear activities that present a risk of exposing persons to ionising radiation are regulated by two separate sets of rules, depending on the category of persons to be protected.

Regulations on the basic protection of the population against such radiation, which are governed by the French Public Health Code, are primarily based on all nuclear activities being subject to a declaration, registration or authorisation. Authorisations granted to establish a Basic Nuclear Facility serve as the authorisation required under the French Public Health Code. Article R. 1333-11 of the French Public Health Code sets the maximum exposure level of the general public at 1mSv per year.

French regulations on the protection of workers against the dangers of ionising radiation, which are governed by the French Labour Code, lay down various obligations for employers of workers who are likely to be exposed.

1.4.1.1.2.3 The challenges specific to the nuclear activity

A - Nuclear fuel cycle and related issues

The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it.

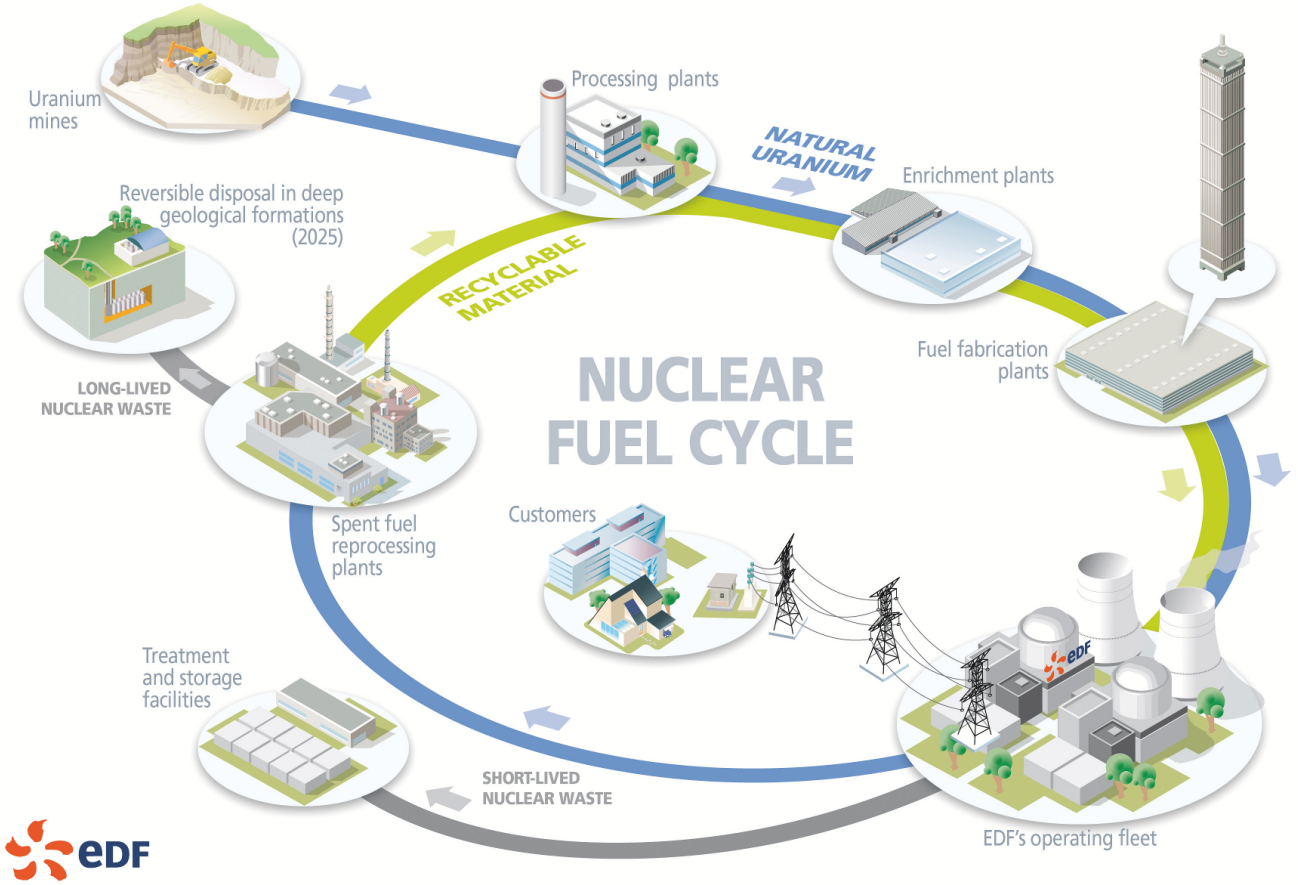
The cycle can be broken down into three stages:

- front-end (upstream), corresponding to the purchase of concentrates from uranium ore, fluorination (or conversion), enrichment and production of fuel;
- the core cycle, corresponding to the use of fuel in the reactor: receipt, loading, operation and unloading; the fuel stays four to five years in the reactor;
- back-end (downstream), for the reactor fleet in France: interim pool storage, reprocessing of spent fuel, conditioning of radioactive waste and recycling of reusable materials, the intermediate storage of treated waste prior to storage.

EDF coordinates all the operations in the fuel cycle. Generally speaking, upstream and downstream operations are carried out by subcontractors or suppliers, generally on the basis of multi-year contracts. EDF acquires most of the raw materials as uranium concentrates (U_3O_8), with transformation into more processed products carried out by industrial operators through service contracts (fluorination, enrichment and production). As the owner in most cases, EDF provides core cycle operations and is responsible for the fuel and materials it uses throughout all different stages of the cycle.

(1) International Nuclear Event Scale.

Stages of the nuclear fuel cycle in France



Upstream

To ensure the continuity and security of the supply of its reactors in France and the UK, EDF retains overall control of all operations at each stage of the cycle, through a portfolio of contacts and by stockpiling at different stages of the front-end stage of the fuel cycle (natural uranium, fluorinated enriched or unenriched uranium, and warehousing of new assemblies).

Orano is, in this respect, an important supplier (see section 2.2.4, "Operating Performance – 4E Operational continuity of supply chains and contractual relations").

Natural uranium supply

EDF's uranium supplies are guaranteed by long-term contracts for periods of up to 20 years with a policy of diversification in terms of sources and suppliers. Indexation formulas for portfolio contracts of natural uranium supply include fixed prices (base prices whether inflated or not) and variable prices (indexed according to market price indexes) and are sometimes limited by floor and ceiling prices. Consequently, the effects of fluctuations in market prices of natural uranium on supply costs are limited. Where necessary, the Group implements a strategy of currency hedging for its uranium supplies.

EDF is making sure to implement best practices in mineral extraction so as to contribute to making overall progress in this sector. Since 2011, EDF has conducted mine audits based on a method drawn up collaboration with the World Nuclear Association (WNA) (see section 3.4.2.3.3 "Coal and uranium supply chain").

Fluorination (or conversion)

EDF's needs are covered by Orano in France, as well as other international producers such as Cameco in Canada, Converdyn in the United States and Tenex in Russia.

Enriching natural uranium into uranium 235

EDF meets its enrichment needs through global enrichers Orano (France), Urenco (UK, Germany, the Netherlands, the United States) and Tenex (Russia), primarily through fixed-price contracts.

Enriched reprocessed uranium

Since the 1990s, reprocessing has made it possible to recycle within the reactors uranium from processing spent fuel, which represents approximately 95% of the spent fuel mass. Reprocessing was suspended in 2013, pending the availability of a new industrial scheme. In 2018, the Board of Directors approved the restart of a robust, competitive and efficient sector, with the first assemblies planned to be loaded in 2023, subject to technical changes made and the necessary authorisations obtained from the safety authority. The corresponding contracts were signed with the respective suppliers in 2018. Pending the effective restart of the sector, the reprocessed uranium is stored in a stable form.

Fuel assembly manufacturing

EDF has two sources of fuel assemblies: one is internal, *via* its Framatome subsidiary, while the other is external, the main external supplier being Westinghouse.

The first fuel assemblies were delivered for the Flamanville 3 EPR reactor in 2020; these deliveries will continue in 2021.

Fuel supply of the two EDF reactors at Hinkley Point (United Kingdom)

In September 2016, EDF, Orano and Framatome entered into an agreement providing for the supply of uranium, conversion and enrichment services, and assembly manufacturing for the fuel supply of the Hinkley Point C reactors.

Downstream

Regulatory notice

As the producer of the waste, EDF is responsible for what happens to its spent fuel and how it is processed and for the related waste, without any possibility of transfer of responsibility or limitation in time. Orano is responsible for processing spent fuel and ANDRA for the management of the long-term storage of final waste, in accordance with the Codified Law of 28 June 2006 on the long-term management of radioactive materials and waste.

Management of radioactive and non-radioactive waste is governed by Articles L. 541-1 *et seq*. of the French Environment Code.

EDF's current strategy for the nuclear fuel cycle, in agreement with the French government, is to process spent fuel and wherever possible recycle substances such as plutonium separated in this process in the form of MOx fuel. The quantities handled are determined by the amount of recycled plutonium in reactors allowed to load MOx fuel ("equal flows" principle). The recycling capacity of nuclear units in the French fleet has allowed the processing of around 1,100 tonnes of spent fuel per year.

In addition, and in anticipation of the storage needs of the nuclear generation fleet, EDF is currently working on the design of a large spent fuel storage pool. This will make possible the long-term storage (for around 100 years) of spent MO_x and ERU fuel from PWRs and from fuel assemblies of the Superphénix fast-neutron reactors, currently stored in the spent fuel storage pool at the Creys-Malville power plant pending multi-recycling in third-generation pressurised water reactors, or recycling in fourth-generation reactors (Gen IV). The French National Plan for the Management of Radioactive Materials and Waste (PNGMDR) for 2016-2018 identified the need for additional spent fuel storage capacity by 2030; in the light of this, it also required EDF to lodge a request for permission to create one by 2020.

With a view to the fifth edition of the PNGMDR (National Plan for the Management of Radioactive Materials and Waste), France's *Commission nationale du débat public* (National Public Debate Commission) organised a debate from 17 April to 25 September 2019. Taking into account the completion of this public debate and related debates led EDF to postpone its schedule for filing a construction permit application. Following this debate, the Ministry of Ecological and Solidarity Transition and the ASN, the contracting authorities for the PNGMDR, published their findings in the form of a ruling dated 21 February 2020 noting in particular "*the continuation of the work relating to the implementation of new centralised underwater storage capacities*" and "*the changes in the regulatory framework applicable to the management of very low-level waste (VLLW)*".

As part of preparations for this fifth edition, on 21 September 2020 the Ministry of Ecological Transition launched a post-public debate consultation until 8 March 2021, supervised by independent guarantors appointed by the National Public Debate Commission.

In a separate development, the Ministry of Ecological Transition launched a public consultation from 4 January to 4 February 2021 on regulatory changes applicable to the management of VLLW, with a view to enabling a new option for targeted exemptions, after fusion and decontamination, with a view to reprocessing and re-using very low-level radioactive metal waste on a case-by-case basis.

Following the favourable examination of the safety option file (DOS) and the opinion issued by the ASN on 23 July 2019, EDF now has the fundamentals required to pursue its project, suggest a site for its location, and engage the relevant public consultation project. Following this consultation, EDF will be able to file the construction permit application for the facility. After work carried out at the site in question, EDF now favours a location at La Hague (Manche), close to Orano's industrial site. EDF plans to pursue its project by approaching the National Public Debate Commission in early 2021, so as to be in a position to file the construction permit application before late 2022 and have the facility commissioned in 2034.

As regards the PNGMDR more generally, a multi-party working group ("Orientation Committee") tasked with defining the strategic orientations of the main topics of the next plan was formed in 2020. A post-public debate consultation is associated with the work on these orientations.

Processing of spent fuel from EDF's nuclear power stations

Spent fuel awaiting processing is temporarily stored underwater in cooling pools, first in pools at the plants and subsequently in those of Orano's reprocessing plant in La Hague. The storage conditions are recognised as being safe over a century-scale period of time. Approximately ten years after the spent enriched natural uranium fuel has been unloaded from the reactor, it is processed to separate the recyclable products from waste. The waste is subsequently conditioned and temporarily stored at the La Hague site in specific premises.

The relationship between EDF and Orano concerning the transport, processing and recycling of spent fuel was formalised for the 2008-2040 period by a framework agreement signed on 19 December 2008. In February 2016, EDF and Orano signed an implementation agreement covering the 2016-2023 period as well as the associated supply contracts for the MO_x assemblies.

Storing conditioned ultimate waste

Radioactive waste, depending on its nature, level of radioactivity and the lifespan of its radionuclide components, has been classified into different categories: from High-Level Waste (HLW), to Very Low-Level Waste (VLLW) passing by Low-Level Waste (LLW) and Intermediate-Level Waste (ILW). It is called Long-Lived (LL) when it remains active for more than 31 years.

Long-Lived High-Level Waste (HLW-LL)

The processing of spent fuel enables the vitrification of HLW-LL, which provides very high-quality conditioning with a reduced volume. The waste is then temporarily stored at La Hague in specific facilities. For example, all of the Long-Lived High-Level Waste produced in this way, corresponding to the operation of the early plants and to 50 years of operation of the current PWR facilities, would represent a volume of approximately 9,300 cubic metres (the electricity consumption of one million people for one year generates approximately 3 cubic metres of HLW-LL).

Long-Lived Intermediate-Level Waste (ILW-LL)

The structures of the assemblies (shells and nozzles, clad pieces, etc.) separated during the processing of spent fuel, constitute ILW-LL. They are currently compacted and conditioned in stainless steel containers. ILW-LL waste also results from certain operating, maintenance and dismantling activities. For example, the total volume of ILW-LL waste, including in particular the waste from the operation and decommissioning of shut down facilities, including Uranium Natural Graphite Gas reactors and the waste from the current PWR facilities, taking into account the 50-year operating life of the power plants and the decommissioning operations, would represent about 37,000 cubic metres. It generates less heat compared to HLW-LL and thus is suitable for faster storage than HLW-LL because it does not require cooling.

HLW-LL and ILW-LL from the reprocessing of spent fuel is temporarily stored in dedicated facilities in La Hague, pending the implementation of the storage in deep geological layers, as is currently envisaged as part of ANDRA's Centre industriel de stockage géologique (Cigéo) project. The Cigéo project is also the French deep geological storage facility project for ILW-LL and HLW-LL radioactive waste. It is designed to store highly radioactive and long-lived waste produced by all current French nuclear facilities until their decommissioning, and by the processing of spent fuel used in nuclear power plants. After 15 years of research, evaluation and public debate, the principle of deep geological storage was adopted by the French Law no. 2006-739 of 28 June 2006 on the sustainable management of radioactive materials and waste as a safe long-term solution to manage this type of waste without shifting the burden onto future generations.

The centre is to be located in the east of France at the border of the Meuse and Haute-Marne departments. Cigéo will consist of surface facilities that will be used to receive and prepare waste packages as well as to excavate and build the necessary underground structures. The waste will be stored in underground facilities some 500 metres below ground in an impermeable argillaceous rock formation able to contain radioactivity over very long periods (several hundreds of thousands of years). Cigéo is designed to operate for at least 100 years and provide flexibility in order to give future generations a maximum number of possibilities to adapt it as needed.

The codified law no. 2016-1015 of 25 July 2016, which specifies the details of the creation of a reversible deep storage facility, represents the fulfilment of an important prerequisite before obtaining approval of the Cigéo project for the management of HLW-LL, ILW-LL radioactive waste. ANDRA is continuing its design studies, as well as appropriation and optimisation work, with a view to an application for permission to build the facility being submitted by the end of 2021. The dossier for the public interest declaration application was filed by ANDRA with the public authorities in August 2020.

ANDRA's baseline schedule calls for a pilot industrial phase by 2030, followed by the start of delivery of the first waste (at this stage, the baseline for producers is still for intake of the first waste packages in 2031). It should be noted that if this date were to be delayed by a few years, this would not have a significant impact on our capacity for storing the waste in question beforehand, or on the financial amounts to be provisioned at present value.

On 15 January 2018, the ASN gave its opinion on the DOS (list of safety options) submitted by Cigéo in which it considered the project had on the whole reached a satisfactory technological maturity at that stage. The ASN's draft opinion requires that alternatives to storing bituminous waste untreated at Cigéo be studied. In September 2019, the expert panel instructed by DGEC in September 2018 to review the management of bituminous waste concluded that in principle, various handling options were feasible (storage or neutralisation), whilst emphasising the importance of further research to identify the most appropriate option. A four-party research programme between producers and ANDRA is already in progress on this issue.

Cigéo's detailed design studies are being finalised by ANDRA. The detailed design review, organised at the request of the DGEC (French General Directorate for Energy & Climate) by a group of independent experts, reported its findings in October 2020. Whilst issuing a mostly positive opinion on the dossier submitted by ANDRA, it expressed a certain number of recommendations for the finalisation of the detailed design studies and the construction permit application file, calling for even closer partnership between EDF, Orano, and the French Alternative Energies and Atomic Energy Commission (Commissariat à l'énergie atomique et aux énergies alternatives, CEA) in this work.

As regards the tax status of Cigéo, Article 127 of France's 2021 Finance Act has made a change to the taxation regime for BNFs under Article 43 of the 2000 Finance Act; rather than taxation based on ordinary law, they will now be taxed on the basis of a storage tax. The related provisions have yet to be defined and framed by the government.

Long-Lived Low-Level Waste (LLW-LL)

LLW-LL comes from the decommissioning of the old NUGG reactors (graphite, processing waste – see section "Decommissioning of nuclear power plants"). The law of 28 June 2006 provides for a specific near-surface storage for this waste. In July 2015, ANDRA transmitted a report on the feasibility of a storage centre on a site located in the Soulaines region (Aube) in France for an opinion from the ASN. Work is currently ongoing, as part of the national plan for the management of radioactive materials and radioactive waste (PNGMDR) to identify the waste that could be taken on. Furthermore, studies conducted by EDF to characterise more precisely the radiological inventory of this waste have led to significant gains. As a result the possibility of storing part of the graphite (particularly that of the Chinon A2 reactor) in existing surface facilities can be reconsidered.

ASN opinion 2020-AV-0357 dated 6 August 2020 on the studies relating to the management of LLW-LL, issued following the work conducted between 2016 and 2018, as well as the orientations suggested by the contracting authorities for the PNGMDR in the current phase of development of the fifth edition of the plan, suggest a precise schedule for the next stages to enable the consolidation of the management strategy for this particular waste.

These specify the following by 2023:

- definition by Andra of several baseline management scenarios; these will be presented to the PNGMDR working group in order to highlight the management options that may be envisaged, including using existing options such as the storage centre in Aube, decentralised storage, Cires (VLLW storage centre) and the requirements for additional concepts;
- production of a dossier (with a level of maturity corresponding to a summary preliminary draft) presenting the technical and safety options chosen for LLW-LL storage for an inventory of waste to be proposed by the agency, on the Vendeuvre-Soulaines site. To draw up this dossier, Andra will take into account the possibility of staggering the construction of this storage by constructing independent units to suit each type of waste, with implementation in a range of campaigns suitable for different families of waste.

They also show that should new storage sites be envisaged, in application of this management scheme, Andra will initiate a procedure for identifying sites and carrying out feasibility studies, followed by design studies, for these sites. If this management option is confirmed for the Vendeuvre-Soulaines local authorities' storage site, Andra will submit a safety options file for the deployment of a LLW-LL repository, with a level of maturity corresponding to a detailed preliminary draft, five years after the ASN opinion on the report submitted covering the safety options file (*i.e.* in around 2028).

Although this procedure does not yet provide any clear visibility as to the date of availability of waste removal sites, it will enable information from ANDRA to be available in 2022-2023 with regard to the management solutions that can be envisaged, and for these to be implemented within a timeframe compatible with the extraction of the graphite bricks from the reactors, maintaining two main options for graphite from the lead reactor (LLW-LL or the Aube repository (CSA)). The scenario currently modelled in the provisioning for the first graphite piles from Chinon A2 extracted in around 2040 is for them to be stored at CSA. The risk of construction of temporary storage at Chinon was also taken into account. All the provisions also cover the scenario of direct storage in a modular subsurface LLW-LL repository.

Short-Lived Low- and Intermediate-Level Waste (LILW-SL) and Very-Low-Level Waste (VLLW)

Short-Lived Very Low-, Low- and Intermediate-Level Waste comes from the operation of nuclear facilities (gloves, filters, resins, etc.) and their decommissioning (concrete, scrap, lagging, piping, etc.). They are stored above ground in the Soulaines and Morvilliers storage facilities run by ANDRA in the Aube département.

In order to minimise volumes, some waste is treated beforehand by melting or incineration at the Centraco plant owned by Cyclife France (now part of Cyclife Holding, a subsidiary of EDF). In 2016, following the acquisition of the English and Swedish assets of Studsvik, the holding company "Cyclife" was created. The goal is to group together all recently acquired assets and establish the development of the Group's internal and external activities in terms of waste treatment and decommissioning. To this end, in 2019, the Cyclife Engineering and Graphitech [(1)] subsidiaries were set up. They have been tasked with developing decommissioning solutions for various technologies (in the main, Cyclife Engineering handles light water reactors and waste processing installations, while Graphitech deals with graphite reactors).

At 30 September 2020, Cyclife Holding also holds an 84.6% stake in Cyclife Digital Solutions, which specialises in tools and digital simulation used for decommissioning, and waste management.

In addition, following the PNGMDR public debate, in line with the joint ruling by the Ministry of Ecological Transition and the ASN, contracting authorities for the PNGMDR to work on a "*change in the French regulatory framework applicable to the management of very low-level waste (VLLW)*", EDF is continuing to develop its industrial base, working in particular on a planned "technocentre", to include cutting and fusion facilities, for the processing and reuse of metal VLLW from decommissioning in France and abroad.

EDF also conducts both its own R&D activities and R&D with a network of partners (nuclear operators, manufacturers, VSBs and SMEs, institutional and academic players), on the twin themes of the management of radioactive waste and decommissioning. EDF is a recognised leader in these fields and is taking part in seven EU projects to improve the performance of waste management and decommissioning projects, develop its expertise, and contribute to the development and implementation of the best international practices.

Consideration of future charges relating to the management of spent fuel and long-term management of radioactive waste

Each year, EDF makes provisions for the downstream side of the nuclear fuel cycle in France (see note 15 of the appendix to the consolidated financial statements for the year ended 31 December 2020 in section 6.1).

(1) Owned jointly by EDF and Veolia.

B - The challenges specific to preparing for the future of the nuclear fleet in France

EDF's industrial goal for the preparation for the future of the nuclear fleet rests primarily on the following strategic areas:

- the implementation of technical conditions allowing the extension of the operational life of nuclear power plants beyond 40 years;
- continued safety improvements, primarily by integrating lessons learned from the Fukushima accident in Japan;
- implementation of a preventive policy with respect to ageing or obsolete equipment.

Continued operation of the operating units after 40 years

Additional Safety Assessments (ASA) following the Fukushima accident

On 15 September 2011 and in light of the accident at the Fukushima nuclear plant in Japan, EDF submitted 19 Additional Safety Assessment reports to the ASN, at its request, one for each of its nuclear sites, encompassing all its existing reactors and all those under construction.

These assessments consisted of re-examining the defences of existing power plants and those under construction, in light of the events in Japan, taking into account issues set out in the specifications drafted by the safety authorities.

Thus, the safety margins were reassessed against the risks of earthquakes and flooding, when dealing with situations of simultaneous loss of the cooling source and power supplies and the consequences of severe accidents.

These assessments also led to inquire whether certain changes to the scenarios planned beyond situations used for the sizing of the protection systems, would lead to a worsening of the consequences in terms of safety ("cliff effects"). They finally led to deterministically consider the extreme situations that substantially exceed those used in the design of nuclear installations and subsequent safety reviews.

The safety of EDF's nuclear fleet is based on the principle of continuous improvement: existing and new facilities continuously benefit from feedback from all power plants, and lessons are learnt from incidents and accidents that may occur in the world.

Finally, the ASAs also re-examined the rules applied in outsourcing.

These analyses confirmed first and foremost the adequate level of security throughout the EDF nuclear power fleet, particularly because of the periodic reviews carried out in France since the end of the 1980s. EDF also proposed additional measures to the ASN that exceed those considered for sizing safety systems, to contribute to further improving the current safety level of power plants.

In its opinion to the government published on 3 January 2012, the ASN states, on the basis of the analyses of its technical support, that "*after the additional safety assessments on priority nuclear facilities, the ASN considers that the facilities examined show an adequate level of safety, and that it will not thus request the immediate shutdown of any of them*". At the same time, the ASN considers that "*continuing to operate these facilities requires increasing their robustness, as soon as possible, to an extent beyond existing safety margins, to handle extreme situations*".

The ASN also recommended the "hard core" concept and the FARN system (see section 1.4.1.1.2.2 "Environment, nuclear safety, radiation protection"). The "hard core" will be made up of the plant's structures, systems and components that can withstand situations studied in connection with ASAs. On 26 June 2012, the ASN made 19 decisions requiring EDF to follow over 600 technical requirements, which set regulatory requirements according to the post-Fukushima action plan. These technical rules require that all nuclear sites must have an organisation and local crisis centres resistant to the occurrence of a large-scale event affecting several facilities.

For EDF power plants, the prescribed "hard core" must in particular have "bunkerised" electrical resources in each unit. In the meantime, a temporary back-up diesel generator was installed at each of the 58 units in 2013. The complete definition of the "hard core" was covered in technical rules issued by the ASN in January 2014.

Operating life of EDF's PWR fleet

The provisions of the French Environment Code do not set a limit on operating life but require a review of facilities every ten years in light of applicable rules and updates of assessments of the risks facilities pose to protected interests, taking into account the state of the facilities, the experience gained during their operation, new developments in nuclear science, and rules applying to similar facilities (safety standards).

EDF's industrial strategy is to operate the fleet beyond 40 years in the best conditions of safety and performance, considering the significant investment linked to the third ten-year inspections and the post-Fukushima improvements on the one hand, and the energy needs of France on the other. This target is consistent with trends observed around the world for reactors using similar technologies. To this end, EDF has implemented industrial and R&D action plans. Actions have been launched to renew the major components that can be renewed and solutions are being studied to demonstrate the capacity of non-replaceable equipment such as the confinement containment building and reactor vessels, to ensure their operation up to 60 years.

An extension to the life of the current nuclear fleet would enable, whilst respecting the absolute priority of nuclear safety and as part of the multi-year energy programme, better use of the industrial base it represents and the spreading of the commissioning of new plants over time.

In the first half of 2016, all the technical, economic and governance conditions necessary to match the amortisation period of the 900MW power plants in the French nuclear fleet with the Group's industrial strategy were met. On 28 July 2016, the Board of Directors of EDF approved the extension of the accounting amortisation periods of PWR 900MW series power plants in France (excluding Fessenheim) from 40 to 50 years from 1 January 2016 onwards, without prejudice to the ASN's position on the measures suggested by EDF for each of the nuclear units in question.

It is based on the technical capacity of the PWR 900MW fleet facilities to operate for at least 50 years, supported by international benchmarks, as well as by the investments made progressively under the *Grand Carénage* programme (see section 1.4.1.1.2.1 "Investment programme for the existing nuclear fleet in France"). These investments will enable the PWR 900MW series to reach a level of safety as close as possible to that of the EPR, and one of the highest internationally, after its fourth ten-year inspection (VD4).

On 23 February 2021, the ASN ruled on the terms for continuing to operate 900MW reactors beyond their fourth scheduled inspection. The ASN "*deems that the measures put forward by EDF, coupled with its own recommendations, open up the way for the continued operation of 900MW reactors for ten years after their fourth regular re-examination*".

Tricastin 1 was the first 900MW reactor unit to successfully undergo its fourth ten-year inspection (VD4). It was decoupled on 1 June 2019, and diverged at the end of its ten-year inspection on 19 December 2019.

The extension of the operating life of the 900MW units will be implemented according to the multi-year energy programmes for 2019-2023 and 2024-2028.

The amortisation period of the other series of France's nuclear fleet (1,300MW and 1,450MW), which are more recent, currently remains at 40 years, because the conditions for an extension have not been met. The subsequent extension of the most recently installed reactors in the French nuclear fleet is at the heart of the Group's industrial strategy.

Decommissioning of nuclear power plants

EDF takes full regulatory, financial, and technical responsibility for the decommissioning of its plants and the other nuclear installations it operates (including BCOT, St Laurent Silos, and ICEDA). EDF has taken steps to ensure that throughout decommissioning, it controls the entire life cycle of nuclear power generation resources.

Regulatory notice

Regulations applicable to the decommissioning of nuclear facilities

The decommissioning of a BNF is ordered by a decree, issued after an opinion by the ASN and completion of a public enquiry. This decree determines the characteristics of the decommissioning, the timeframe for its completion, and where applicable, the operations incumbent upon the operator after decommissioning.

The reference scenario adopted by EDF since 2001 is for decommissioning without a waiting period, consistent with French regulations, which provide for decommissioning "in as short a time as possible" after final shutdown on acceptable economic terms and in line with the principles set out in Article L. 1333-2 of the French Public Health Code and Article L. 110-1 II of the Environment Code (see Article L. 593-25).

The regulatory process for decommissioning involves the following:

- a final shutdown declaration, to be made at least two years prior to the planned shutdown date;
- a decommissioning request resulting, following examination by the authorities and a public inquiry, in a decree allowing for decommissioning;
- key progress reviews with the ASN, included in a safety reference system relative to dismantling;
- finally, once the work and final shutdown have been completed, the declassification of the facility to remove it from the legal regime governing basic nuclear facilities.

Decommissioning of shut down power plants

The power plants in question that have been permanently shut down are a heavy water reactor (HWR) at Brennilis; a fast-neutron reactor (FNR), Superphenix; the industry's six natural uranium graphite gas reactors (NUGG) in Bugey, Saint-Laurent, and Chinon, and three pressurised water reactors (PWR): one in Chooz A and those at the Fessenheim site.

The sites remain the property of EDF, and they will remain under its responsibility and monitoring. Given its role as responsible operator, EDF will act as the contracting authority for the decommissioning.

EDF plans a period of 15 years for the decommissioning of Pressurised Water Reactors.

The decommissioning of EDF's historic nine first-generation units in final shutdown ("first generation" programme) will produce approximately one million tonnes of primary waste materials, of which 80% is standard waste material and none is High-Level Waste. The remaining 20% comprises Very-Low to Intermediate-Level Waste including about 2% Long-Lived Waste requiring the availability of a storage facility for ILW-LL and LLW-LL. Decommissioning of the two Fessenheim reactors shut down in 2020 will produce 380,000 tonnes of waste, 95% of which will be non-radioactive waste.

The existing means of removal of short-lived VLLW and LILW have been supplemented by the Installation de conditionnement et d'entreposage des déchets activés (Conditioning and Storage Facility for Activated Waste, ICEDA) for the conditioning and storage of activated waste from operations and decommissioning (ILW-LL) located on the Bugey site (the commissioning of which was authorised by the ASN on 30 July 2020);

The scheme for handling waste from decommissioning still needs to include the construction of the LLW-LL repository (see the paragraph on LLW-LL in section 1.4.1.1.2.3 "Nuclear fuel cycle and related issues"). Moreover, the new dismantling schedule of the NUGG plants provides for the construction of a storage facility for the LLW-LL liners of the silos at Saint-Laurent, pending the availability of a definitive disposal route (first removal of graphite in 2044).

2020 was impacted by the Covid-19 health crisis, which affected all the decommissioning works in progress; these were stopped for a period of 3-4 months (with varying degrees of impact on the critical path of these projects).

Chooz A: deconstruction of the Chooz A plant is continuing to schedule with cutting and extraction of the internal components of the reactor vessel (following the filling of the reactor pool in 2018). However, the interruption of worksites during the lockdown phase resulted in extensive growth of organic matter, worsening the turbidity of the pool between March and July. This required the implementation of new, more cumbersome treatment solutions, causing a further suspension of internal component cutting operations. The estimated delay for the critical path of the project is between 15 and 18 months.

Chooz A is a pressurised water reactor using a technology similar to the 58 units in operation, but of an older design. This design makes effective treatment of the water in the pool difficult. It was commissioned in 1967 and operated until 1991 (final ending date for power generation). The reactor location, in a rocky cave in a hillside, means that access conditions and entry and exit of materials and effluent management are more difficult than those of the rest of the existing PWR fleet.

Creys Malville: following the filling of the Creys-Malville reactor vessel at the end of 2017, the decommissioning process continued with the remotely operated cutting of the core cover cap, followed in June 2020 by the start of decommissioning of the internal components of the reactor vessel.

Brennilis: pursuant to a 2008 agreement [(1)] with the CEA, EDF has become fully responsible for the decommissioning of this facility [(2)]. The deconstruction works included in the scope of the Decree authorising partial decommissioning were finalised by end-2020. The safety concrete for the effluent processing station has been demolished, and the spoil removed. Following the final inspections, decommissioning works to allow this zone to be relisted as a conventional zone were undertaken. At the same time, examination of the decommissioning dossier (filed in 2018) with a view to the publication of a full decommissioning decree (allowing decommissioning of the reactor block itself) is ongoing, with a public enquiry planned for the end of 2021.

NUGG: the industrial strategy of the dismantling of the NUGG reactors was thoroughly reviewed at the end of 2015 with the shift from "in-water" dismantling to "in-air" dismantling. This alternative combined with the newly proposed sequencing of operations took into account the results of the 2013-2015 pre-project studies. They show a prolongation of the operations to dismantle the caisson (about 25 years instead of 10 as originally planned), by completely dismantling an initial series unit before dismantling the other 5 units. Updating the industrial decommissioning scenario for first-generation power plants, particularly NUGG plants, led to a €590 million increase in the provision at 31 December 2015.

The new dismantling strategy was presented to the ASN's Audit Council in March 2016. At the ASN's request, a group of independent experts was commissioned to assess the robustness of the proposed dismantling whose chief features were confirmed.

The NUGG strategy file, the safety option report for the reactors, and the detailed timetable for operations over the 2017-2032 period were sent to the ASN in 2017. These provided supporting grounds for the technical options adopted, in particular the decommissioning sequencing for the six reactors:

- construction of an industrial demonstrator to test the tooling to be used during the "in-air" dismantling of the first caisson;
- realisation of an "in-air" dismantling of an initial series unit before engaging in the industrial dismantling of the other NUGG reactors;
- for the other caissons, carry out before 2035 the work to develop a secure configuration after electromechanical dismantling and the demolition of the peripheral buildings and structures (reactor buildings, pool hall, etc.); some will be carried out in advance in regard to the previous scenario.

This scenario forecasts an initial removal of the graphite from the first NUGG reactor by 2044 and pushes back the need for a disposal route for the other graphite waste by 2070.

(1) With this agreement the CEA has become fully responsible for the decommissioning of Phénix.

(2) French Decree no. 2000-233 of 19 September 2000.

In 2018 and 2019, the ASN investigated the dossiers submitted by EDF and made available to the public for consultation between 11 July and 12 November 2019: these draft decisions called for works to start from 2055 onwards, with the exception of "TTS" lead units. The provisions relating to decommissioning of NUGGs were updated on 31 December 2019 in order to take these draft decisions into account. In its opinion of 18 October 2019, the IRSN stated that *"the schedule is based on more realistic time frames than those underpinning the previous strategy. The most recent studies provide additional insights into the complexity of the operations to be undertaken."*

The ASN rulings published on 17 March 2020 have established a prescriptive framework for the operations and dossiers to be completed within the next 5-7 years on each of the sites. Unlike the aforementioned draft rulings submitted for public consultation, these defer the issue of the schedule for operations until the investigative phase for dossiers relating to decommissioning.

However, in a cover letter accompanying these rulings dated 13 March 2020, the ASN deems that EDF should attempt to significantly shorten the schedule for completing the operations "*in view of the statutory obligation to decommission each reactor in as short a time as possible*". EDF confirmed the implementation of a regular review of the schedule based on the results obtained on the industrial demonstrator and the first reactor.

In connection with its subsidiary Graphitech, EDF is working on avenues for schedule optimisation that should make it possible to include a schedule similar to that of the draft ruling submitted for public consultation in the dossiers filed in 2022 (decommissioning of reactors other than "TTS" lead units from 2055 onwards). Consistently with these works, and in the absence of any further information from tests using the industrial demonstrator and the first real-life operations, there was no change in 2020 to the valuation of the estimated provisions at the end of December 2020.

On 20 November 2020, an ASN exploratory procedure designed to verify the maturity of EDF for running complex projects was completed. The Graphite Industrial Demonstrator (DIG) and Chinon A2 projects were inspected by a team comprising members from the ASN, IRSN, and DGEC. The draft follow-up letter was received on 18 February 2021, describing the ASN's satisfaction in respect of the way the overall procedure had been carried out, the identified strengths, and the areas for improvement that had been noted. All of the requests are being examined and will be discussed with the ASN in early March.

The external audit mandated by DGEC on "responsibilities in respect of decommissioning facilities currently permanently shut down and the management of radioactive waste from these facilities" commenced on 3 December 2020 for a provisional period of 6 months, pursuant to the letter of instruction received on 5 June 2020 from the General Directorate of the French Treasury (DG Trésor) and the DGEC. This audit covers legacy shut down facilities excluding PWR technology, *i.e.*, Superphenix, Brennilis, and the 6 NUGG reactors.

Fessenheim: Article L. 311-5-5 of the French Energy Code, introduced by the French Energy Transition Act promoting green growth dated 17 August 2015, caps installed nuclear power generation capacity in France at 63.2GW, thus requiring EDF to take all necessary measures to close the two Fessenheim reactors.

On 27 September 2019, EDF sent the Minister of Ecological and Solidarity Transition and the Nuclear Safety Authority the declaration of the permanent shutdown of the two Fessenheim reactors and, on 30 September 2019, a request for termination of the authorisation to operate this plant. The submission of this request and declaration follows the signing, on 27 September 2019, by the French State and EDF, of the MOU establishing the schedule of detriment issues granting entitlement to compensation and determination of the terms of this compensation. Pursuant to the French Decree dated 18 February 2020 terminating this authorisation, reactors 1 and 2 were permanently shut down on 22 February 2020 and 30 June 2020 respectively.

Pursuant to the MOU, compensation includes:

- initial payments corresponding to advance expenses arising from the closure of the plant (post-operation expenses, BNF tax, decommissioning costs, and staff redeployment costs); these will be made over a period of four years following closure of the plant;
- subsequent payments corresponding to any loss of earnings, in other words any profits that future output would have brought in, determined on the basis of the previous output from the Fessenheim power plant, through to 2041, calculated *ex post* on the basis of the sale price of nuclear power, more specifically observed market prices.

The French State decided to proceed with payment of the entirety of the fixed component, the amount of which was evaluated at €370 million (payment appropriations provided for by French Budget Act for 2020 2019-1479 dated 28 December 2019 and French Amended Budget Act for 2020 2020-1473 dated 30 November 2020). This amount may be readjusted as necessary, depending on actual post-operation expenses, BNF taxes, and staff redeployment costs.

EnBW, EDF's partner in the plant, will under certain conditions be entitled to a share of lost earnings in proportion to its contractual rights to the plant's generation capacity. For its part, the Swiss company CNP (*Centrales Nucléaires en Participations SA*) decided to end its involvement in the partnership. Once EDF took note of CNP's decision the contract between the two firms ended on 31 December 2017.

The decommissioning dossier was filed with the Minister of Ecological and Solidarity Transition and the ASN in November 2020, with the aim of obtaining the Decree prescribing decommissioning operations in 2025; this will mark the actual start of the decommissioning phase. In the meantime, the PREDEM Fessenheim project has been put into place to coordinate all the end-of-operation procedures (permanent locking-out and removal of certain equipment and support functions, removal of fuel, decontamination of primary circuits, etc.).

Decommissioning costs and assets constituted to cover long-term nuclear commitments

Since the beginning of operations at its power plants, EDF has made provisions to cover decommissioning operations, engineering, monitoring and maintenance of facilities, and site security (see section 6.1, note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020). The aim of decommissioning operations is to restore the condition of sites and enable the land to be reused for industrial purposes.

Dedicated assets have been gradually established since 1999 to cover long-term nuclear commitments (see section 6.1 "Consolidated financial statements at 31 December 2020", note 15.1.2.2 "Strategic allocation and composition of dedicated assets").

Article L. 594 of the French Environment Code and its implementing regulation specified which liabilities are not associated with the operating cycle and must therefore be covered by dedicated assets (see section 6.1 "Consolidated financial statements at 31 December 2020", note 15.1.3 "Coverage of long-term nuclear commitments").

1.4.1.1.3 New Nuclear projects

See also section 2.2.4, "Operational Performance", risk factor "4A Management of large and complex industrial projects, including EPR projects".

1.4.1.1.3.1 Flamanville 3 EPR project

EDF is both the owner and manager of the Flamanville 3 EPR (European Pressurised water Reactor) project.

Interactions with the Nuclear safety authority (ASN) and administrative authorisations

The request for application for commissioning, submitted in March 2015, has been examined once and was updated in June 2017. A file amending this request was submitted in April 2019. EDF will submit to the ASN a further update to the request for application for commissioning in the first half of 2021. A full update of the impact study has also been commenced, for submission at the same time.

On 8 October 2020, pursuant to the French Environment Code, the ASN authorised the arrival of nuclear fuel at the Flamanville EPR reactor site, after an on-site inspection on 18 and 19 August 2020 and after public consultation on the draft authorisation from 31 August to 21 September 2020. The ASN also authorised the use of radioactive gases to carry out efficiency tests on certain filtration systems. In addition, on 15 October 2020, pursuant to the French Defence Code (*code de la défense*), the Senior Civil Servant for Defence and Safety (*Haut Fonctionnaire de Défense et de Sécurité*, HFDS) authorised the holding, use, and transfer of nuclear materials for the site. The first fuel assemblies were delivered on site on 26 October 2020.

In a Decree dated 25 March 2020, the commissioning deadline specified in the Authorisation Decree (DAC) was postponed until 11 April 2024, to take into account the weld repairs whilst maintaining flexibility.

Progress of on-site implementation

2020 was marked by:

- the completion of phase 2 of the Hot Tests (EAC2) from 21 September 2019 to 17 February 2020;
- completion of the rest of the open vessel functional tests (EFCOs) from 23 May to 25 June 2020;
- completion of instrumentation & control outages in June and July 2020 and the beginning of electricity outages in July;
- the launch of upgrading of the first seven welds on the Main Secondary Circuit, five of which were completed during the year;
- opening of the Enhanced Protection Area to pedestrians between Flamanville 1&2 and Flamanville 3, on 9 September 2020;
- completion of all points required for fuel delivery;
- production of a "fire" action plan;
- preparatory work for the qualification of remotely-operated robots used for penetration weld repairs;
- management of the Covid-19 health crisis in spring 2020, on site and remotely during lockdown. Work was suspended during the first lockdown in March 2020, except for site watch and equipment conservation. Consequently, the accounting procedure to capitalise the interim interest on the project was suspended between 15 March and 1 July 2020.

Quality equipment manufacturing

By the end of 2020, almost all the equipment for the nuclear section and the conventional island, had been delivered and assembled on site.

Reactor vessel

In the first half of 2017 the ASN examined "higher-than expected" carbon levels in the vessel head and bottom on the basis of documentation submitted by Framatome, under the supervision of EDF. Based on the opinion of a group of ASN-appointed experts, the ASN issued an opinion on 11 October 2017 concluding that the mechanical properties of the vessel head and bottom head were adequate for their uses, including in the event of an accident. On 9 October 2018, the ASN authorised:

- the commissioning of the vessel bottom, subject to functional checks;
- the commissioning of the vessel head, by limiting the lifespan to 2024, unless the technical feasibility of checks is proven to be similar to the vessel bottom.

In 2020, EDF halted the project to develop inspection of the vessel head during service, the aim of which was to make it possible for a proposal to be made to the ASN to keep the existing head, subject to the industrial feasibility of this type of operation. The project is now focused on replacing the vessel head by the end of 2024, the supply of a new equipped vessel head having been ordered from Framatome.

Consequently, the costs incurred for the manufacture of a replacement vessel head are not included in the target construction cost. Furthermore, arbitration proceedings have been engaged with respect to this matter by EDF, AREVA SA, AREVA NP, and Framatome.

Break preclusion and quality deviations in the welds of the main secondary circuit

On 30 November 2017, EDF declared a significant event to the Nuclear safety authority regarding the detection of a quality deviation in the welding in the main secondary pipes that transfer the steam from steam generators to the turbine at Flamanville 3 EPR.

This system was designed and manufactured according to the "break preclusion" concept. This approach consists in strengthening requirements for design, manufacture and monitoring in service. These strengthened requirements, requested by EDF, also involve a "high quality" requirement in the building of these systems [(1)].

Although these requirements were applied during the design phase, they were not properly incorporated into the welding work. Failure to meet these requirements does not necessarily entail non-compliance with the nuclear pressure equipment regulations.

On 10 April 2018 [(2)], EDF notified the ASN of a significant event relating to the detection, during the initial comprehensive inspection, of deviations in the inspection of the welding of the pipes of the main secondary circuit of the Flamanville EPR [(3)] (part of the main secondary circuit was already subject to a deviation with respect to the correct application of "break preclusion" requirements). In accordance with industrial procedures, the welds had been inspected by the consortium of contractors in charge of manufacturing the system. Each weld had been declared compliant by the consortium just as they were being completed. EDF therefore began a further inspection during the second quarter of 2018 of all welds concerned in the main secondary circuit. For eight of these, known as reactor containment building penetration welds, on 3 December 2018 EDF suggested providing a specific "as-is" design calculation file to the ASN.

On 9 and 10 April 2019, the ASN convened the permanent experts' group for pressurised nuclear installations (GP ESPN) as part of its investigation of the discrepancies impacting welds on the main steam pipework for break preclusion at the Flamanville EPR. In its consultative opinion, the permanent group recommended to the ASN that if EDF could not abandon all or part of break preclusion, it should carry out compliance work on these penetration welds.

In a letter dated 7 June 2019, EDF sought the ASN's opinion on the possibility of repairing these welds after commissioning of the reactor, taking the view that commissioning of the installation in its current state presented no risks to safety (since the integrity of these lines had been demonstrated), and that post-start-up upgrading would allow the upgrading method used to be developed and optimised. In a letter dated 19 June 2019, the Nuclear Safety Authority (ASN) asked EDF to rework, before commissioning, the eight penetration welds on the Flamanville EPR reactor containment building that deviated from the break preclusion reference document [(4)]. EDF therefore assessed three reworking scenarios [(5)].

This work led to discussions with ASN; on 4 October 2019, the latter sent EDF a letter discussing the technical acceptability of these three scenarios. The scenario for VVP [(6)] penetration weld repairs finally selected by EDF involves the use of remotely controlled robots, designed to conduct high-precision operations within the pipework in question. This technology has been developed for the fleet in operation and must be qualified for reworking penetration welds. In view of this strategy for reworking the penetration welds, in its meeting on 8 October 2019, EDF's Board of Directors approved the continuation of works at the Flamanville EPR site.

In total, at this stage, repairs concern some one hundred welds on the Main Secondary Circuit (*Circuit Secondaire Principal*, CSP), on the steam generator water supply lines (ARE), and on the steam generator steam removal lines (VVP). At this stage, repairing the penetration welds is one of the key challenges on the critical pathway. However, repair work on other welds and other activities underway on the worksite are also creating additional risk to the schedule and the target cost on completion for the reactor.

(1) Given that these requirements were stated, the potential for pipes rupturing did not have to be considered during the safety demonstration. This proves, with a high degree of confidence, that accidents are physically impossible or extremely unlikely and that their consequences are limited to acceptable economic conditions.

(2) See EDF press release of 10 April 2018 "EDF has detected quality deviations on certain welds of the main secondary circuit of the Flamanville EPR and has begun additional controls".

(3) The initial comprehensive inspection, is a regulatory requirement prior to the plant commissioning, which consists, in particular, in examining the welds of the primary and secondary systems. It gives rise to an initial benchmark report on the state of plant before it begins operation.

(4) See EDF's press release of 20 June 2019:'Flamanville EPR: EDF notes the French Nuclear Safety Authority's decision".

(5) See EDF's press release of 26 July 2019.

(6) VVP: steam discharge pipework circuit.

The final decision by the ASN to grant approval for the procedure as a whole, with remotely-controlled robots used to rectify the penetration welds, has been postponed, and is now expected in the first quarter of 2021. The start of VVP penetration weld repairs is subject to this ruling. Work to remove the relevant pipework was nevertheless begun at the end of 2020. This work package is one of those on the critical pathway for finalising the EPR worksite within the target schedule. The qualification of the ARE penetration repair process is underway, with the goal of works taking place at the end of the second half of 2021. This process is an adaptation of the one used for VVP penetration repairs.

The technical investigation into reworking the welds located on the main secondary circuit with quality shortfalls and/or not complying with the requirements of the break preclusion reference document defined by EDF is ongoing. The ASN gave its agreement in July 2020 for the repair of a first batch of five welds, then in November for the repair of a second batch of two welds. The five welds in the first batch were successfully repaired; repairs on the two welds in the second batch were being checked in early 2021.

Beyond that, on 2 June 2020, ASN asked EDF to conduct fresh survey inspections of the Main Primary Circuit (*Circuit Primaire Principal,* CPP). EDF has drawn up a sample of welds that are representative of all CPP welds for which a second X-ray inspection is to be performed. Work started on 24 February 2021 and is due to continue through to the second half of 2021. This re-inspection programme is being monitored by an ASN-accredited contractor. In a separate development, on 2 March 2021 EDF declared a significant event to ASN. This concerned the incomplete consideration of the 2006 study referential in respect of the implantation of three nozzles on the main primary circuit (a nozzle allows to connect auxiliary circuits to the primary circuit). EDF and Framatome engineering teams are currently carrying out an instruction to identify, and then propose to ASN, documentary or corrective actions; to date, no impact on the schedule or costs has been identified.

Commissioning schedule and construction costs

On 9 October 2019 [(1)] the Group submitted a new schedule and a new estimate of construction costs for the Flamanville EPR. In its press release of 9 October 2019, EDF specified that the provisional schedule for implementing the preferred scenario for repairing the penetration welds, subject to the date on which the ASN would approve this scenario, would mean the fuel being loaded at the end of 2022, and a revised construction cost of €12.4 billion [(2)] excluding interim interest. Such excluding interim interest as included in the financial statements as of 31 December 2020 amount to €3,291 million. The additional costs with respect to the previous estimate of $€_{2015}$ 1.5 billion have mostly been booked under "other income and expenses" [(3)] rather than as investments. For 2020, these additional costs booked as "other income and expenses" amounted to €397 million.

At the end of 2020, the review of the impact of the first lockdown on the works did not result in any change to the target dates for loading fuel or the construction costs announced in October 2019, but indicated that the project no longer has any margins, either in terms of its schedule or in terms of costs. Meeting these targets is dependent on a number of factors and technical issues, including ASN investigations. The postponement of approval by the ASN of the penetration weld repairs by remotely operated robots is an additional risk to both cost on completion and the works schedule.

The risk regarding the schedule and cost on completion is therefore very high.

Other risks

If the alternative scenario for penetration weld repairs (not EDF's preferred scenario) were ultimately to be chosen, this would entail both more additional costs and potentially significant delays.

As works progress, new technical issues emerge and may increase the risk of a postponement. In addition, worksite delays entail a risk of equipment and materials ageing.

Furthermore, other risks may also emerge (see also section 2.2.4 "Operating Performance" – risk factor 4A "Management of large and complex industrial project (including EPR projects)").

1.4.1.1.3.2 Other "New Nuclear" projects

United Kingdom

In the UK, EDF Energy owns 66.5% of the construction project of two nuclear reactors at Hinkley Point, with the remaining 33.5% owned by China General Nuclear Power Corporation (CGN). Nuclear New Build (NNB) is the project owner and the New Nuclear Projects and Engineering Department together with Edvance are responsible for the design studies.

EDF is also working, as part of its partnership with CGN, on two nuclear construction projects in the UK: Sizewell C and Bradwell B.

See also section 1.4.5.1.2.5 "Nuclear New Build Division".

Taishan EPR

In China, EDF owns 30% of TNPJVC (Taishan Nuclear Power Joint Venture Company Limited), which was set up to build and operate two EPR nuclear reactors in Taishan, in the province of Guangdong in China. CGN holds a 51% stake and Guandong Energy Group a 19% stake.

Production was 21.5TWh in 2020. It was affected by the drop in consumption due to the Covid-19 crisis and the first scheduled shutdown of unit 1 for its full inspection.

EDF continues to provide technical support to the Taishan project, while simultaneously incorporating feedback from start-up and operation activities for the other EPR projects, mainly FLA3, from successfully completed technical jobs, and from management of the project for the first unit shutdown in the world of an EPR reactor (VC1). In 2020, the main challenge was to ensure the success and industrial management of the full inspection of unit 1. However, after this shutdown, the unit 1 reactor did not recover its full nominal power. Analysis is underway. In 2021, TNPJVC will carry out a full inspection of unit 2.

The feed-in tariff for the electricity generated by Taishan, in force until the end of 2021, is lower than expected by EDF. Efforts are still under way with the relevant Chinese authorities which will decide on the future price terms (see section 2.2.4 – risk 4A – "Management of large and complex industrial projects (including EPR projects)" – "China").

Preparation of a programme to build new nuclear reactors in France

On 25 January 2019, the French government published the main guidelines of the Multi-year Energy Programme as adopted by decree dated 21 April 2020. In accordance with these directions, the government has asked EDF to prepare an exhaustive file with the nuclear industry by mid-2021 relating to a programme of renewal of nuclear facilities in France. The sector contract signed on 28 January 2019 by the French government and the Nuclear Sector Strategic Committee (CSFN) contains a section on the preparation of the industrial capacity necessary for the performance of a programme of construction of new reactors in France. In order to keep in line with this initiative, EDF has started to prepare economic and industrial proposals based on the EPR 2 technology. EDF will provide the information to enable the French government to define an appropriate regulatory framework for the financing of such an industrial programme.

EPR 2

On 15 April 2016, EDF submitted a safety options file for the "New Model EPR" (NM EPR) project to the French Nuclear Safety Authority.

In early 2018, the permanent experts' group for nuclear reactors submitted its conclusions on the safety options file. In particular, it found that "*most changes in the design used for the NM EPR project take into account the lessons learned from the feedback on Flamanville EPR and on the reactors currently operating as well as lessons learned from the accident at Fukushima Daiichi*," and "*is of the opinion that the design options used for the NM EPR project, complemented or modified in the light of the discussions held during the technical examination which have led to a number of commitments, are likely to ensure a safety level at least equivalent to that of the Flamanville 3 EPR reactor and complies with the recommendations of ASN Guide 22 (on the design of Pressurised Water Reactors).*"

(1) See EDF's press release of 9 October 2019, "Flamanville EPR: EDF favours a scenario to rework the penetration welds on the main secondary circuit using robots and adjusts the schedule and construction cost estimation".

(2) In 2015 euros.

(3) IAS 16 paragraph 22 on abnormal costs incurred in connection with assets constructed by the Company. These costs will affect the years 2020, 2021, and 2022.

In its opinion no. 2019-AV-0329 of 16 July 2019 relative to the safety options file, the French Nuclear Safety Authority "*considers that the safety handbook adopted for the planned NM EPR reactor is on the whole satisfactory, in particular as regards legislation, the guide dated 18 July 2017 […] and international recommendations*".

Furthermore, the work undertaken by EDF and Framatome on the New Model EPR project led to the finalising in 2017 of the technical configuration of a model named EPR 2 which could replace the nuclear fleet currently operating in France and ultimately expand the French nuclear industry's export offers. EPR 2 is an optimised version of the EPR, following on from the EPR in industrial terms, whilst integrating feedback from EPR worksites and power plants currently in operation.

As of this date, EDF informed the ASN of the new configuration. In the same opinion as the one on NM EPR, the ASN deemed that the findings relating to NM EPR would also apply to EPR 2.

Pending a ruling on EPR 2, on 16 December 2020, the Board of Directors authorised EDF to continue the project until the end of 2022. Total related costs amount to €1 billion, some of which is subject to conditions.

Pursuant to the demand made by the French State, EDF is continuing work on design, costing, regulation, funding, and waste treatment with a view to supplying the government with a full proposal by mid-2021. This would be for the completion of a programme to construct three pairs of EPR 2s, based on the scenario of constructing them one after the other 1/ at Penly, 2/ at Gravelines, 3/ on a riverbank site in the Auvergne Rhône Alpes region (Bugey or Tricastin), whilst continuing with feasibility studies for other nuclear sites.

On 8 December 2020, the French President stated that "*the final decision on whether or not to build new reactors must be prepared, and taken by 2023 at the latest, once the Flamanville EPR has entered service*."

Projects under development

- In March 2018, EDF signed a non-binding industrial cooperation agreement with the Indian national electricity company Nuclear Power Corp of India Ltd. (NPCIL) for the construction of 6 EPR reactors in India at the Jaitapur site. This agreement sets out the industrial plan, the roles and responsibilities of partners, and the next steps in the project. In this regard, EDF group and its partners would be supplying all the studies and equipment for the nuclear island, the conventional island, the auxiliary systems, and the heat sinks and galleries. EDF will not be investing in this project and the NPCIL customer will be the general project manager and integrator in the execution phase. In accordance with the schedule determined by the IWFA [(1)], EDF and its partners submitted a comprehensive conditional non-binding bid to NPCIL at the end of 2018. The technical and commercial harmonisation process continued in 2020 with client NPCIL, so as to enable EDF to supply a conditional binding technical and commercial offer during the first half of 2021. As of the end of 2020, certain significant technical and commercial issues had not been harmonised. EDF is aiming for a General Framework Agreement to be signed in the months following the bid, allowing the project execution activities to commence.
- EDF is also participating in the call for tenders initiated in Saudi Arabia by K.A.CARE (King Abdullah City for Atomic and Renewable Energy) for a construction project relating to two EPR reactors. EDF made a successful bid in the first phase of the consultation process known as FEED-A (Front End Engineering and Design) and is currently taking part in the preparatory phase of the project; this should lead to the second phase of the call for tender process, currently expected in the second half of 2021.
- In mid-2020, EDF decided to engage technical development efforts to refine a medium-power design based on EPR technology, alongside its high-power EPR offer. Known as EPR1200, this adjustment to 1,200MW power incorporates optimisations drawing on different projects and should meet the expectations of clients seeking a medium-power solution, for instance in the Czech Republic.
- Regarding Small Modular Reactors (SMRs), in 2020 there was progress in the development of a 340MW pressurised water plant with two 170MW units known as NUWARDTM. In this power bracket, the product is aimed mainly at the export market and the replacement of the oldest fossil fuel power plants to be decommissioned in the coming decades. This product is being developed under the supervision of EDF with its partners CEA, Naval Group, and TechnicAtome. Given its export target, this development is the subject of an investigation into the viability of cooperation with an international partner. The development has a budget of €50 million granted by the French State as part of the September 2020 "*France Relance*" plan.

1.4.1.1.3.3 The digital transformation of nuclear engineering (SWITCH programme)

Launched in July 2017, this programme feeds into EDF's CAP 2030 strategy, under sections related to managing current new nuclear projects, extending the operating life of the fleet in operation, expanding abroad and embracing digital transformation. It is a multifunctional programme involving all EDF players in the nuclear sector, including Framatome.

The programme seeks to mark a turning point in engineering by:

- transforming and simplifying processes and methods to better grasp the complexity of large-scale industrial projects throughout their lifecycle by applying systems engineering standards, among other methods;
- implementing a new integrated, collaborative, industrial information system based on digital capacities with a Data-Centric approach, working as an extended enterprise with partners and suppliers.

1.4.1.1.4 Nuclear generation activities: Framatome

Framatome is a key player in nuclear energy, acclaimed for its innovative solutions and high added value technologies for the nuclear fleet worldwide. Benefiting from its global expertise and backed by sound references, the company designs, maintains, and installs components and fuel, as well as instrumentation & control systems for nuclear power plants. With a workforce of some 14,000 employees, Framatome is able to supply its clients with an increasingly clean, safe, and cheap low-carbon energy mix on a daily basis.

Framatome is jointly owned by Groupe EDF (75.5%), Mitsubishi Heavy Industries (MHI – 19.5%), and Assystem (5%).

Framatome has a significant industrial presence in France, Germany, the United States and China. The company also has an industrial or sales presence in South Africa, Argentina, Brazil, Bulgaria, Canada, South Korea, Spain, Finland, Hungary, Japan, Czech Republic, United Kingdom, Russia, Slovakia, Kazakhstan, Sweden and Ukraine.

Framatome recruited some 1,000 employees in 2020.

Framatome's strategy is based on its core business *i.e.* nuclear steam supply systems, and aims to offer safe and competitive solutions, industrialise them and carry out the projects as part of an industrial sector.

The company's customer base includes leading international energy players and it works on over 300 reactors in the world. With Framatome's experience in reactors of all types of technologies it can meet the specific needs of its customers worldwide.

With a current global fleet of 450 reactors representing close to 396GWe in service in 31 countries [(2)], and new forthcoming nuclear capacities, the nuclear market offers opportunities in the field of fuel, modernisation and services. Framatome's goal is to expand its market share through a differentiated offer and export partnerships.

(1) Industrial Way Forward Agreement.

(2) Source: CEA – Élecnuc – 2019 Edition, figures at 31 December 2018 (http://www.cea.fr/english/Documents/scientific-and-economic-publications/Elecnuc-2019.pdf).

1.4.1.1.4.1 Framatome's activities

With an experience built up over 60 years in the design and construction of nuclear plants, Framatome is present at every stage of the process. With its highly skilled engineers and operators, the company has completed more than 90 nuclear power plant projects around the world to date.

Engineering

Framatome's experts are specialised in the design of the principal items of equipment making up nuclear steam supply systems, and that includes mechanics and metallurgy, neutronics, the scientific calculation work, fluid mechanics and risk and safety analysis. Framatome's engineering services include the heart of the power plant, referred to as the "nuclear island", and the main components of the reactor's primary circuit such as steam generators, pumps, pressurisers, as well as the nuclear reactor pressure vessel itself. Its specialists and technicians are actively involved in major new nuclear power plant construction projects such as the new EPR reactors.

Equipment manufacturing

Framatome components equip more than 100 power plants in 11 countries. At its plants in Le Creusot, Saint Marcel and Jeumont, in France, Framatome's manufacturing plants produce the key equipment for nuclear steam supply systems for electrical utilities all over the world to equip new-build power plants or to replace items of equipment at power plants in operation. The company manufactures advanced technology heavy equipment (reactor pressure vessels, steam generators, etc.) and mobile components (reactor coolant pumps and control rod drive mechanisms). Since 1970, around 10,000 components have been produced at its manufacturing sites by Framatome's forge workers, machinists, materials technicians, mechanical test technicians, boilermakers and welders.

In 2020, the company continued to ramp up production at its Le Creusot plant in Burgundy, specialising in the manufacture of heavy components for the nuclear industry. The Le Creusot plant also supplies the main forged components for new construction projects abroad, in particular for the EPR reactor project of Hinkley Point C in the UK, as well as parts for replacement components intended for French reactors.

At the same time, Framatome has joined EDF group's excell plan. This aims to enable the French nuclear industry to have the highest standards of quality and excellence in the management of nuclear projects. In this respect, Framatome component factories are rolling out plans designed to guarantee "right first time" compliance of manufacture and construction. Actions are also being conducted to this end within the supply chain.

An arbitration procedure has been commenced with respect to the manufacturing discrepancy for the HS bottom casing on reactor no. 2 in Fessenheim and the HS top casing to be installed on reactor no. 5 in Gravelines.

In 2019, Framatome launched a programme designed to consolidate knowledge relating to the performance of local stress-relieving heat treatments (SRHT) used in factories and on worksites on equipment supplied by Framatome, after it became apparent that the temperature range was not observed during the application of certain local processes, constituting a deviation from specifications. Three deviations were investigated in 2019 and 2020 for local SRHT processes used on welds on heavy plant. In 2020, two other deviations were investigated on SRHTs for welds on secondary pipes. In consultation with the operators concerned, and within the framework of the regulatory specifications for each component, these deviations are being treated by Framatome, leading to detailed description studies to confirm the mechanical properties of the materials concerned by means of special test programmes. With respect to the components being used, this verification programme of calculations and tests has so far confirmed that the mechanical integrity of the parts in question has not been compromised. Framatome is keeping the operators and the Safety Authorities concerned regularly informed. See section 2.2.5 "Specific risks relating to nuclear activities" – risk factor 5 A.

Instrumentation & control systems

Framatome designs, manufactures and installs safe nuclear instrumentation solutions and instrumentation & control systems for plants in operation and new builds. Its solutions range from safety instrumentation & control systems to automation systems for normal operation, from nuclear instrumentation to lifecycle solutions, from simulators and global I&C engineering expertise to human-machine interface design and human factors engineering. Framatome has installed over 300 complete instrumentation and instrumentation & control systems on reactors of all types worldwide.

In December, Framatome signed a final purchase agreement with Rolls-Royce with a view to the acquisition of its Civil Nuclear Instrumentation and Control (I&C) business, which operates mainly in France, and to a lesser extent in China. The transaction should be finalised at the beginning of the second half of 2021, subject to the usual conditions precedent, including regulatory authorisations [(1)].

Fuel

Framatome designs, develops and manufactures fuel assemblies for pressurised water reactors, boiling water reactors and research reactors. The company's know-how spans the entire process: from the design of the fuel assembly, to the production of zirconium and its alloys – zirconium being vitally important for fuel production – on to fuel fabrication and related services, right through to operations on the nuclear power plants. The company performs all relevant calculations from general fuel management up to dedicated licensing for the highest performance and safety. Over 226,000 Framatome fuel assemblies have been loaded in more than 100 reactors in operation around the world.

In early October, Framatome commissioned its new uranium waste recycling facility at the fuel manufacture site in Richland, USA. Covering an area of over 1,000m^2, the building houses advanced processes and technology enabling uranium to be recovered from the fuel manufacture process.

Commissioning and licensing of nuclear power plants

Framatome has substantial international experience working with nuclear safety authorities on all types of reactors currently in service around the world. The company also offers support for operators through relationships with their respective safety authority and in the application of existing regulations in their country of establishment. In France, Framatome has expertise in the application of the Order relating to nuclear pressure equipment (*Arrêté relatif aux Équipements sous Pression Nucléaire*, ESPN). The company also provides its international customers with technical centers where numerous tests are carried out each year to qualify their equipment. It assists them in the preparation of qualification studies and associated documentation.

Maintaining, modernising and extending operating lifetime of existing nuclear power plants

Framatome offers innovative solutions and services to maintain and modernise existing nuclear power plants, and extend the lifetime of existing installations, while guaranteeing the safety, performance and availability of operations. Framatome has 60 years' international experience of all types of technologies and maintenance of more than 300 reactors worldwide. Its teams have expertise and knowledge in maintenance, component replacement, inspections and checks, refuelling operations, and optimised management of reactor shutdowns for maintenance. More specifically, its activities cover supply of fuel assemblies and related services, management of equipment and spare parts, modernisation of I&C and instrumentation, and chemistry and radiochemistry services.

In June, Framatome announced the acquisition of BWX Technologies Inc.'s commercial nuclear services in the United States [(2)], thus expanding its portfolio of equipment and tooling for nuclear power plant inspections and maintenance which strengthens its position in the nuclear energy industry.

(1) See Framatome's press release dated 7 December 2020 "Framatome signed an agreement with Rolls Royce to acquire its Civil Nuclear Instrumentation and Control business".

(2) See Framatome's press release dated 2 June 2020 "Framatome completes acquisition of BWXT's US commercial nuclear services".

Management of large projects

Framatome's participation in the construction of new-build nuclear reactor projects spans across design, through procurement and supply, and onto commissioning. With recognised expertise in the management of complex projects, its teams are tasked with delivering to the most stringent security standards and fulfil the requirements of its customers. In the case of new-build construction projects, the company proposes solutions for the nuclear island scope. Framatome is actively involved with EDF in the construction, commissioning and maintenance of 5 EPR reactors worldwide: in France (Flamanville 3), in China (Taishan 1&2), and in the United Kingdom (Hinkley Point C, reactor 1 and 2).

In 2017, EDF and Framatome created Edvance, a joint engineering subsidiary for the construction of new nuclear power plants in France and in the world (see section 1.2.1 "Organisation of the Company").

1.4.1.1.4.2 Key achievements by Framatome in 2020

2020 was impacted by the Covid-19 crisis. Framatome remained highly mobilised and maintained a good level of activity, although there was a slowdown in component and fuel factories.

- In January, Framatome entered into a contract with Tennessee Valley Authority (TVA) for the supply of ATRIUM 11 fuel for the Browns Ferry power plant, fuel handling equipment upgrades for all TVA reactors, and the replacement of steam generators at the Watts Bar nuclear power plant [(1)].
- In February, TVO, which operates the Olkiluoto nuclear power plant in Finland, entrusted Framatome with maintenance work in the field of engineering, instrumentation and control, and non-destructive testing services over a period of several years during unit shutdowns [(2)].

  Also in February, Framatome and its partner Kinectrics launched a joint venture tasked with supplying and operating the systems to be installed in Bruce Power's nuclear reactors in Canada to produce Lutetium-177, a medical isotope used in cancer treatment [(3)].
- In April, Framatome was awarded a contract for the deliver of the reactor protection system for units 1 and 2 of the Kursk II nuclear power plant in Russia; this includes planning, design, manufacture, and implementing the system [(4)]. This contract is part of the development of the partnership with Rosatom Automated Control System (RASU).

  Also in April, Framatome signed a long-term service contract with Chinese company TNPJVC (Taishan Nuclear Power Joint Venture Company Limited) with a view to support operation of Taishan's two EPR reactors for a period of eight years [(5)]. This contract covers nuclear plant outage and maintenance work, as well as the supply of spare parts and engineering services.
- In July, Framatome entered into a partnership with Siteflow, a French startup that provides cloud-based service management software to digitise the documentation used for maintenance operations in nuclear power plants [(6)].
- In August, Framatome signed a contract with Hinkley Point C for the supply of conventional field instrumentation for the two EPR reactors currently being built in Somerset, UK [(7)]. Approximately 10,000 instruments will monitor and measure temperature, flow, pressure, and level under all operating conditions.
- In September, Framatome signed an exclusive partnership with ADAGOS to provide the nuclear industry with artificial intelligence technology [(8)]. This software, which requires less computational and data resources compared to previous generations, will enable Framatome to provide its clients with new digital solutions.

  Also in September, Framatome joined EDF, the CEA, and six other organisations from the academic world and the French nuclear industry to pool research and development in the field of nuclear reactor digital twins [(9)]. These digital twins will be used as simulators to train the new generation of operators.
- In mid-October, Framatome launched the "Framatome Défense" brand to promote its business supporting French national defence, asserting its commitment and reinforcing its contribution to the sector [(10)]. Framatome has contributed to the production of components for the French Navy, in particular for its submarine and Charles de Gaulle aircraft carrier programmes, and more recently to major programmes such as the Barracuda.

1.4.1.1.4.3 Nuclear facilities and safety

Basic nuclear facilities (BNF)

There are two basic nuclear facilities (BNF) at the Framatome site of Romans, BNF no. 63 (fuel elements fabrication for research reactors – CERCA) and BNF no. 98 (fabrication of fuel assemblies for nuclear power reactors).

2020 results on nuclear safety [(11)]

As in 2019, no major safety or radiation protection event was recorded at Framatome's Romans-sur-Isère site. In 2020, Framatome's Romans-sur-Isère site declared 12 significant safety events (ESS) classified at INES 0, 3 ESS at INES 1 and none at INES 2. The number of events declared is decreasing compared with 2019. No event declared in respect of the year 2020 had any impact on workers, the general public or the environment. The 2020 detailed results on nuclear safety are published in the annual report drawn up by the General Inspector for Nuclear Safety and in the TSN report of the Framatome site of Romans-sur-Isère and are available on the website www.framatome.com.

Dedicated assets

Dedicated assets have been constituted to cover long-term nuclear commitments (see section 6.1 EDF's "Consolidated financial statements at 31 December 2020", note 17.1 "Other provisions for decommissioning").

(1) See Framatome's press release dated 3 February 2020 "Framatome signs multimillion-dollar contracts with Tennessee Valley Authority".

(2) See Framatome's press release dated 19 February 2020 "Framatome signs service contracts with Finnish utility TVO to support long-term operation of Olkiluoto 3 EPR".

(3) See Framatome's press release dated 28 February 2020 "Framatome and Kinectrics Launch Joint Venture to Produce Medical Isotopes for Lifesaving Cancer Treatments".

(4) See Framatome's press release dated 8 April 2020 "Framatome to deliver reactor protection system to Kursk Nuclear Power Plant II in Russia".

(5) See Framatome's press release dated 14 April 2020 "Framatome signs long-term service contract to support operation at Taishan EPRs in China".

(6) See Framatome's press release dated 15 July 2020 "Framatome partners with Siteflow to support maintenance and operations digitization at nuclear facilities".

(7) See Framatome's press release dated 25 August 2020 "Framatome signs contract to provide field instrumentation to Hinkley Point C".

(8) See Framatome's press release dated 3 September 2020 "Framatome partners with ADAGOS to bring artificial intelligence to the nuclear energy industry".

(9) See Framatome's press release dated 22 September 2020 "Framatome joins with academia and industry partners to develop nuclear reactor digital twins".

(10) See Framatome's press release dated 19 October 2020 "Framatome launches Framatome Defense to support the French national defence industry".

(11) The objective of Framatome is to detect, report and treat in the best possible manner all deviations and anomalies occurring in connection with its activities. The purpose of this indicator is to enhance the sharing of experience, broaden analysis and the importance given to weak signals. Events declared at level 0 on the INES scale are safety deviations, considered as "weak signals". It is essential to take them into account as part of a continuous improvement process for a better management of risk prevention in the conduct of activities. In order to facilitate the reporting on "weak signals" and the sharing of experience, Framatome detects and records any deviation. The analysis of the latter, by the "*Filière Indépendante de Sûreté*" (independent safety reviewer), assesses the level of reporting to the safety authority.

1.4.1.2 Thermal generation in mainland France

Thermal generation assets have a number of advantages: they are very responsive and flexible (quick to start up and power can be modulated), and they have relatively low investment costs and short construction times.

Thermal generation assets are one of the key components of the energy mix to ensure the balance of generation and consumption in real time by accommodating fluctuations in electricity consumption and renewable energy generation (sun and wind power in particular). They are used to meet mid-merit and peak demand electricity requirements and also help to regulate the system and thereby contribute to maintaining suitable voltage and frequency levels across the grid. This role will increase with the massive inclusion of intermittent generation resources in French and EU electricity systems.

1.4.1.2.1 EDF's thermal generation in mainland France

At 31 December 2020, the thermal generation facilities operated by EDF were of different types, both in terms of fuel and power:

Fuel	Unit capacity *(in MW)*	Number of units in operation at 31/12/2020	Total capacity *(in MW)*	Year commissioned	Output *(in TWh)* At 31/12/2020	Output *(in TWh)* At 31/12/2019
Coal-fired	580	3	1,740	in 1983 and 1984	1.04	0.8
Fuel oil and dual-fuel combustion turbines (gas and fuel oil)	85	4	340	in 1980 and 1981		
	203	1	203	in 1992		
	134	1	134	in 1996		
	125 – 129	2	254	in 1998 and 2007		
	185	2	370	in 2010		
	179 – 182	3	542	in 2008 and 2009	0.46	0.2
Combined Cycle Gas Turbine	427	1	427	in 2011		
	465	2	930	in 2012 and 2013		
	585	1	585	in 2016	7.35	8.8

Power generation in 2020

EDF's electricity generation from its thermal power plants in mainland France represented approximately 2.29% of its total electricity generation in 2020. During the same period, this fleet had a total installed operating capacity of 5,525MW.

Thermal generation in 2020 amounted to 8.85TWh with a lower level of operation than in 2019.

In 2020, coal units supplied 1.04TWh, CCGT plants 7.35TWh and oil-fired units 0.46TWh.

Minimising unplanned outages is the essential aim for facilities such as thermal plants, used for mid-merit and peak generation. The priority for these means of generation required on a variable basis all year round is to ensure maximum reliability and availability. As in previous years, the reliability of the thermal fleet was confirmed in 2020 and is commensurate with EU standards for CCGT and TACs.

The fleet's adaptability to a sustained level of operation was demonstrated. TACs displayed a very good response rate when called upon to operate by the DOAAT and RTE. In a tense balance between supply and demand, the combustion turbines fully played their role in maintaining the system's safety.

1.4.1.2.2 Issues relating to thermal generation

Coal-fired fleet in transition

After having shut down ten coal-fired units between 2013 and 2015, EDF retained three generation plants based on recent technology and located in Le Havre (1 unit) and Cordemais (2 units). A renovation programme for these coal-fired units was completed between 2014 and 2016 in order to improve their reliability and efficiency. They are equipped with flue gas desulphurisation and denitrification systems (90% reduction in sulphur dioxide emissions and 80% reduction in nitrogen oxide emissions) as well as dust collectors that trap virtually all dust. These treatments allow the units to meet environmental regulatory requirements in force since 2016.

Decree 2019-1467 dated 26 December 2019 establishing a cap on greenhouse gas emissions for fossil fuel-fired electricity generation facilities is designed to halt electricity generation using coal by 2022. This legal mechanism makes the operator responsible for deciding whether or not to continue operating such installations after 2022 and makes no provision for compensation.

In this respect, EDF decided to shutdown the Le Havre power plant on 1 April 2021.

However, RTE's most recent provisional review reveals the need to maintain the Cordemais power plant "*until the firm commissioning of the Flamanville EPR*". The Cordemais plant will be shut down by 2026 at the latest.

In another development, in 2015 EDF launched the Ecocombust project, aimed at developing green fuel (biomass) by recycling wood waste. On 24 January 2019, EDF and the Ministry for Ecological and Solidarity Transition approved a working programme prior to a decision on the Ecocombust project. This work programme should make it possible to make a decision in 2021 on launching the industrialisation phase. Fuel manufacture could begin from 2023 onwards. This fuel would be used for industrial heating and/or steam generation installations. It could also be used in co-combustion with a smaller proportion of coal in the Cordemais power plant boilers, thus helping to halt the use of coal for electricity generation.

Closure of the oil-fired fleet

EDF decided to permanently shut down the Aramon thermal plant on 1 April 2016 and the Porcheville and Cordemais unit 2 thermal plants in the spring of 2017 as they had been scarcely used over the past number of years.

EDF also permanently shut down the last oil-fired unit (Cordemais 3) in the spring of 2018.

Modernising the thermal generation fleet with natural gas combined cycle turbines

EDF commissioned the first Combined Cycle Gas Turbine (CCGT) plant in France at Blénod in 2011, then two CCGT plants at Martigues in 2012 and 2013 followed by a next-generation CCGT plant at Bouchain in 2016 in partnership with General Electric. This modernisation of the thermal generation fleet reduces its atmospheric emissions of CO_2, nitrogen oxides and sulphur oxides.

The CCGTs in Martigues are the result of the repowering of former oil-fired units, a part of whose facilities, such as the steam turbine, the condenser and the water treatment facilities, were reused. The repowering of a unit of this capacity is a first in Europe. The installed capacity of the Martigues site is 930MW and the return is over 50%, markedly higher than the return from coal-fired thermal units, for example.

The CCGT plant at Bouchain is equipped with General Electric's new high-capacity "9HA" turbine. The innovative 9HA CCGT delivers improved capacity (600MW achievable in under 30 minutes) and return (over 60%) and offers good environmental performance with CO_2 emissions of around 360g/KWh on average, one-third of those of the old neighbouring coal-fired plant shut down in 2015. Under specific operating conditions it generated a record return of 62.22%. Operation of the facility was less sustained in 2020 (5,071 hours and 2.4TWh) compared to 2019 (6,015 hours and 2.8TWh), because of a long shutdown to perform a first hot part inspection (IPC) on the TAC 9HA.

Compliance with the regulatory framework

Regulatory notice

Regulations applicable to fossil fuel-fired energy generation

Fossil fuel-fired power plants are subject to legislation on facilities that are classified for the protection of the environment (ICPEs), which is organised in the French Environment Code. Activities covered by listed facilities legislation are listed in a register which places them in a declaration, registration, or authorisation regime depending on the level of risks and drawbacks which may arise. These regulations require sites to be restored when a facility is taken out of service, depending on the expected future use of the land; for certain facilities, the constitution of financial guarantees is also required. Depending on the nature of the hazards and/or drawbacks for each category of installation, these are designed to ensure surveillance of the site, the ongoing security of the facility, interventions in the event of accidents prior to or subsequent to closure, and restoration of the site after closure.

Thermal generation activities are also subject to other specific regulations, including those resulting from Directive 2012/18 of 4 July 2012 (known as "Seveso-III") as well as the more general air quality legislation resulting from EU Directive 2001/81/EC of 23 October 2001 on the reduction of national emissions of certain atmospheric pollutants (the "NEC Directive"), Directive 2010/75/EU of 24 November 2010 on industrial emissions (IED), and Directive 2015/2193/EU on the limitation of emissions of certain pollutants into the air from medium combustion plants (sulphur dioxide, (SO_2), nitrogen oxides (NO_x) and dust).

In 2020, EDF's thermal power plants in mainland France emitted 4.05 million tonnes of CO_2 (4.3 million tonnes in 2019) for a net electricity generation of about 8.85TWh (9.85TWh in 2019). The CO_2 content pe, kWh generated by EDF's thermal power plants in mainland France in 2020 is 449 g/kWh net (426 g/kWh net in 2019 [(1)]). This slight rise in the CO_2 component of EDF's thermal kWh is the result of a smaller proportion of CCGT plants in EDF's thermal generation mix; these accounted for some 83% of thermal generation fleet output in 2020 (compared to 89% in 2019). It is to be noted that in 2010, the CO_2 content pe, kWh generated by EDF's thermal fleet in mainland France was still more than 900g CO2/kWh net.

In 2020, EDF's thermal generation fleet in mainland France also emitted 0.7kt of SO_2, 2.7kt of NO_x and 0.02kt of dust. Per kWh generated, polluting emissions from EDF's thermal plants have fallen compared with 2010 by six times for NO_x, by over thirty-five times for SO_2 and by over seventy times for dust. These drastic reductions in emissions were made possible by the shutdown of the oldest thermal plants, the renovation and installation of smoke treatment equipment using the best techniques available at the most recent plants, the use of low sulphur fuel and the commissioning of low pollution natural gas combined cycle turbines.

The environmental performance of the thermal fleet in mainland France is fully in keeping with the Sustainable Development goals set out by the EDF group. In particular, these aim to reduce greenhouse gas emissions to 25 million tons of CO_2 eq by 2030, in keeping with the commitment to become carbon-neutral by 2050.

Decommissioning of shut down units

EDF has planned all of the decommissioning operations on its thermal fleet units which were shut down or whose shutdown is scheduled. The provisions for these operations have been made in an amount that corresponds to the cost of decommissioning all of the units being operated and the clean-up of the sites (see section 6.1 "Consolidated financial statements at 31 December 2020", note 17.1 "Other provisions for decommissioning").

In 2020, EDF continued the decommissioning work on sites that had been definitively shut down. The main work carried out in 2020 was asbestos removal on the units withdrawn from operation at Cordemais and Le Havre, together with decommissioning on the Vitry site. Following on from this work, EDF commissioned and carried out a number of expert appraisal and ground depollution works, in particular at Vitry, Aramon, and Porcheville.

EDF is careful to preserve the potential of its sites to the greatest extent possible, with precision allocation of space and the implementation of local monitoring of planning regulations so as to secure its own needs. This differentiated ground and space management has made it possible to free up EDF land from occupancy issues (freeing up new land resources, biodiversity potential, and restoring natural land), taking into account the Group's new needs and assisting local authorities with the development of new types of activity.

1.4.1.3 Renewable energy generation and storage

EDF group is now the leader in renewable energy in Europe and more specifically, the leading supplier of hydropower in the European Union. Hydropower generation is the Group's most significant renewable energy source, with installed capacity of 22.3GW. The Group is also leader in developing competitive industrial sectors, primarily wind and solar. EDF's goal is to achieve 21.3GW of net installed capacity in solar and wind power by the end of 2024. Renewable energies already account for a quarter of the Group's overall installed capacity.

The EDF group's commitments in terms of developing renewable energy are also described in section 3.1.1.4 "EDF, a company committed to the development of decarbonated energy in Europe".

Net group installed capacity in renewable energy at end 2020*

(in MW)	Hydropower	Wind	Photovoltaic	Biomass	Geothermal	Marine	Total
France	20,484	1,546	291	208	1	240	22,770
Europe excl. France	1,155	1,838	94	7			3,093
America	205	4,230	1,127				5,562
Asia	432	430	213				1,075
Africa	-	335	474				809
TOTAL NET INSTALLED CAPACITY	**22,276**	**8,379**	**2,199**	**215**	**1**	**240**	**33,310**

* *As a proportion of the percentage held.*

(1) This indicator is calculated by comparing CO_2 emissions to net energy in operation (including self-consumption by auxiliary unit systems).

1.4.1.3.1 Hydropower generation in France

1.4.1.3.1.1.EDF's hydropower generation fleet

Hydroelectricity is the second source of electricity generation after nuclear power and the first source of renewable electricity in France. This is an important sector for the electricity system for many reasons, particularly in terms of grid security and balancing.

EDF's hydropower fleet in mainland France includes about 500 plants, including the plants belonging to French subsidiaries and cross-border companies (Franco-German and Franco-Swiss power plants). There were 427 plants within the scope of EDF SA at the end of 2020, with an average age of 75 years [1]:

Hydropower plants	31/12/2020	31/12/2019
Total Maximum Capacity *(in GW)*	20.1	20.1
Total Output Including Pumping* *(in TWh)*	44.7	39.7

* *Corresponds to the sum of the exact values rounded to one decimal place.*

Within mainland France, hydropower plants are mainly located in mountainous areas in the Pyrenees, the Alps, the Massif Central and the Jura, as well as on the Rhine. In all, they represent an installed capacity of approximately 20.1GW (excluding French overseas departments and Corsica), or 23.1% of EDF fleet's installed capacity, for an annual productible energy of more than 40TWh.

The various hydropower facilities are designed to optimise the use of water resources in the valleys where they are situated, as part of multi-purpose water management (detailed in section 1.4.1.3.1.4 "Hydropower generation issues"). Given the size and variety of its fleet, EDF has facilities able to respond to all types of desired uses, from base to peak generation which also offer levers for optimisation due to their flexibility:

- "run-of-river" plants, like the ones on the Rhine, which have almost no storage capacity and generate electricity depending on the available water flow;
- plants with pondage, thus accessing average-sized reservoirs (smaller than lakes) for occasional use during the week or during the day, to cover peaks in demand;
- lake plants (seasonal reservoirs) located in mountainous areas (Alps, Massif Central, and Pyrenees), providing power on peak consumption days and at peak consumption times;
- pumped-storage plants, which pump water from a lower reservoir to an upper reservoir during periods of low demand when electricity is also lower in cost, in order to build up reserves used to generate energy at peak times (by releasing the stored water through turbines from the upper reservoir to the lower reservoir);
- and a tidal power plant on the River Rance (Brittany) which, using the up and down movement of the tides, provides a very regular supply of electricity.

Facility category	Turbine capacity	Average gravity capacity over 50 years [1]
Run-of-river	3.6GW	16.7TWh
Lake-supplied	8.1GW	14.5TWh
Pondage	3.1GW	8.1TWh
Pumped-storage [2]	5.0GW	1.5TWh
Tidal	240MW	0.5TWh

(1) The average production over 50 years has been re-evaluated on the basis of observed climate change.
(2) Only gravity capacity is counted in the STEPs; pumped energy is not taken into account.

1.4.1.3.1.2 Performance of the hydropower generation fleet

EDF SA's hydropower electricity generation in mainland France before deduction of power required to operate pumped-storage plants was 44.71TWh, amounting to 11.5% of EDF's total electricity production.

In 2020, EDF spent nearly €441 million in mainland France for the development and maintenance of its hydropower generation fleet to ensure optimum and safe operation.

A highly-automated and remotely-managed fleet

In order to take advantage of the flexibility of its hydropower generation facilities, for some years now EDF has been initiating ambitious programmes involving automation, remote control of hydropower plants and centralised management for each valley. Currently, the largest plants in EDF's hydropower fleet, representing over 15.6GW (around 77% of its installed hydropower capacity) are remote-controlled from four control centres able to make adjustments to the plants' operating programmes at any time in order to respond to the needs of the electrical system and to economic opportunities arising on the electricity market.

To improve the reliability of its largest power plants, EDF monitors physical parameters (including temperature and vibration) of machinery, from five regional operations centres. This enables any discrepancy to be speedily detected; incidents can be avoided thanks to greater familiarity with the status and operational behaviour of the equipment.

Technical performance of the fleet and hydropower conditions in 2020

Hydropower generation may witness substantial variations from one year to the next, depending on climatic fluctuations in water resources. 2020 saw a slight surplus in hydropower generation and good production performance due to all entities being used to mitigate the impact of the health crisis on the operation and maintenance of the generation fleet, against the backdrop of ongoing transformation procedures.

The 2020 generation indicators show a highly satisfactory level of performance with a low rate of internal loss [2] of 3.8% (4.0% in 2019). The overall availability of the hydropower fleet, *i.e.* the percentage of time over the year during which the power plants are available at full capacity, was 99.4% compared with 99.3% in 2019. The loss rate was 3.3% in 2020 (compared to 4.0% in 2019).

Anticipating needs relating to the expansion of variable renewable energy (solar and wind power), the emphasis is on increasing the flexibility of hydroelectric production resources and adaptation of power plant remote operation to capture the opportunities opened up by the development of European intraday power trading.

In 2020, EDF's hydropower generation fleet experienced exceptional weather damage. The Nice hinterland was severely hit by storm Alex, with a catastrophic impact on the local population. EDF's hydropower facilities suffered from flash flooding of the Vésubie and Roya waterways, a flood with an estimated return period of 100 years. EDF ensured its personnel was kept safe and constantly checked that its installations also remained safe to ensure local residents were protected. A large number of installations and equipment were seriously damaged along these two waterways.

(1) Arithmetic mean.

(2) Internal loss is the energy from flows that do not pass through turbines which were not stored. The rate of internal loss is obtained by dividing the internal loss by the generation performed during the year, and then adding the total loss.

A vast logistics operation was triggered to secure the recovery of industrial installations, the safety of third parties, and support for staff and their families. This enabled the least-affected plants to resume production less than a week after the floods. A support campaign for the local populations and employees was also implemented [1].

By the end of 2020, nine plants had become operational again, while five others were still shut down, including the Roquebillière power plant, which was totally destroyed.

1.4.1.3.1.3 Hydropower safety

Hydropower safety comprises all the measures taken when designing and operating hydropower plants to reduce risks and hazards to people and property associated with water and the presence or operation of facilities. Hydropower safety is the major and permanent concern of the producer (see section 2.2.4 "Operational Performance", risk factor "4B, impact on hydro power safety").

It involves three main activities:

- the management of operational risks, by providing information to users (communication campaigns, information of the employees operating on waterways, hiring "hydro-guides" during the summer months) about changes to water levels or flow fluctuations in downstream waterways;
- the management of facilities during periods of exceptionally high water levels, in order to ensure safety at the facilities and for the surrounding communities;
- measures to address the major risk associated with dam or reservoir failures, through the regular monitoring and maintenance of facilities under the supervision of public authorities. Of the largest dams, 67 of them are subject to a special administrative procedure ("Special Intervention Plan") implemented by the relevant prefect.

EDF performs regular monitoring and maintenance of dams, in particular by means of continuous structural health monitoring.

Furthermore, for each of the 240 class A and B dams, a danger study is conducted every ten or fifteen years (for one class A dam and one class B dam respectively). These studies consolidate an overview of the structures and associated countermeasures forming part of a risk mitigation procedure [2], and include complete assessments, carried out using underwater equipment or by emptying the reservoir. These operations are carried out under the strict supervision of public authorities.

Regulatory notice

Regulation applicable to the safety and security of facilities

Articles R. 214-112 *et seq*. of the French Environment Code contain provisions that are applicable to the safety and security of hydropower facilities that are authorised and operated under concession contracts. Dams are divided into three classes (A, B and C) according to their characteristics, in particular their height and the volume of the floodwaters. According to this classification and the legal rules applicable to the facility, the regulations require the operator or concession contract holder to fulfil a certain number of obligations in order to guarantee the safety and security thereof.

1.4.1.3.1.4 Hydropower generation issues

Hydro power is a key component in energy transition, due both to the low-carbon nature of output and to its flexibility and storage capacity, which outperforms other energy storage solutions by far. The PPE set ambitious goals for the development of hydroelectric power in France, aiming for +1GW of gravity capacity and +1.5GW of STEPs (pumped-storage hydropower plants) by 2030-2035.

Over and above the production of renewable energy and its expansion, hydroelectric power also plays a major role in managing water resources locally.

Concession renewals

Regulatory notice

Regulations applicable to hydropower facilities in France

In France, hydropower facilities are subject to the provisions contained in Articles L. 511-1 *et seq*. of the French Energy Code. They require concession agreements granted by the State (for facilities generating over 4.5MW), or an authorisation from the Prefecture (for facilities under 4.5MW).

Under the French Energy Code, the granting of a hydropower concession is preceded by public notice and competitive tendering in accordance with the terms and conditions set out in Part III of the French Public Procurement Code, subject to the provisions of the French Energy Code.

In accordance with Article L. 523-2 of the French Energy Code, when a hydropower concession contract is renewed or extended under the conditions provided for by Articles L. 521-16-2 or L. 521-16-3 of the French Energy Code, an annual concession fee that is proportional to the revenues generated by the concession contract is levied, which is paid in part to the French State and in part to the French *départements* and municipalities through which the waterways used flow.

Hydropower concessions have an initial term of 75 years pursuant to the French Law of 16 October 1919 relating to hydropower use. Most hydropower concessions that expired before 2012 were renewed for terms of 30 to 50 years. However, the French State has not yet renewed 20 concession contracts which lapsed on 31 December 2020, corresponding to installed power of 2,508MW. Since their expiry these concessions have fallen under the "rolling delay" situation defined by Article L. 521-16 par. 3 of the French Energy Code as when a concession that has expired but not been renewed is extended under its former conditions until such time as a new concession is granted so as to ensure the continuity of operations in the meantime.

In this context, EDF is preparing for the renewal of concessions under the legal framework, combining improved energy efficiency, attention to aquatic environments, compensation of the government and municipalities through fees and regional development, while ensuring the safety and security of operations.

Discussions between the French State and the European Commission (EC) to resolve to formal warnings in this respect are ongoing. In the first notice dated 22 October 2015, the European Commission considers that the French State has infringed the provisions of on Article 106 section 1 of the Treaty on the Functioning of the European Union (TFEU) by awarding the majority of the hydroelectric concessions in France to EDF and renewing them with EDF as these steps strengthen EDF's dominant position on the French retail electricity markets. The State replied to this notice, which marked the beginning of an adversarial exchange of positions between the State and the EC, which does not affect the final decision that will be adopted by the EC. As the chief interested party, EDF sent its observations to the EC on 4 January 2016, firmly contesting the EC's analysis and the grounds for this analysis. EDF has since been involved in certain exchanges between the French State and the EC, particularly to provide technical details on the operation of the French market.

Furthermore, on 7 March 2019, the European Commission sent the French government a second formal notification concerning the renewal of hydropower concessions contracts. Seven other Member States also received formal warnings: Austria, Germany, Poland, Sweden, Portugal, and the UK, with Italy also receiving a second, additional formal warning. More specifically concerning France, the Commission alleged problems with the application of European law concerning public orders to these renewals as well as issues of non-compliance of French legislation governing these renewals with the same European Public Order law. The French government had two months to respond to the European Commission.

See also section 2.2.1 "Market regulation: political and legal risks", risk factor 1C – "Changes to the regulatory framework for hydropower concessions".

(1) With the support of the EDF Foundation.

(2) For more details, refer to the report by the Hydro Safety Inspector (Inspecteur pour la sûreté hydraulique) available on EDF's website.

Development of the fleet

In recent years, as part of the ambitious goals set in this area by the French government, EDF has undertaken several major development projects for its hydropower fleet (construction of a new 237MW turbine generator to equip the STEP at La Coche, renovation and capacity increase on the La Bathie plant to increase this facility to 600MW).

In October 2020, EDF commissioned the Romanche Gavet plant (capacity of 97MW for a generation capability of 567GW) [(1)].

EDF has also been active on the "small hydropower" segment, in particular through the development of so-called greenfield projects as part of CRE calls for tender (through its SHEMA subsidiary, EDF was thus awarded 5 projects with a total of 9.4MW), and through the implementation of a targeted acquisition strategy resulting in the acquisition of the Neuville-sur-Ain plant, with a capacity of 2.5MW, in 2020.

EDF intends to pursue this development dynamic by aligning itself fully with the goals set by the PPE for hydropower development.

This goal is being leveraged in a number of ways:

- increasing the capacity of infrastructures managed under concession: a provision in the French Energy and Climate Act of 8 November 2019 (now Article L. 511-6-1 of the French Energy Code) made it possible to use a declaration procedure to implement a capacity increase, subject to a number of conditions, including acceptance by the administrative authority in question;
- major projects are also being developed to address energy transition requirements, as well as the growing need to compensate for very low water levels in view of climate change. STEPs thus play a major role in energy transition and in integrating variable power sources in the French electricity system. EDF fully intends to enhance this hydro power asset *via* its storage plan, both in France and internationally. In particular, EDF is studying several STEP projects based on existing installations. In particular, EDF is heading up a major project in the La Truyère Valley, extending the La Truyère and Lot Amont concessions to address storage requirements. It was submitted by the French State in April 2017 to the European Commission. An authorisation in principle is awaited prior to the formal notification process.
- development of hydro power projects in France's overseas departments and territories to address the needs identified in these localities' multi-year energy programs (PPE);
- continuing to develop reserve-flow turbines and new projects for equipment planned, in particular in the Loire and Dordogne Valleys;
- continued development of the "small hydropower" segment in metropolitan France (corresponding mostly to small and medium-output installations, producing less than 12MW for the most part, but sometimes up to 20-30MW), in two ways. The first aspect involves improving the performance of this segment within the existing fleet by providing dedicated asset management for these 237 plants (generation capacity of 5.5TWh in 2019), with the goal of securing a sustainably positive financial trajectory. The second aspect aims to achieve an additional 30MW from this segment by means of acquisitions and some disposals, and developing so-called greenfield projects, notably as part of CRE calls for tender.

Regional anchoring in hydropower valleys

EDF has always taken care to ensure the sustainable and shared development of the hydropower valleys and the economic regions close to generation facilities. These regions, often rural and sometimes isolated, are always looking to adapt to the changes in their environment: economic, societal or even climatic.

EDF has a clear commitment to strong local roots in this respect, combining a stance as a responsible concession manager based on dialogue with co-building alongside all stakeholders, supporting local economic development through its "*Une rivière, un territoire*" ("One River, One Territory") agencies.

EDF's "responsible hydroelectric concession manager" policy is characterised by collaborative work with economic, political, and non-profit stakeholders, together with residents living close to the hydro power infrastructures being operated.

It is structured around two main pillars:

- maximising economic outcomes of hydroelectric activity for "hydro territories", thus providing networks of local industrial resources (supplier panels list over 1,000 local companies specialising in various hydro lines of business), together with local services that benefit all stakeholders in the valley. In this respect, the assessment of the employment footprint of EDF's hydroelectric activity in metropolitan France suggests the existence of some 3,994 indirect jobs;
- as well as ongoing dialogue with stakeholders in "hydro territories", mainly through:
  - consultation (the ASTER artwork project, a fresco to painted on the front of the Saint Etienne de Cantales dam, was the subject of broad consultation with a large number of local stakeholders),
  - the use of dialogue, measurement, and information tools concerning the footprint of significant worksites based on the "*Chantier d'Avenir*" ("Worksite for the Future") policy (the renovation of plants on the Rhine and the construction of a fish pass at the Malause dam, Tarn-et-Garonne,
  - or the development of day-to-day, multi-service information and data exchange interfaces (development of services and coverage of "*Ma Rivière & Moi*" (My River and Me) application for several valleys in the Alps, Pyrenees, and the Massif Central).

The local commitment aspect of EDF's hydropower activities also took on a very special dimension in 2020, due to the Covid-19 crisis. EDF helped with the economic recovery of "hydro territories" through major support for summer tourism:

- the development of exceptional activities, in particular through industrial tourism focusing on our dams and reservoirs, included in local tourism projects;
- special care for the shores of dammed lakes to support water sports;
- and lastly, enhanced mobilisation to ensure the safety of the very large numbers of visitors to river banks in the summer of 2020, in particular through the hydro-guides scheme.

In 2012, EDF launched a dedicated "One River, One Territory" programme. Since 2013, this local programme has created or maintained over 500 jobs in the valleys by means of loans to over 50 local companies. This involves the creation or preservation of some 800 jobs by 2023. The 8 "One River, One Territory" agencies roll out action strategies tailored to their respective localities, aimed at:

- integration through (and benefiting) employment;
- developing sustainable economic activity in the valleys;
- assisting public and private-sector project promoters;
- and developing innovation in these largely rural areas.

Against the exceptional backdrop of the health crisis and its economic consequences, "One River, One Territory" launched two specific support procedures in the spring of 2020:

- a "recovery loan" (*prêt rebond*) scheme was organised, aimed primarily at supporting the cashflow of our service providers and essential players in the economic and social life of our valleys, with funds totalling €1 million available until the end of 2021;
- furthermore, the "One River, One Territory Fund" (which helps local businesses with loans) organised specific aid for companies in its portfolio, agreeing to postpone their loan repayment instalments by 3-6 months. In addition, one-off local initiatives to bring forward orders or make financial gifts were put into place.

(1) See EDF's press release dated 9 October 2020 "EDF commissions its new Romanche-Gavet hydroelectric plant (Isère)".

Managing access to water

Regulatory notice

Regulation applicable to the balanced management of water resources

EDF's hydropower generation business is subject to the substantive provisions of water regulations. Such regulations cover in particular control over variations in water levels and flow rates, the safety of areas in the vicinity and downstream of hydropower facilities and, in general, maintaining balanced management of water resources.

The dams operated by EDF in France provide storage capacity for nearly 7 billion cubic metres of water. As well as generating electricity, hydro power infrastructures are also used to help with water management, and thus represent a major contribution by EDF to local life and economic development.

Over and above being a hydropower supplier, EDF is therefore also engaged as a contributor to the sustainable management of water resources, for instance by supporting river water levels during periods of drought.

These initiatives are undertaken by EDF to benefit aquatic environments and other uses of water in the Garonne, Aude, Ardèche, Vienne, and Moselle river basins. In a basin of the Garonne river that is particularly affected by increasingly frequent episodes of drought, in July 2020 EDF entered into a new low-water compensation agreement with local water stakeholders. This agreement makes it possible to increase hydropower reservoir volumes dedicated to supporting the Garonne by 36%, through an innovative compensation scheme set up by EDF.

EDF also maintains water levels commensurate with tourism at major reservoirs, allowing the development of recreational activities and the tourist economy as part of concerted policy initiatives. Similarly, EDF ensures certain rivers have water levels that can accommodate sports and leisure activities such as canoeing and kayaking.

The Durance-Verdon and Saint-Cassien (Alpes-Maritimes) reservoirs also play a fundamental role in crop irrigation in Provence and the drinking water supply for the French Riviera.

Water management is carried out in consultation with the various stakeholders; in some cases, this includes agreements with local councillors, fishermen, farmers, and the managers of tourist destinations and industrial sites. EDF is thus very much a stakeholder in local water management governance. For instance, EDF has set up an innovative "Basin coordinator delegate" scheme, so that all EDF's business lines have representation in water-related authorities such as basin committees and water agency Boards of Directors, on behalf of the UFE (*Union française de l'électricité*). This representation and coordinated action within EDF as regards water management ensures its business is sustainable and nurtures shared management of water resources.

EDF is constantly seeking to minimise the impact of its infrastructures on aquatic biodiversity, abiding by reserved flow levels, fitting infrastructures with fishways on listed waterways, and adapting operating procedures where fragile environments so dictate.

1.4.1.3.2 Other renewable energies

1.4.1.3.2.1 Biomass and biogas

Through its holdings, the Group holds shares in France (notably through its subsidiary Dalkia, see section 1.4.6.1.1 "Dalkia") and abroad in several dozen heating networks and small-scale, mainly wood-fired generating plants, and has been committed for several years now to the development of anaerobic digestion, with the biogas produced used both in cogeneration and for direct injection into the natural gas distribution network.

1.4.1.3.2.2 Geothermal energy

To develop this type of energy, EDF is using its subsidiary Électricité de Strasbourg, which operates two industrial facilities in Alsace: one for heat at Rittershoffen, Ecogi, for a local industry, and the other for power generation, at Soultz-Sous-Forêts.

1.4.1.3.3 EDF Renewables activities

Apart from hydropower, the EDF group's involvement in renewable energy is largely conducted by its a wholly-owned subsidiary EDF Renewables. The companies in the EDF Renewables group had a workforce of 3,949 employees at 31 December 2020.

EDF Renewables has the expertise required to ensure EDF group's expansion in renewable energy, and is fully engaged in the renewables market dynamic, with a strong presence in onshore and offshore wind power, as well as accelerating its solar power business.

EDF Renewables is also expanding into the storage sector, in line with EDF's Storage Plan, which calls for 10GW of fresh capacity by 2035, including 4GW from large-scale batteries.

EDF is also present in the decentralised renewable energy sector (rooftop solar power) for domestic and corporate customers, with operations both in France (through its subsidiary EDF ENR) and abroad, in particular in the United States, China, and the United Kingdom.

EDF Renewables has seen marked growth in installed capacity (up 8.7%/year on average over the past five years). As of 31 December 2020, EDF Renewables had gross installed capacity of 13,788.5MW, net installed capacity of 8,662.8MW and 8,061.8MW gross currently under construction. The project portfolio totalled 60.2GW at the end of 2020. The EDF group aims to achieve net installed capacity in renewables (excluding hydro power) of 21.3GW by 2024.

With operations in over 20 countries, EDF Renewables is one of the benchmark players in the development and production of electricity from renewable energy sources, in particular in its main historic locations of North America (USA, Canada, and Mexico) and Europe, mainly in France and the United Kingdom. EDF Renewables has also rebalanced its business in geographical terms, increasing its presence in other countries with high potential for the development of renewable energy, including Brazil, China, India, UAE, Saudi Arabia, Morocco, and Egypt.

EDF Renewables is an integrated operator in renewable energies and is involved in every stage of the value chain. EDF Renewables operates upstream, in project development, as well as in engineering during the construction of power plants and their operation and maintenance. EDF Renewables develops projects on its own or in partnerships, as appropriate. At the end of 2020, wind power and solar power comprised 74% and 26% of EDF Renewables holdings respectively; EDF Renewables has embarked on rebalancing its business from a technology standpoint.

As part of its business model, the Group is also involved in the Development and Sale of Structured Assets (an activity referred to as "DSSA"), which consists of selling projects it has built, in whole or in part, to third-party investors. With regard to DSSA, the net capacity sold in 2020 amounted to 1,406.3MW.

1.4.1.3.3.1 Fleet

INSTALLED CAPACITY BY SEGMENT AND COUNTRY

	At 31/12/2020		At 31/12/2019	
(in MW)	Gross [1]	Net [2]	Gross [1]	Net [2]
Wind				
South Africa	110.6	55.8	110.6	55.8
Germany	175.3	173.3	187.3	185.3
Belgium [3]	325.2	26.9	325.2	26.9
Brazil	329.0	238.0	182.0	182.0
Canada	560.2	506.2	784.7	618.4
Chile	115.0	57.5	115.0	57.5
China	617.3	215.7	219.3	102.6
Denmark	6.0	6.0	6.0	6.0
United States	3,618.1	2,803.2	3,424.5	2,605.4
France	1,695.1	1,527.8	1,652.6	1,485.3
Greece	264.5	238.2	264.5	238.2
India	269.0	176.5	269.0	176.5
Italy	39.8	25.2	39.8	25.2
Mexico	324.0	162.0	391.5	229.5
Portugal	546.5	148.9	546.5	205.0
UK [4]	602.5	187.4	591.7	184.6
Turkey	559.0	279.5	661.6	267.4
Total Wind power [5]	**10,156.9**	**6,828.1**	**9,771.6**	**6,651.6**
Solar power				
Brazil	398.5	199.3	398.5	199.3
Canada	61.4	42.4	61.4	42.4
Chile	261.0	130.5	261.0	130.5
China	117.0	113.1	98.3	79.1
Egypt	148.6	65.2	130.0	65.0
United Arab Emirates	1,065.2	170.4	660.2	105.6
United States	533.9	379.6	151.8	151.8
France	278.0	219.4	334.5	210.8
Greece	12.1	12.1	12.1	12.1
India	207.0	99.7	207.0	99.7
Israel	323.9	220.3	295.1	192.5
Mexico	119.6	119.6	119.6	119.6
Turkey	36.4	18.2	36.4	18.2
Total Solar power [5]	**3,562.6**	**1,789.7**	**2,766.0**	**1,426.6**
Storage				
United States	20.0	20.0	20.0	20.0
United Kingdom	49.0	25.0	49.0	25.0
Total Storage [5]	**69.0**	**45.0**	**69.0**	**45.0**
TOTAL (5)	**13,788.5**	**8,662.8**	**12,606.6**	**8,123.2**

(1) Gross capacity: total capacity of the facilities in which EDF Renewables has a stake.
(2) Net capacity: capacity corresponding to EDF Renewables' stake.
(3) MW in offshore wind exclusively.
(4) EDF Renewables owns 51% of EDF Renewables UK (the other 49% is owned by EDF Energy), see section 1.4.5.1 "United Kingdom".
(5) Corresponds to the sum of the exact values rounded to one decimal place.

In 2020, the electricity production of EDF Renewables' fully consolidated fleet across all segments and countries was 23.4TWh. The load factor reached at end 2020 30% in onshore wind power generation and 16% in solar power generation.

1.4.1.3.3.2 Segments and highlights

For details of renewables activities in Italy and Belgium, see sections 1.4.5.2 "Italy" and 1.4.5.3.1 "Northern Europe" respectively.

Wind power

Onshore wind power

During the course of 2020, EDF Renewables actively pursued its development in onshore wind power, thus contributing to EDF group's CAP 2030 strategy. EDF Renewables had a gross total of 9,420.2MW onshore wind power capacity in operation as of the end of 2020. Onshore wind farms with a gross capacity of 2,395.7MW were commissioned in 2020, onshore wind farms under construction represented a gross capacity of 2,380.4MW at 31 December 2020.

France

EDF Renewables pursued its development in wind power, commissioning almost 54.5MW more in 2020, in wind farms in Fontaine (13.2MW), Allainville (16.9MW), Petit Canal (9MW) and Mottenberg (15.4MW). In addition to these new capacities, several wind farms are under construction for a total of some 146.8MW.

In 2020, EDF Renewables continued with the construction of the "*Beaujolais Vert*" project (12MW), the first wind farm in the Rhône *département*. EDF Renewables was awarded 74MW of wind farm projects in CRE calls for tender (Champ Gourleau, Longues Roies, Telegraphe, Sud Arrageois, Mottenberg).

United Kingdom

In 2020, EDF Renewables commissioned the Burnfoot East wind farm, with a capacity of 10.8MW.

Poland

EDF Renewables launched the construction of three wind farm projects, with a total capacity of 68MW; these were awarded in calls for tender at the end of 2019.

United States

In March 2020, EDF Renewables and Alliant commissioned the Golden Plains wind farm project in Iowa, with installed capacity of 200MW.

In October 2020, EDF Renewables and Pedernales Electric Cooperative Inc. (PEC) signed a 15-year power purchase agreement (PPA) for a 100MW share in the King Creek 1 project (Texas). Construction began at the end of 2020.

Brazil

Phase 1 of the Folha Larga Norte wind farm in the State of Bahia, Brazil, under construction since 2019, was commissioned in the second half of 2020. Phase 2 will be commissioned in 2021. This new project, comprising 82 wind turbines and installed capacity of 344MW, will result in EDF Renewables having wind power projects totalling 526MW in operation in Bahia. EDF Renewables has been operating in Brazil since 2015, and is one of the country's leaders in the renewable energy industry. EDF Renewables also owns the Ventos da Bahia wind farm located in the municipalities of Bonito and Mulungu do Morro, with a total capacity of 365MW, including 182MW under construction.

Saudi Arabia

In 2020, EDF Renewables (lead contractor) continued with the construction of the Dumat Al Jandal project in a consortium with Masdar and Nesma. With installed capacity of 416MW, this will be by 2022 the first such wind farm in Saudi Arabia and the most powerful one in the Middle East.

Morocco

EDF Renewables and Mitsui & Co. Ltd., an international trading and investment group with a diversified business portfolio, commenced the worksite for the first phase of the Taza wind farm (87MW) in northern Morocco.

Offshore wind power

Offshore wind power represents a strong area in EDF Renewables' development. The company already has operations on the offshore wind power market, with 6.5GW of projects under development, under construction, in service, or under management and maintenance. EDF Renewables has operations in Europe (Germany, Belgium, France, Ireland, United Kingdom), where it is the ninth largest player, with 1.4GW of projects under construction. It is also present in China, and has positioned itself in the United States.

France

EDF Renewables is the offshore wind power leader, with four out of seven projects awarded in the calls for tender launched by the French State.

- It won three projects in 2012, namely the offshore wind farms in Fécamp, Saint-Nazaire and Courseulles-sur-Mer. Together they make up a capacity of nearly 1,430MW and cost around €6 billion. All relevant permits for the three wind farms were granted. The partnership arrangement brings together EDF Renewables, Enbridge, and wpd for the Fécamp and Courseulles-sur-Mer projects. For the Saint-Nazaire project, EDF Renewables is associated with Enbridge.

  In 2018, the French government confirmed these three offshore wind power projects. The construction of the Saint Nazaire wind farm begun in September 2019 continued in 2020.

  In June 2020, EDF Renewables and its partners together signed the finance agreements with the financial partners of the Fécamp offshore wind farm and commenced construction [(1)].

  The construction of the Courseulles-sur-Mer offshore wind farm started in February 2021.

- The Dunkirk project was won in June 2019. The future Dunkirk wind farm will have installed capacity of some 600MW. The successful consortium consists of EDF Renewables, Innogy, and Enbridge. It will carry out the design, construction, operation, and maintenance of the future offshore wind farm. In the last quarter of 2020, a public debate was held on the project in meetings in Dunkirk; this was then continued online due to the lockdown due to the health crisis. The EDF Renewables project team and RTE contributed to it under the auspices of the independent administrative authority supervising the public debate (CPDP).

EDF Renewables is also conducting a pilot offshore wind farm project (*Provence Grand Large*) in the Mediterranean, based on floating wind power technology.

United Kingdom

In 2020, EDF Renewables continued the construction of the Neart na Gaoithe offshore wind farm in partnership with Irish electricity company ESB. This 450MW project is located in the Firth of Forth on the eastern coast of Scotland.

United States

At the end of 2018, EDF Renewables set up a 50-50 joint venture, Atlantic Shores Offshore Wind, LLC, with Shell New Energies U.S. llc (Shell). The purpose of this joint venture is to develop offshore wind turbines on a site located in the New Jersey wind energy area (WEA) under a lease issued by the US federal authorities. The area covered by the lease has a potential for wind power generation of about 2,500MW. The area offers strong and steady wind resources in relatively shallow water, close to large population centres with high electricity demand. In December 2020, the joint venture submitted a bid in the call for tender launched by the State of New Jersey to install between 1,200MW and 2,400MW of offshore wind turbines.

Ireland

In 2020, EDF Renewables positioned itself in Ireland by acquiring 50% of the Codling offshore wind project, in partnership with Fred Olsen Renewables Ltd., in order to develop and build this future offshore wind project [(2)]. With a potential of 1GW, this project is located south of Dublin, 13km off the coast of County Wicklow.

China

In 2020, EDF (EDF Renewables and EDF China) and China Energy Investment Corporation (CEI) announced that they ealed their industrial partnership with the final joint venture agreements for offshore wind power projects with total capacity of 502MW located off the coast of Jiangsu Province, north of Shanghai, China [(3)]. The new joint venture operates the Dongtai IV wind farm and is currently constructing the Dongtai V project.

(1) See EDF Renewables' press release dated 2 June 2020 "EDF Renewables, Enbridge and wpd start construction of the Fécamp Offshore Wind Farm ".

(2) See EDF Renewables' press release dated 11 February 2020 "The EDF group moves into Ireland by acquiring 50% of the Codling offshore wind project".

(3) See EDF Renewables' press release dated 2 June 2020 "EDF and CEI Groups join hands for offshore wind projects under construction and operational in China ".

Photovoltaic solar power

EDF Renewables continued to expand in solar power with a view to rebalancing different technologies. At end 2020, gross installed solar capacity was 3,562.6MWp (1,789.7MWp net), up by 796.6MWp net *i.e.* 29%, compared to end 2019.

EDF Renewables also has a portfolio of solar projects under construction of 3,816.6MWp gross.

France

EDF Renewables has structured its policy for contributing to the Solar Plan launched by the Group in December 2017 and aimed at making EDF one of the leaders in solar photovoltaic energy in France, with a 30% market share by 2035. In order to step up its growth in solar power, EDF is implementing a strategy covering all market segments, based on an integrated development model for projects up to their operation, the quest for industrial excellence and continued investment in innovation. This strategy leverages EDF's research and development and the territorial networking of EDF's teams dedicated to local authorities and businesses. The lands targeted as a priority are sites referred to as "damaged", *i.e.* industrial wastelands, polluted, abandoned or former quarry sites, which can be rehabilitated with the development of photovoltaic projects.

Since announcing its Solar Plan, EDF has successfully completed the preparatory phase and commissioning of the Plan. In 2019, EDF Renewables acquired the LUXEL Group, an independent solar energy player in France, thus expanding its portfolio of operational and projected solar farms. In 2020, EDF Renewables positioned itself as one of the top three developers of ground-mounted solar projects by being awarded a total of 190MWp of capacity in calls for tender organised by the CRE (26MWp in April in the Haut-Rhin 2 call for tender; 41MWp in April in the "CRE 4.7" call for tender; 8MWp in April in the "ZNI" call for tender; 105MWp in October in the "CRE 4.8" call for tender; and 11MWp in December in the "Innovation" call for tender). Furthermore, EDF's portfolio of solar projects in France includes 492MWp of authorised projects and 2,500MWp of projects for which land had been secured as of the end of 2020.

Innovation also supports the development of solar power, notably in the form of projects for floating power plants. Lazer, the first floating solar plant of the EDF group on the Buëch, in the Hautes Alpes, was selected for the ground-based solar call for tenders launched by the Ministry of Ecological and Solidarity Transition. Solar panels of a maximum power of 20MWp will be installed on 24 hectares on the hydroelectric reservoir *i.e.* three-quarters of the water body's total area.

Some projects include a crowdfunding campaign, enabling the inhabitants of a region to be involved with the funding of the projects in question. Examples include two solar power plants, Ambes (9MW) and Artix (4MW), with a campaign aimed at raising €200,000 from inhabitants of Gironde and Pyrénées-Atlantiques. Another example concerns three solar power plants to be commissioned in 2021 located in the municipalities of Lagnieu, Loyettes, and Samognat. A total of €300,000 was raised through the Lendosphere digital investment platform.

United States

EDF Renewables and Nucor Corporation, a diversified steel company, signed a 15-year power purchase agreement for 250MWac of solar energy in Texas. The project is due to be commissioned in the second quarter of 2023.

EDF Renewables North America and Geenex Solar signed an agreement for a portfolio of 4.5 gigawatts of solar projects at various stages of development in the United States [(1)].

At the end of the year, the North American subsidiary also commissioned two solar power plants, Maverick 1 and 4, for a total of almost 310MW. These facilities are located in California.

United Kingdom

2020 was the year when EDF Renewables launched into ground-mounted solar power in the United Kingdom, with the development of various solar projects and the signature of a partnership with Octo Energy. The aim is to identify sites in England and Wales with a view to developing hybrid solar projects and storage.

In October 2019, EDF Renewables signed three Power Purchase Agreement (PPAs) with Tesco, one of the leading retail chains in the United Kingdom. These three agreements are for a total volume of 60MW of installed capacity from 17 roof-mounted solar systems under construction in the UK.

Ireland

In 2020, EDF Renewables continued its development in Ireland with the acquisition of Wexford Solar Limited and a portfolio of over 100MW of solar projects. In addition, EDF Renewables was awarded 30MW of projects in the summer of 2020.

Greece

EDF Renewables is continuing its development in solar power in Greece, being awarded 80MW of projects in 2020 (80MW in 2019).

India

EDF Renewables is developing its solar power business in India through EDEN Renewables India, a joint subsidiary created for this purpose in 2016 by EDF Renewables and Total EREN (formerly EREN Renewable Energy). In 2019, EDEN signed four electricity sales contracts in northern India for total capacity of 716MWp, 450MW of which were under construction in 2020.

In 2020, EDEN was awarded three solar plant projects for a total of 1,350MW in Rajasthan, northern India [(2)].

United Arab Emirates

EDF Renewables joined the consortium led by Masdar to develop the "DEWA III" project which is the third phase (800MWac) of one of the most powerful solar farm projects in the world, the Mohammed bin Rashid Al Maktoum solar farm, which is being developed in partnership with Dubai Electricity and Water Authority (DEWA) near Dubai. The plant was commissioned in three stages (2018, 2019, and 2020).

In July 2020, the consortium formed by EDF Renewables and Chinese company Jinko Power Technology Co. Ltd. won the call for tender for the Al Dhafra solar power project [(3)]. The future solar power plant will be located 35 kilometres south of the city of Abu Dhabi. With installed capacity of 2GW, it will be the most powerful in the world, supplying electricity to the equivalent of 160,000 local households each year. At the end of the year, the consortium finalised the funding of the project for approximately one billion dollars.

Morocco

In 2019, EDF Renewables, in a consortium with Masdar and Green of Africa, successfully bid for the first phase of the Noor Midelt I solar project in Morocco, using a hybrid solar-storage technology that is a world first. This hybrid solar project with installed capacity of 800MW innovatively combines two technologies: concentrated solar power (CSP) and photovoltaic solar power.

Operating & Maintenance

As an integrated operator, EDF Renewables operates and maintains most of its own wind and solar facilities. Dedicated first and foremost to EDF group wind and solar assets, this activity is also carried out on behalf of third parties. Worldwide, EDF Renewables operates 17GW at end-December 2020 with nearly 1,200 experts, engineers and technicians across nine countries. EDF Renewables has long been active in the operation-maintenance field in North America where it manages close to 13GW. The business in Europe and the rest of the world exceeds 4GW at end 2020.

This activity is driven by commissioning new plants and choosing which facilities to operate on a case-by-case basis according to technology and region. The aim is to achieve maximum efficiency in every facility in conjunction with providers throughout the expected or extended useful life of equipment.

Accordingly, EDF Renewables recently set up a predictive maintenance oversight centre (e-Diagnostic Center) drawing on specific in-house expertise centralised and coordinated with the EDF group's R&D Department. It complements the facility remote monitoring and control system made up of three real-time oversight centres in Colombiers (France), Emden (Germany) and San Diego (California).

(1) See EDF Renewables' press release dated 16 October 2020.

(2) See EDF Renewables' press release dated 1 October 2020 "EDEN Renewables India increases its portfolio with 1,350MWp of new solar photovoltaic power plants".

(3) See EDF Renewables' press release dated 27 July 2020 "EDF – Jinko Power consortium is awarded the world's largest solar project in Abu Dhabi".

Since 2017, EDF Renewables owns a subsidiary specialising in the operation and maintenance of offshore wind farms, the German firm Offshore Wind Solutions GmbH (OWS). OWS operates and maintains the BARD Offshore 1 wind farm (400MW) located 95km off the German coast in the North Sea.

EDF Renewables owns several European maintenance centres: in Belgium, Greece, United Kingdom, Germany and France. These operation-maintenance units are designed to place technical teams as close to wind or solar farms as possible to ensure faster response times and thus operational performance.

Decentralised Energy

France

EDF ENR is an integrated player in decentralised solar power production, carrying out design, development, construction, operation, and maintenance of rooftop and car park canopy installations. A wholly-owned subsidiary of the Group, it markets solar power offers for domestic customers, professionals, and local authorities in metropolitan France and overseas departments and territories. With over 35,000 facilities completed, EDF ENR now occupies a leading position. On the domestic market, it carries out some 30% of all self-consumption installations in France. On the professional market, the offering features in the "*EDF Solutions Energétiques*" catalogue, under the responsibility of business market sales teams.

In addition, EDF Renewables Technologies, a wholly-owned subsidiary of EDF Renewables, is present in the upstream segment. It owns 100% of EDF ENR PWT (Photowatt brand) which designs and manufactures photovoltaic modules using crystalline silicon technology with various applications ranging from residential equipment to land-based solar farms. Since late 2018, Photowatt has been rolling out a new industrial model focusing on low-carbon production of high-technology silicon wafers and ingots. Alongside this joint project, Photowatt focuses on its R&D activities, renamed Photowatt Lab, in conjunction with the EDF group's R&D Department and solar energy research centres such as INES or the Photovoltaic Institute of Ile-de-France region with a view to fostering the emergence of new technology in the field of photovoltaic cells and modules and testing it in pre-industrial conditions.

United States

EDF Renewables is engaged in a growth strategy in the USA on the decentralised energy market. A number of acquisitions have fuelled growth since 2016. Following the acquisition in 2016 of Global Ressources Options, Inc. (groSolar), which specialises in the installation and sale of photovoltaic plants for local authorities, service companies and industrial players, in 2018, EDF Renewables North America entered into a strategic partnership with EnterSolar, a leading supplier of solutions for the decentralised generation of solar energy for commercial and industrial (C&I) customers. This partnership concerns the EDF Renewables equity investment in EnterSolar to the tune of 50%. It will allow both companies to offer C&I customers the most comprehensive range of solutions for "behind the counter" decentralised electricity generation and to capitalise on the sharp growth in demand for decentralised generation solutions from the C&I sector.

In 2019, EDF Renewables North America acquired PowerFlex Systems with the aim of speeding up large-scale deployment of infrastructures for electric vehicles in the USA. Based in Los Altos, California, PowerFlex System is a pioneering firm in the field of charging technology. This acquisition has allowed the creation of a unique decentralised energy ecosystem combining smart charging solutions for electric vehicles and power charging for buildings, together with solar power production and storage facilities.

China

In 2018, EDF Renewables together with Asia Clean Capital (ACC), one of the main developers in China of rooftop photovoltaic installations for local businesses and multinationals, launched a joint venture aimed at building and operating a portfolio of decentralised solar energy projects on rooftops. The joint venture shall leverage the local reputation of ACC as a key decentralised solar player in the country and the international expertise of EDF Renewables in decentralised solar power and in self-consumption solutions for industrial players. In 2019, EDF Renewables acquired a majority stake in an asset portfolio comprising 77MWp of rooftop solar power installations with Asia Clean Capital.

Storage sector

In 2018, the Group launched an Electricity Storage Plan which provides for the installation of 10GW new storage facilities for electricity systems by 2035, to which EDF Renewables contributes.

In a context marked by the strong growth of renewable energy generation and by the closure of large-scale electrical facilities, battery storage technology, combined with a smart control system, helps smooth out the generation of electricity of the national grid. In this context, through its subsidiaries, EDF Renewables develops innovative storage systems in the US, the United Kingdom, Germany and France.

In 2015, for instance, EDF Renewables North America commissioned an innovative storage system: The McHenry facility provides nearly 20MW of capacity (40MW of dynamic capacity) and helps monitor an energy reserve to stabilise the frequency of the electricity grid at a local level.

In 2018, EDF Renewables commissioned the battery storage system with a capacity of 49MW located in the West Burton B plant in Nottinghamshire in the UK. This facility is the most important project of the new frequency control system to be rolled out across the entire UK. The objective is to improve electricity grid stability and quickly respond to grid frequency fluctuations.

In 2018, EDF Renewables also signed two twenty-year power purchase agreements in the US relating to the construction of the Big Beau Solar+Storage solar project, in California (see section "Solar photovoltaic power North America"), and connected to the battery storage system of 40MW (160MWh).

In 2019, EDF Renewables bought out UK startup Pivot Power, specialising in battery electricity storage and charging infrastructures for electric vehicles. The EDF group is already the UK's leading producer of low-carbon electricity; this acquisition will now enable it to become one of the country's leading battery storage installers, too.

Lastly, the Noor Midelt I solar power project in Morocco is a major project for the storage industry (see section 1.4.1.3.3.2 "Solar power").

France

In 2020, EDF Renewables became a partner of Ecosun Innovations, taking a 29% stake in its share capital [(1)]. This French startup, located in Alsace, develops innovative "microgrid" solutions to provide electricity in remote areas. In particular, Ecosun Innovations markets a range of solar plants in mobile containers, equipped with storage batteries.

In French Guiana, EDF Renewables also commissioned the Toucan II solar power plant (5MW), equipped with a smart battery storage system.

United States

In 2020, EDF Renewables announced the signature of a 22-year Power Purchase Agreement (PPA) with NV Energy for a project comprising 200MWac of solar power along with a 180MW 4-hour battery storage system[(2)]. The Chuckwalla Solar+Storage project should be commissioned by the end of 2023 and supply enough clean electricity each year for 45,000 average households in Nevada.

EDF Renewables signed a storage contract with CleanPowerSF. The 100MWac Maverick 6 solar project in California will now be connected to a 50MW, 4-hour battery storage system. The project should be commissioned by the end of 2021.

Germany

In 2020, EDF Renewables launched an innovative storage offering for industrial customers. In partnership with Malteurop, a world leader in malt production, EDF Renewables commissioned two new battery storage systems, located on the Rostock and Heidenau sites.

(1) See EDF Renewables' press release dated 28 September 2020 "The EDF group invests in the startup EcoSun Innovations and strengthens its microgrid offer".

(2) See EDF Renewables' press release dated 29 July 2020 "EDF Renewables signs a contract for 200MW solar + storage 180MW/4hr project in Nevada".

1.4.2 Sales and supply activities in France

Besides gas and electricity supply, EDF accompanies its customers through energy efficiency and services offers as well as new decentralised energy solutions. EDF aspires to be a trusted partner for customers, engaging in responsible marketing and providing simple, intelligible offers.

28.7 million	243.3 TWh	32.6 TWh
CUSTOMER SITES IN FRANCE (1)	ELECTRICITY SALES IN 2020 (2)	GAS SALES IN 2020 (3)

(1) EDF Customer Division + Électricité de Strasbourg; electricity: 26.9 million, gas: 1.9 million.
(2) EDF Customer Division (excluding transfers to local distribution companies) + Électricité de Strasbourg.
(3) EDF Customer Division + Électricité de Strasbourg.

EDF's sales and supply activities in France (excluding overseas departments and Corsica) are managed by the Customer Division.

1.4.2.1 Presentation of the market in France

1.4.2.1.1 Competition

Since 1 July 2007, the French market for electricity and gas has fully opened-up each customer able to choose their energy supplier.

Over the last five years, the number of active electricity suppliers in France excluding historical suppliers has doubled from 24 at end-2015 to 43 at 30 June 2020 (1) according to the market observatory of the Energy Regulation Commission (CRE).

In the electricity and gas markets many suppliers have been proposing offers to businesses and local authorities since the early 2000's. For residential customers, competition has intensified significantly since 2017 with the entry into the market of gas and electricity suppliers well established in other activities or geographical areas.

To supply their customers in 2020, EDF's alternative suppliers had access to their own generation capacities as well as to the wholesale electricity market and the ARENH for around 100TWh. During the November 2020 application process, the demand from alternative providers reached 146.2TWh for an ARENH distribution volume of 100TWh (see also section 1.4.3.3 "Regulated Access to Historic Nuclear Energy (ARENH))".

Regulatory notice

Regulated tariffs

Pursuant to French Act 2019-1147 of 8 November 2019 on energy and the climate (known as the "Energy-Climate Act"), regulated tariffs for the sale of gas ceased at the end of 2020 for professional clients consuming less than 30MWh/year and will come to an end on 30 June 2023 for domestic consumers, pursuant to procedures detailed in the Act. For details about the end of regulated tariffs for the sale of electricity in France ("TRV", or "blue" tariffs) for some professional customers, see note 5.1.1 in the notes to the 2020 consolidated financial statements.

The Energy Regulation Commission (CRE)

The CRE is an independent administrative authority. Its responsibility is to ensure the proper workings of the electricity and natural gas markets for end consumers. In this respect, the CRE ensures, in particular, that the conditions for access to electricity and natural gas transmission and distribution networks do not impede the development of competition.

The CRE has significant powers: the power to make proposals, advisory powers and decision-making powers (approval power and regulatory power). The CRE makes proposals, in particular:

- to the Ministers for the Economy and for Energy regarding the amount of the costs that are attributable to the public service missions assigned to power producers, and the net amount of the related contributions;
- once the Decree has been published that specifies the methods for identifying and recognising the costs that are taken into account for the calculation of the ARENH price, the ARENH price.

Moreover, it has been the CRE's responsibility to send its reasoned proposals for changes in the regulated sales and transfer tariffs for electricity to the Ministers for the Economy and for Energy.

The CRE has decision-making power to establish Tariffs for Using the Public Electricity transmission and distribution Networks (*Tarifs d'Utilisation des Réseaux Publics de transport et de distribution d'Électricité,* TURPE).

Under its residual regulatory power, the CRE also takes network connection decisions, as well as decisions to define the rules for calculating and adjusting the rights of suppliers to the ARENH.

The CRE is also vested with very broad powers that enable it to obtain any information that it may deem useful for the fulfilment of its remit, as well as authority to settle disputes and to apply penalties, through the Settlement of Disputes and Sanctions Committee (CoRDiS).

The Law on Energy Transition for Green Growth also gives the CRE the possibility of having the information it obtains through its remits audited, at the expense of the audited undertakings.

Organic Law no. 2017-54 of 20 January 2017 on Independent Administrative Authorities and Independent Public Authorities and Law no. 2017-55 of 20 January 2017 on the General Statute of Independent Administrative Authorities and Independent Public Authorities, provided these authorities, including the CRE, with a common legal status and lay down the rules relating to the mandate and ethics of members, the operation and organisation of these authorities and parliamentary control. The Energy and Climate Law no. 2019-1147 of 8 November 2019 modifies the composition of the CRE council.

(1) Providers who say they have offers available in at least 90% of all municipalities in metropolitan France connected to the grid (excluding Corsica). At 30 June 2020, just over 100 non-national electricity providers were also active within this area.

1.4.2.1.2 Regulated electricity sales tariff contracts

Access to regulated electricity tariffs

For details of the changes to the legal and regulatory framework for regulated electricity sales tariffs in France ("TRV" or "blue" tariffs), see note 5.1.1 in the notes to the 2020 consolidated financial statements.

Since the Energy-Climate Law entered into force, the situation for electricity, by category of customer, is as follows:

- domestic final consumers who have subscribed power for their site(s) not exceeding 36kVA: these customers benefit from regulated sales tariffs. They can freely switch back and forth between regulated tariffs and market offers;
- for non-domestic end consumers with subscribed power levels of 36kVA or less, only consumers with fewer than 10 employees and a turnover, total revenue, or balance sheet of less than €2 million will still be able to benefit from regulated sales tariffs after 31 December 2020. Consumers that do not fall into this category will lose the benefit of regulated tariffs on 31 December 2020, following the process described by the law;
- domestic and non-domestic final consumers who have subscribed power for their site(s) exceeding 36kVA: since 1 January 2016 these sites can no longer subscribe to regulated sales tariff products which were cancelled on 31 December 2015;
- domestic and non-domestic final consumers for their site(s) located in areas not connected to the continental metropolitan network: these customers have the right to regulated sales tariffs.

Regulatory notice

"Blue tariffs" – tariff changes

In accordance with Articles L. 337-4 of the French Energy Code, the CRE has been responsible for notifying the Ministers for the Economy and for Energy of its justified proposals for regulated electricity sales tariffs (TRV). If no objections are made within three months, the proposals are deemed to have been approved.

With respect to 2020 tariff changes, the CRE proposed to the government [(1)], that residential and non-residential "Blue tariffs" be increased by 2.4%, including tax. *i.e.* 1.5% corresponds to making up, within 2 years, the delay in the tariff coming into effect in 2019, and 0.9% corresponds to taking into account costs relating to the construction of regulated sales tariffs for electricity: wholesale prices for capacity and power, the effects of ARENH capping, and changes in marketing costs, including the costs of Energy Savings Certificates. The French Energy Regulation Commission (CRE) proposal was confirmed [(2)] and implemented on 1 February 2020.

Thereafter, the tariff level of summer 2020 was also changed in accordance with this process: given the change in TURPE on 1 August 2020 and pursuant to the French Energy Code, the CRE proposed in a deliberation dated 02 July 2020 a reduction of 1.54% including tax in residential blue tariffs and an increase of 1.58% including tax in non-residential "Blue tariffs". The French Energy Regulation Commission (CRE) proposal was confirmed [(3)] and implemented on 1 August 2020.

1.4.2.1.3 Electricity supply contracts

In France, domestic and non-domestic customers [(4)] with subscribed power levels of less than 36kVA are entitled to regulated sales tariffs, and may also choose a market offer put forward by any supplier, including EDF.

With the exception of customers directly connected to the transmission network, who must sign separate supply and delivery contracts, all other customers may enter into a single contract with the supplier. In this regard, a commission is paid by the distributor to any supplier offering a single contract to its customers since in doing so, it provides customer management services on behalf of the distributor.

The quality of supply, which is the distributor's responsibility, is monitored on a regular basis under contracts with the distributors. EDF monitors the impact of outages and the quality of supply to its customers and their satisfaction with the aim of working with the distributor on a continuous improvement basis (see section 1.4.4.2.2 "Distribution activities").

1.4.2.2 Activities of the Customer Division

EDF's Customer Division brings together all business relating to the sale of electricity, gas, and related services in mainland metropolitan France. It also performs all customer management functions, including the management of customer requests *via* all channels (telephone, email, etc.), complaints handling, invoicing, and debt recovery. The activity spans all customer segments: domestic consumers, professionals, companies, and local authorities. For larger customers (industry and service sectors), energy services are mainly marketed and provided by Dalkia (see section 1.4.6.1.1 "Dalkia").

The Customer Division operates on the basis of recognised fundamentals:

- constantly seeking to further strengthen consumer confidence;
- local presence in the form of 6,200 customer advisers, all based in France, and its 8 Regional Commercial Divisions;
- permanent innovation in digital technology, electric mobility, self-consumption solutions, and electricity flexibility.

1.4.2.2.1 Activity by customer category

1.4.2.2.1.1 Domestic customers

EDF is innovating on a daily basis; Domestic customer satisfaction is a priority: approximately 9 out of 10 customers are satisfied with their relationship with EDF following telephone contact. The annual report of the French national energy mediator published in June 2020, shows that EDF has the lowest rate of disputes, far behind its main competitors. The customer experience offered is both digital (customer space, chat, web call back, mobile application, digital solutions, social media, etc.) and human. 5,000 advisers, all based in France, are attentive to the needs of customers and offer them personalised advice.

Energy supply

EDF supplies electricity at the regulated sales tariff (TRV) and offers a comprehensive range of market offers in electricity. To offer even more choice to its domestic customers in 2020, EDF extended its electricity market offering; as of the end of 2019, this comprised the "*Mes Jours Zen*", "*Mes Jours Zen Plus*", "*Vert Électrique*", "*Vert Électrique Weekend*", "*Vert Électrique Auto*", and "Digiwatt" offers. Thereafter, in January 2020, EDF launched "*Vert Électrique Bretagne*" ("Electric Green Brittany") its first electricity offering allowing its customers to support the production of green electricity in Brittany, France [(5)]. "*Vert Électrique Bretagne*" addresses the expectations of the large number of people in France who are keen to support production of energy of local origin and who are committed to the environment, allowing them to support specific wind farms in Brittany. *Vert Électrique Bretagne* customers can be assured that the entire output of these sites is purchased by EDF group, together with the related guarantees of origin.

In order to broaden its portfolio of gas customers, EDF has launched a new offer, "*Avantage Gaz Optimisé*" ("Optimised Gas Advantage"), indexed at 2% below the price per kWh before VAT of regulated gas tariffs (TRG). This offer further extends the existing range of three gas offers. "*Avantage Gaz*" offers a fixed price per kWh (before VAT) for a period of four years. Over and above the characteristics of the "*Avantage Gaz*" offer, "*Avantage Gaz Durable*" offers carbon offsetting based on the customer's estimated gas use. Lastly, "*Avantage Gaz Connecté*" gives customers the possibility of managing their heating remotely and enhancing their comfort with the purchase of a connected thermostat.

(1) *Via* the decision of 16 January 2020 published on 24 January 2020.
(2) Through tariff ruling on 29 January 2020, published in the French Official Journal on 31 January 2020.
(3) Through tariff ruling on 29 July 2020, published in the French Official Journal on 31 July 2020.
(4) Eligibility conditions defined in the 29 January 2020 decision on regulated electricity sales tariffs applicable to non-residential consumers in mainland France.
(5) See EDF's press release of 29 January 2020, "EDF's Vert Électrique Bretagne offer allows clients to support the production of green electricity in Brittany, France."

Features and services

In parallel with its supply offers, EDF assists its Domestic customers so they can monitor and understand their energy use, encouraging them to make energy savings using "*Mes Éco et Moi*" digital solutions [1]. Customers who consult their energy use tracking tool more than 2-3 times a month can achieve savings of up to 12% on their bills [2].

EDF, in partnership with AXA, offers a comprehensive range of support services, called "*Solution Dépannage Confiance*" with three rapid repair options applying to external electricity and gas installations (electricity & gas option), electricity, gas & water installations and plumbing/locksmith problems (home option) and equipment (equipment option). Also in partnership with AXA, EDF offers "*Assurénergie*" which allows customers to benefit from a flat rate reimbursement to enable them to pay their energy bills in the event of difficulties (loss of employment, inability to work, hospitalisation, invalidity or death).

For general information about the help provided to customers during the health crisis, see "EDF, a responsible business during the sanitary crisis" in the introduction to chapter 3.

Launched by EDF in 2019, the local services platform *IZI by EDF* emerged in 2020 as a player in energy renovation and electric mobility, in particular following the buyout (at the end of 2019) and subsequent integration of mychauffage.com. In addition to the offers developed in 2019 (emergency repairs, minor works, indoor renovations, and boiler maintenance), *IZI by EDF* now has a turnkey energy renovation offer focusing on heating solutions (heat pumps and boilers), insulation, ventilation, and window installation (including calculation and deduction of all regulatory aid from the customer quote), as well as a finance solution and a strong commitment to quality.

IZI by EDF also offers a full-service solution to transition to electric mobility, including the installation of a home charging station, green electricity supply with "*Vert Électrique Auto*", the "*pass mobilité*" (operated by IZIVIA) mobility pass to recharge anywhere in Europe, and electric vehicle leasing. See also section 1.4.6.1.4 "Other service activities of the EDF group" – "IZI by EDF".

As part of the "*Coup de Pouce Chauffage*" [3] scheme, EDF launched in January 2019 its "*Mon chauffage durable*" offer, to finance replacing ageing heating systems by more efficient ones. This may involve replacing a legacy fossil fuel-fired boiler (gas, fuel) with a heat pump, or replacing last-generation radiators with environmentally efficient models. This offer goes further than the state scheme, offering a complementary bonus. Households may also benefit from preferential rate financing up to 0% rate, provided by EDF's financial partner, covering entire cost of the project [4].

EDF helps its consumers access household appliances with good environmental performance in a partnership with Samsung. In 2020, this enabled over 4,000 customers to benefit from an EDF promotional code on over 5,000 products.

In May 2020, EDF launched "Check", a smartphone-based removals assistant. Check is a web-based app that is as easy to use as any standard app, providing users with a personalised checklist to ensure nothing is forgotten, facilitating hassle-free removals, and offering advice for a successful house move. Customers who take out an energy contract with EDF also have access to special offers negotiated with leading partners in the removals business, household appliances, decoration, and building works.

Lastly, EDF is investing in open innovation with "EDF Pulse & You", a digital collaborative platform for co-construction with internet users and startups. In particular, the platform allows connected objects to be co-built, application interfaces to be improved, and social acceptability of soft mobility to be accelerated, optimising the wellbeing of tomorrow's users amid energy transition.

Earning of energy savings certificates (CEE)

Implemented in 2006, the energy savings certificates (CEEs) scheme was amended on 1 January 2018. The national obligation for the fourth period (2018-2020) was fixed at 1,600TWhc, of which 400TWhc for households in a situation of energy poverty. The Decree no. 2019-1320 of 9 December 2019 extended the fourth period from three to four years, increasing the obligation proportionally to the duration, *i.e.* 2,133TWhp for the 2018-2021 period.

EDF is of necessity an actor in energy savings certificate legislation, and encourages domestic customers to make energy savings, particularly by promoting home energy renovation through its Energy Savings Partners and distributor networks. All residential customers who made energy efficiency alterations to their home qualify for a direct cash bonus from EDF by visiting www.prime-energie.edf.fr, subject to providing the information and documents required pursuant to the CEE regulation in force.

Solidarity policy

Solidarity is a core value of EDF, which has been pursuing a policy dedicated to economically disadvantaged customers for close on 30 years (see section 3.3.4. "Energy poverty and social innovation").

1.4.2.2.1.2 Business customers

EDF and business customers

EDF is firmly rooted in local territories and is committed alongside its Business and Local Authority customers to hastening the achievement of their aims in sustainable performance, competitiveness, and carbon neutrality. EDF innovates to serve its customers and uphold high standards of quality and reliability, both in the public interest and to secure its stakeholders' long-term trust.

EDF products

EDF offers a range of competitive and low-carbon electricity and gas supply offers to companies and professionals, geared to each customer's expectations and types of energy use.

For small businesses and professionals, EDF provides straightforward contracts combined with management services, enabling customers to focus on the business whilst optimising their energy supply. For those customers using more energy, contracts can be personalised (with specific durations and fixed or indexed prices) based on their expectations and budget forecasting capabilities. Lastly, EDF is able to tailor solutions for the heaviest users depending on the structure of their consumption.

EDF structures its products to encourage its customers to optimise consumption according to generation costs by offering different prices for peak hours and off-peak hours and even summer and winter prices for heavier users during these times of year. This year, EDF also launched an innovative offer for professionals with low prices during evenings after 8pm, at weekends, and on public holidays, using the potential offered by smart meters.

EDF offers all its customers across all its products the option to choose electricity from renewable sources to cover their consumption. For small and medium sized enterprises and professionals, it involves a specific offer, the renewable energy contract, which provides guarantees that 100% of their consumption will come from electricity generated from renewable energy sources and facilitates their communication with their own customers regarding their commitment. For larger customers, it involves an option that allows them to decide themselves what proportion of their consumption will come from guaranteed sources, between 20% and 100%.

EDF has a diversified range of solutions and services intended for all its electricity and gas customers, whether small companies or large industrial customers: online consumption monitoring, electronic invoices, assistance and troubleshooting, advice (optimisation of subscribed power, efficiency and reduction of energy expenses, etc.), in particular for customers who want to use an energy management system.

(1) Available via the website customer space and the "EDF and Me" application.

(2) Internal survey, EDF R&D.

(3) The initiative was launched on 14 January 2019.

(4) Subject to using one of EDF's 2,000 Energy Savings Partners and to examination and acceptance by EDF's financial partners Domofinance.

EDF has put into place offers dedicated to large customers, not only with tailor-made electricity and gas supply offers and offers that reward customers that can shed load, but also support controlling their energy consumption and their CO_2 emissions as well as CO_2 trading for businesses subject to the national quota allocation plan.

Lastly, in order to assist its customers with the energy transition, EDF gets involved into the promotion of eco-gestures by means of awareness-raising campaigns. EDF carries out energy audits for its customers in order to help them better identify the possible energy savings. The EDF's certified teams assist their customers with the implementation of energy management systems (ISO 50001).

EDF also works with its Business and Local Authority customers as they seek to engage directly in energy transition. Optimised solar power solutions for self-consumption of electricity may be offered based on their needs, together with a range of related services, including financing, maintenance, supervision, and performance monitoring, in liaison with its subsidiary EDF ENR. EDF also has new offers for its self-consuming customers to complement their electricity supply tailored to their profile, whereby they can maximise their savings from self-generation and, where necessary, manage their consumption.

EDF is also innovating by experimenting with services and technical systems aimed to facilitate the organisation and management of collective self-consumption operations; EDF is engaged in several pioneering operations in France. For instance, for major-account customers, EDF develops bespoke supply solutions that include PPA (Power Purchase Agreement) supply from operators of renewable-origin electricity production facilities, in particular *via* its subsidiary Agregio.

EDF also supports its Business and Local Authority customers' electric mobility projects, in the form of advice about the dimensioning of installations and through the sale and rental of electric charging stations and related services, *via* its subsidiary IZIVIA. EDF has also concluded partnerships with automotive leaders and manufacturers.

Earning of energy savings certificates (CEE)

In addition, EDF encourages its industry, services, and local authority customers to achieve energy savings by carrying out work on industrial processes and insulating collective and tertiary premises. EDF contributes to the fulfilment of EDF's "social insecurity" goals by liaising with social landlords and renovating their housing stock. By funding Economy Savings Certificates ("CEE") programmes, EDF also raises awareness of ecological transition and eco-mobility among young people.

Customer satisfaction

EDF has made customer satisfaction a key priority for many years. In a rapidly changing environment, it has undertaken major changes to significantly and constantly improve Customer Experience and the quality of service provided.

To achieve this, EDF has implemented a customer support scheme covering every step of Customer Relations, thereby anticipating changes and expectations in terms of the supply of energy, services, information, and assistance. This policy resulted in a significant rise in overall satisfaction for all EDF customer segments in 2017, stabilising in 2018, 2019 and 2020, with 90% to 91% of all customers reporting they were satisfied or highly satisfied. Those results were highlighted in the annual report of the French national energy mediator published in June 2020, which shows that EDF has the lowest rate of disputes, far behind its main competitors.

EDF and regional authorities, social housing landlords, local distribution companies (ELDs) and public service providers

Regarding energy transition, EDF offers customised solutions for local authorities and public institutions with decentralised decision-making powers (hospitals, universities and major graduate schools, chambers of commerce and industry, CROUS student service centres, ports and airports).

The EDF group is active for these customers in three areas:

- the supply of electricity and gas at market price, responding to their energy problems (proposal of offers and solutions adapted to the needs described in calls for tender);
- the development of offers and services in terms of energy transition: local climate plans, eco-districts, local generation, road lighting, electric mobility, energy efficiency of buildings, etc.;
- in addition, with respect to its public service missions, EDF is in charge of:
  - the conclusion of concessions agreements to supply electricity at the regulated sales tariff,
  - the supply of electricity at the regulated sales tariff,
  - the fight against energy poverty.

In 2020, overall satisfaction of "*EDF Collectivités*" customers is 93.7%, *i.e.* more than 9 customers out of 10 satisfied or very satisfied.

Managing energy consumption with local authorities

Agreements covering local demand-side management have been entered into with local authorities. In addition, local authorities with the power to make decisions in the area of energy arrange specific actions in their region in matters concerning control of energy transitions and renewable energies. A "Load Amount" device for social-housing lessors aims to improve the energy efficiency of social housing, and makes it possible for EDF to issue energy savings certificates. In 2020, 130,000 social housing homes received assistance for renovation works. EDF also funds Economy Savings Certificates programmes, in particular for local authorities (*e.g.* positive energy regions and "Watty at School").

1.4.2.2.2 For sustainable cities and regions

Cities and regions have to reconcile local appeal with responsible development. EDF addresses the needs of local development stakeholders by identifying the various energy solutions and services available in the light of projects' technical and economic characteristics, assisting with energy transition and low-carbon strategies. EDF has developed a range of consultancy offerings with a view to designing low-carbon neighbourhoods, developing housing stock renovation strategies based on an asset strategy, vehicle fleet electrification, and charging station location plans with its subsidiary IZIVIA, and installing solar panels with its subsidiary EDF ENR or other partners. 45 Development Mangers are present across all regions so that EDF can better meet the needs of large cities, urban communities, medium sized cities, rural areas.

1.4.2.2.3 Customer data protection

The protection of data belonging to EDF customers is a major component of the Customer Division's action plan to secure assets/goods and information systems. Special attention is paid in particular to compliance with data processing regulations (General Data Protection Regulation – GDPR), which is regularly audited. EDF has drawn up a memorandum of instructions, interlocking with Group policies, devoted to personal data protection. EDF curates the classification of information and documents on the basis of their degree of confidentiality and ensures commensurate security measures are implemented. All customer advisers have been informed of this, so that they can respond to requests relating to personal data protection and the exercise of related rights.

All Customer Division advisers are issued with laptop computers and secure remote access facilities. Surface encryption is activated on all adviser workstations. Requests by customers to exercise their rights are usually managed jointly with the Data Protection Officer (DPO).

1.4.2.2.4 Public electricity distribution concessions at regulated tariffs

Regarding concession contracts, see section 1.4.4.2.2 "Distribution activities" – "Concessions".

1.4.3 Optimisation activities in France

Since electricity cannot be stored, EDF has to supply just the right amount of electricity, matching customer demand, at all times, at best cost. The aim of optimisation is to predict this demand and implement the necessary trade-offs between the resources available to satisfy demand (production resources, long-term supply contracts, purchases on wholesale markets, etc.). Optimisation of EDF's production also consists in covering physical, financial, and market risks.

Regulatory notice

Wholesale energy market – REMIT regulation

Regulation (EU) No. 1227/2011 (REMIT regulation) on the integrity and transparency of wholesale energy markets entered into effects on 28 December 2011 and is designed to enhance consumers and market players confidence in the integrity of electricity and gas markets.

Strengthening wholesale energy market integrity and transparency must foster open and fair competition on these markets, in particular so that prices set on these markets reflect a fair and competitive interplay between supply and demand. The regulation prohibits insider trading and market manipulation, and establishes an obligation to publish inside information as defined in the REMIT.

The European Agency for the Cooperation of Energy Regulators (ACER) is primarily responsible for monitoring wholesale trades in energy products, in order to detect and prevent transactions based on inside information and market manipulations. ACER also collects the data needed to assess and monitor markets. The regulation provides that market participants, or a person authorised to do so on their behalf, provide ACER with a detailed statement of the transactions in the wholesale energy market.

Market participants that perform transactions for which a declaration to ACER is mandatory must register with the national regulatory authority of the Member State in which they are established (the CRE in France) or, if they are not established in the European Union, that of a Member State in which they do business.

At a national level, national regulation authorities also work together and monitor wholesale energy product trading; Member States determine the regime for sanctions applicable to REMIT breaches.

In France, the applicable regulations are as follows:

- the Brottes Act 2013-312 of 15 April 2013 entrusts the duty of ensuring REMIT is observed to the CRE, and the responsibility for sanctions for REMIT breaches to CoRDiS (the CRE's Sanctions and Dispute Settlement Commission);
- Order 2016-461 of 14 April 2016, specifying the remit of the CRE in terms of collecting information, registration, and the obligations of persons organising professional transactions;
- Order 2020-891 of 22 July 2020 on procedures brought before CoRDiS (based on Article 57 paragraph II of French Act 2019-1147 of 8 November 2019 on energy and the climate).

1.4.3.1 Role and activities of the Upstream/Downstream Optimisation & Trading Division (DOAAT)

The balance between electricity supply and demand is managed right down to a real-time basis, in line with the framework established by risk policies, developed in line with the Directives issued by the Group's Risk Control Department and validated by EDF's Executive Committee (see section 2.2.2 "Financial and market risks", risk factor 2C "Energy market risk"). Climate variations affect this management. Hence, a fall in temperature of 1°C in winter leads to a rise in electricity consumption in France of the order of 2,400MW [(1)] and EDF's portfolio bears a large part of this thermosensitivity. In addition, depending on the run-off, the amplitude of hydraulic generation in the EDF scope, between one extreme year and another, can amount to around 20TW hours.

The DOAAT ensures that it has, in all timeframes, sufficient resources in order to enable it to meet its commitments. To do this, it manages a set of leveraged actions:

- scheduling of maintenance operations of generation means (in particular nuclear);
- management of inventory (fossil fuels, hydro-electric reserves and customer load shedding);
- purchases and sales in wholesale markets *via* EDF Trading, which is in charge of market access on behalf of DOAAT (see section 1.4.6.3 "Optimisation and trading: EDF Trading").

DOAAT also manages the exposure of EDF's upstream/downstream portfolio to price variations in the energy and fuel (gas, coal, petroleum products) wholesale markets and in the CO_2 emissions licensing market, with the assistance of EDF Trading.

With respect to RTE, DOAAT plays the role of "balance responsible entity" on EDF's perimeter in mainland France. In this regard, EDF is committed to financially compensate RTE in the case of a deviation onto its balance group. The optimisation consists of offering RTE an offer schedule that is balanced with the demand, which makes it possible to minimise the supply cost of EDF's contractual commitments.

1.4.3.2 Long-term electricity purchase and sales contracts

EDF maintains commercial relations through energy purchase or sales contracts with European operators. These contracts are of many types, and confer:

- rights to the energy generated by facilities, primarily nuclear, over the duration of the exploitation of the facility (see section 1.4.1.1.2.1 "EDF's nuclear fleet in France and its operation");
- drawing rights for totally or partially guaranteed electrical power, for a duration generally comprised between 15 and 25 years.

(1) Source: RTE.

1.4.3.3 Regulated Access to Historic Nuclear Power (*Accès Régulé à l'Énergie Nucléaire Historique*, or ARENH)

Implemented on 1 July 2011, the ARENH scheme grants alternative suppliers the right to purchase electricity from EDF to supply their end clients, once a framework agreement has been entered into, at a regulated price for set quantities determined in line with the provisions laid out in the French Energy Code. This mechanism can also be accessed by network operators for their losses. The CRE [(1)] is responsible for managing the mechanism and for calculating entitlements of which it notifies the co-contracting parties. Thus, suppliers wishing to exercise their right to access the ARENH can do so by submitting a request to the CRE. The detailed consumption forecasts, along with the entitlements calculated for each supplier, are only known to the CRE and the supplier. The payments are managed by the Caisse des Dépôts.

The price of the ARENH, determined by the Minister of Energy and the Minister for the Economy, upon proposal by the Energy Regulation Commission (CRE), has been maintained at €42/MWh since January 2012. It includes the supply of electricity and the issue of the related capacity certificates. The maximum ARENH overall volume that can be sold to suppliers, which make a request to cover the needs of the ultimate customers, is set at 100TWh per year.

France's "Climate and Energy" Act introduces new provisions that allow the government to alter the total ARENH amount up to a ceiling of 150TWh and, for a transitory period, revise the ARENH price by means of an Order. Article L. 337-16 of the French Energy Code also specifies that changes in the consumer price index and in the maximum global amount that may be transferred may be taken into account when revising the ARENH price. However, no direct link is established between any increase in the price and any increase in the maximum overall quantity. In any case, the French Ministry for Ecological and Solidarity Transition has announced that neither the ARENH price not the quantity would be changed in 2021.

ARENH demand for 2020 amounted to 147TWh. In view of the maximum global quantity being exceeded, the CRE carried out capping of alternative supplier demand. In 2020, EDF supplied 100TWh to alternative suppliers for the needs of their end clients, plus 26.2TWh to offset losses by network managers.

ARENH demand for 2021 came to 146.2TWh. Alternative supplier demand capping mechanisms were therefore implemented by the CRE. In 2021, EDF will supply 100TWh to meet the needs of alternative suppliers and customers, plus 26.3TWh to offset losses by network managers.

The capping of ARENH requests from alternative suppliers is mirrored in the regulated tariffs for electricity sales, pursuant to the method adopted by the CRE in its resolution dated 11 January 2018.

Pursuant to CRE resolutions nos. 2019-237 of 30 October 2019 and 2020-277 of 12 November 2020, all ARENH quantities requested by subsidiaries controlled by EDF for 2020 and 2021 were also capped. In view of this, EDF and its subsidiaries have implemented contracts that mirror the ARENH terms of supply (See also section 2.2.1 "Market regulation: political and legal risks", risk factor 1B "Changes in the regulatory environment (ARENH, regulated sales tariffs, environmental legislation, and SNBC (national low carbon strategy)").

1.4.3.4 Capacity mechanism

Articles L. 335-1 *et seq*. of the French Energy Code, originating from the NOME Law, institute the obligation for each electricity supplier to contribute in mainland France to the security of electricity supply, in compliance with a default criterion set by the government. For this purpose, each supplier must acquire capacity guarantees corresponding to its obligation, calculated by reference to the power and energy consumption of its customers during a peak period defined by RTE.

To comply with this obligation, each supplier must therefore get capacity guarantees from producers, which must certify all their means of generation, or from demand response managers.

Once up and running, a number of auctions to exchange capacity will be held, beginning four years before the delivery year and ending three years thereafter. Over-the-counter transactions remain possible.

Similarly, for integrated players such as EDF, which possess capacities as producers and have an obligation as vendors, internal capacity transfers are authorised in order to cover their obligations. They will be made at the market price.

The DOAAT, in charge of the management of this system, proceeds with the certification of all the EDF means of production in France for the next few years. If necessary, these certifications will be the subject to regular rebalancing, either upwards or downwards. As on the energy market, the sales/purchases of capacity managed by the DOAAT on behalf of EDF, are carried out *via* EDF Trading.

Market reference prices for 2017, 2018, 2019 and 2020 were respectively set at €10.0/kW, €9.3/kW, €17.4/kW and €19.5/kW.

For delivery year 2021, the six market sessions in 2020 revealed the following prices, in chronological order: €19.5/kW, €19.22/kW, €47.4/kW, €29.5/kW, €32.7/kW, and €39.1/kW.

2020 saw a major increase in capacity prices for 2020 and subsequent years, from the June session onwards. This was due mainly to the reduced availability of the fleet in this period amid the Covid-19 crisis.

1.4.3.5 Specific balancing and capacity perimeters for Purchase Obligations and sales to markets

EDF is a mandatory purchaser of the electricity generated by the generation facilities the government wishes to support and develop (renewable energy sources and energy efficient cogeneration). By law (Article L. 121-7 of the French Energy Code), the additional costs stemming from this obligation are offset for EDF on the basis of an electricity market benchmark price (concept of "avoided cost").

Following the CRE resolution of 16 December 2014, all electricity purchased in this manner is managed within a dedicated "balancing perimeter" for installations subject to Purchase Obligation (OA) agreements, implemented on 1 July 2015. The DOAAT organises the sale of the energy produced by the installations under Purchase Obligation contracts directly on the energy markets, which makes the management of this perimeter completely independent of that of the EDF portfolio. Thus, since 4 November 2015, electricity volumes under Purchase Obligations that can be forecast over the short-term (one day for the next, known as the "random component of the Purchase Obligations") are sold on EPEX Spot. As for the volumes which are foreseeable over the long term (share of the Purchase Obligations referred to as "quasi certain"), since January 2016 they have been sold *via* transparent and non-discriminatory requests for bids.

Similarly, within a dedicated Purchase Obligation perimeter, the Upstream-Downstream Optimisation & Trading Division (DOAAT) carries out certification of the capacity of production installations subject to Purchase Obligations, together with the necessary rebalancing and sales to the market of the related capacity guarantees.

Since 1 January 2017, the management costs for this public-service mission have also been offset.

(1) French Energy Regulatory Commission.

1.4.4 Regulated, transmission and distribution activities in France

Power transmission and distribution activities in mainland France are the remit of transmission system operator (RTE) for high and extra high voltages, and distribution network operators (Enedis and LDCs in their respective exclusive service areas) for medium and low voltage.

RTE and Enedis are independently managed subsidiaries within the meaning of the provisions of the Energy Code.

1.4.4.1 Transmission – Electricity Transmission Network (RTE)

106,047 km	50	449TWh	€1,529 million
HIGH AND EXTRA HIGH VOLTAGE CIRCUITS	CROSS-BORDER LINES	DELIVERIES IN 2020	INVESTMENTS IN 2020

Created on 1 July 2000 and a subsidiary since 1 September 2005, the Electricity Transmission Network (RTE) is the owner and operator of the French electricity transmission network, which it operates, maintains and develops. With over 106,000 kilometres of high and extra high voltage circuits and 50 cross-border lines at end-2020, this is continental Europe's largest network. Its geographical location places it at the core of the European electricity market. RTE guarantees the correct operation and safety of the electricity system, and provides free and fair access to all the network users. The company pays special attention to supporting the development of renewable sources of energy in France and their integration into the electricity system, which requires the development of the transmission network and interconnections.

RTE is indirectly owned (50.1%) by EDF (*via* CTE) at 31 December 2020. Due to its specific conditions of governance, RTE is not fully consolidated by the Group, but rather accounted for using the equity method.

1.4.4.1.1 Governance of CTE and RTE

CTE

CTE is a public limited company (*société anonyme*) with a Board of Directors, owned by EDF (50.1%), Caisse des Dépôts et Consignations (29.9%) and CNP Assurances (20%). CTE holds 100% of the share capital of RTE. In accordance with its articles of association, the sole purpose of CTE is the acquisition and holding of RTE shares, and more generally, all commercial, financial, intangible and tangible property transactions relating directly or indirectly to its corporate purpose or which might facilitate its achievement or stimulate business growth.

CTE Board of Directors is composed of eight members, appointed for a term of six years, including four EDF representatives, two Caisse des Dépôts et Consignations representatives and two CNP Assurances representatives. RTE's Compliance Auditor General also attends meetings of CTE's Board of Directors.

RTE

RTE is a public limited company (*société anonyme*) with both an Executive Board and a Supervisory Board.

RTE's Supervisory Board is comprised of twelve members appointed for five years:

- eight members appointed by the Shareholders' Meeting:
  - the French State as a legal person (represented by a natural person, in turn designated by a ministerial order) and a State administrator,
  - six representatives of the shareholder CTE (three representatives of EDF, two representatives of the Caisse des Dépôts et Consignations and one representative of CNP Assurances);
- four members elected by and representing the employees.

On 31 August 2020, the terms of office of the Supervisory Board ended. RTE's Shareholders' Meeting appointed the eight members of the Supervisory Board representing the shareholder and the French State for a 5-year term commencing on 1 September 2020. The four employee representatives were elected by RTE employees for a 5-year term, also commencing on 1 September 2020.

Other individuals attend Supervisory Board meetings but are not members:

- a Government Commissioner attends Supervisory Board meetings in a consultative capacity, in accordance with Article 15 of Order no. 2014-948 of 20 August 2014 regarding governance and trading in French State-owned companies;
- an Auditor General (CGEFi), from the CGEFi "EDF and other energy sector bodies", appointed by Order of 7 July 2018, also attends the meetings of the Supervisory Board, in application of French Decree no. 2018-580 of 4 July 2018 relating to RTE "Réseau de Transport d'Électricité" being subject to the economic and financial control of the French State;
- the Secretary of RTE's Central Social and Economic Committee (Comité Social et Économique Central, CSEC) attends meetings of the Supervisory Board pursuant to Article L. 2312-75 of the French Labour Code (*Code du travail*);
- a Compliance Auditor General attends the meetings of RTE Supervisory Board, in application of Article L. 111-35 of the French Energy Code.

RTE's Managing Board is made up of five members, who perform their work under the supervision of the Supervisory Board, within the limits fixed by the French Energy Code and RTE's articles of association. After the consent of the Energy Minister, the Supervisory Board appoints the President of the Managing Board and upon the latter's proposal, it appoints the other members of the Managing Board.

The terms of office of the Managing Board also ended on 31 August 2020. The Supervisory Board appointed Mr Xavier Piechaczyk as President of the Managing Board for a 5-year term commencing on 1 September 2020. On the proposal of the latter, the other members of the Managing Board were appointed by the Supervisory Board for a term commencing on 2 November 2020 and ending on 31 August 2025, at the same time as the term of the President of the Managing Board. The Managing Board comprises the President and Mrs Thérèse Boussard, Managing Director of the Infrastructure Management Division; Mrs Clotilde Levillain, Managing Director of the Customers Market & System Division; Mrs Sophie Moreau-Follenfant, Managing Director of the Transformation and Employees Workplace Division and Mr Laurent Martel, Managing Director of the Finance and Purchasing Divisions.

1.4.4.1.2 RTE's activities

In France, RTE manages the public transmission network and carries out its missions under the conditions set out in model specifications approved by applicable decree until 2051. In accordance with the French Energy Code, transmission network operators must be certified according to a process associating the CRE and the European Commission, which aims to ensure that the entity concerned fulfils the conditions of independence set out by this Code. RTE obtained certification from the CRE in 2012 as an ITO (Independent Transmission Operator) as confirmed in a decision of the CRE dated 2 July 2020.

Thus RTE manages the transmission infrastructure, guarantees the access to the transmission network and manages energy flows.

RTE has had to face a variety of challenges in its mission as an electricity transmission network operator: integration of the European market, extensive restructuring of the generating fleet, societal changes reinforcing the constraints of integrating new infrastructure of common interest and maintenance of its industrial facilities to meet the requirements of customers and the community at large.

On 16 March 2020, RTE, a "critically important operator", triggered its business continuity plan to ensure continuity of all its business amid the Covid-19 health crisis.

Regulatory notice

Tariff for Using the Public Transmission and Distribution Networks (TURPE)

Pursuant to Article L. 341-3 of the French Energy Code, the tariff for using the public electricity transmission network is set by way of a reasoned decision by the CRE. Set by the CRE's decision of 17 November 2016, published in the French Official Journal on 28 January 2017, TURPE 5 HTB came into force on 1 August 2017 for a period of four years, with an initial increase of 6.76%. This initial increase was followed by an inflation-based change on 1 August of each year (apart from corrections arising from the income and expense regularisation account). On 1 August 2020, the tariff change was -1.08%.

A new tariff period will begin in August 2021 for a period of four years. The CRE's decision of 21 January 2021 on the TURPE 6 HTB tariff (with a view to publication in the French Official Journal in the first quarter of 2021) sets the framework, structure, and level of this new tariff. It provides for an initial increase of 1.09% on 1 August 2021 and an average increase of 1.57% annually for the period (based on the scenario of average annual inflation of 1.07% for the period).

The financial return of RTE assets is the result of the product of the regulated asset base (RAB) and a nominal rate before tax. This rate of return took the value of 6.125% for the TURPE 5 tariff period. For the TURPE 6 tariff period, the tariff decision set the rate of return at 4.6%. On 1 January 2021, the RAB amounts to €14.5 billion [(1)]. The value of the RAB includes RTE's commissioned industrial assets, minus investment subsidies and is calculated excluding assets under construction (which are remunerated at the debt rate, *i.e.* 3.7% until 2020 in application of the TURPE 5 tariff and 2.4% from 2021 in application of the TURPE 6 tariff).

Third-party access to the network

Article L. 111-91 of the French Energy Code provides that network managers must guarantee access to the public transmission and distribution networks, notably in order to:

- perform the public service missions to supply electricity at regulated electricity sales tariffs and at basic necessity special rates;
- perform electricity procurement contracts;
- perform electricity export agreements signed by a producer or by a supplier located on French national territory.

Disputes concerning third-party access to networks are heard by the Settlement of Disputes and Sanctions Committee ("CoRDIS"), which is part of the Energy Regulation Commission (CRE).

1.4.4.1.2.1 Maintenance of the transmission infrastructure

RTE manages the assets of the transmission network through maintenance, refurbishment and replacement of structures and emergency repairs.

The gradual integration of new technologies, in particular monitoring, will make it possible to optimise technical policy and to develop conditional and predictive maintenance, further enhancing the effectiveness of each intervention by limiting action to what is strictly necessary. Digitalisation of the grid and large-scale monitoring will make it possible to carry out remote diagnosis and deploy new maintenance technologies such as drones, 3-D visualisation, and augmented reality. Alongside this, test and simulation software will provide decision support for grid management. Massive data analysis will allow new asset management strategies to be developed, with the potential to achieve a different balance between maintenance, renovation, and renewal.

1.4.4.1.2.2 Development and completion of new capital investments

Energy transition is changing the fundamentals of the French electricity system. In response, RTE is adapting its business to prepare and support these major changes.

Each year, RTE draws up an annual investment programme that is submitted to CRE's approval. In 2020, against the backdrop of the Covid-19 health crisis, RTE continued with most of its investments. Postponements of operations to be performed were limited, thanks to the actions undertaken to continue business during lockdown and the proactive rescheduling of interventions.

In 2020, RTE's total investments within the scope regulated by the CRE stayed at a high level of €1,529 million. The main investments relate to:

- the continuation of construction works on two direct current interconnections ("Savoie-Piedmont" between France and Italy and "IFA 2" between France and the UK);
- the launch of connection works for the future offshore wind farms of Fécamp and Saint-Brieuc;
- the continuation of the connection works of the Saint-Nazaire offshore wind farm;
- the reconstruction of the 400,000V Avelin-Gavrelle line between the south of Lille and the north-west of Arras (started in 2019);
- the resumption of the Haute-Durance programme (securing supply to the Haute Durance Valley).

RTE's 2021 investment programme approved by CRE amounts to €1,717.6 million. This conveys the implementation of the trajectory presented in the ten-year plan for development of the network (*Schéma décennal de développement du réseau,* SDDR) to support energy transition and changes arising from EU market integration. The investment programme is characterised by ongoing major investments in grid expansion and renewal, more especially the progress of offshore network development works, continuation of major grid adaptation projects, as well as the development and renewal of IT systems and real estate.

1.4.4.1.2.3 Operation of the electricity system

Management of the electricity system

RTE manages the flows on the transmission network in real time and makes use of the resources available to it through the adjustment mechanism to ensure the balance between supply and demand in real time. The cost corresponding to the adjustments made by RTE and due to the negative differences between the projected flows and those already realised is passed on to the "Balance responsible parties" (producers, traders, suppliers, etc.) in proportion to their difference. In the case of a positive difference, RTE compensates the balance responsible entities financially.

Management of the interconnections

RTE manages access to international interconnections in collaboration with the neighbouring European transmission network operators. These interconnections ensure the transmission of energy from one country to another, the operating safety of the electricity transmission networks and the development of the European electricity market. They ensure that electricity market players can sell and purchase their energy in another European Union country, by taking advantage of the price differences on either side of the border, and can better pool the means of generation at the European level (including renewable energies).

Network coordination in Europe

In December 2008, RTE and Elia [(2)] created a common company named Coreso, which aims to coordinate the operation of electricity networks comprising France and Belgium. The creation of Coreso fulfils the need of reinforcing the operational coordination between transmission network operators (TNO) expressed both by the European Commission and by the players of the electricity market. Coreso must allow better integration at the regional level of generation from renewable sources and guarantee secure management of rising cross-border flows.

(1) Amounts to be conformed by the CRE.

(2) Elia is the Belgian electricity transmission network operator for high voltage (from 30,000 to 380,000 Volts).

RTE and Elia were then gradually joined by grid operators in Western Europe: National Grid ESO (UK), Terna (Italy), 50 Hertz (North-East Germany), REN (Portugal), REE (Spain) and recently Eirgrid and SONI (Ireland).

The implementation of network codes and the new regulations for the French internal electricity market have led to the establishment of regional Coordination Centres, thus making the role of entities such as Coreso in their operational coordination of network managers in Europe official. Consequently, Coreso is currently in the process of being legally designated as the Regional Coordination Centre for the different capacity and operation calculations involving France.

1.4.4.1.3 2020 Energy report

In 2020, gross consumption stood at 449TWh, *i.e.* 5% down compared with the previous year. This decrease is due both to the health crisis and to milder temperatures overall.

The French balance of trade amounted to 43.2TWh in 2020, down by 12.5 compared to 2019 [(1)]. Commercial export volumes were significantly lower, at 77.8TWh, whereas import volumes are increasing, reaching 34.6TWh. Nevertheless, France exports across all its borders, and is the country with the highest export level in Europe.

The quality of electricity supplied by RTE is estimated on the basis of two indicators: the equivalent outage time and outage frequency. The values of these indicators for 2020 are still provisional. Based on information available to date, the equivalent outage time is 3 min 4 sec (the target set by the CRE is 2 min 48 sec) and 0.341 for outage frequency (the target set by the CRE is 0.46).

1.4.4.2 Distribution – Enedis

37.2 million	1.38 million	€3,962 million	38,624	421
CUSTOMERS	KM NETWORK	INVESTMENTS IN 2020	EMPLOYEES	CONCESSION AGREEMENTS

As a distribution network operator, Enedis' main mission is to operate and develop the public electricity distribution network, guaranteeing its security and safety, and overseeing the balance of electricity flows at all times. Founded in 2008, ERDF became Enedis in 2016 and now serves around 95% of the population in mainland France. The other 5% are served by Local Distribution Companies (LDCs). In 2020, Enedis distributed electricity to more than 37.2 million customers (points of delivery) and provided for the injection from more than 458,900 production sites in mainland France, thanks to a network of around 1.38 million kilometres. In addition to this total, 16,700 producers have declared non-grid-feeding self-consumption installations, bringing the total number of production installations up to 475,600.

The distribution network for which Enedis is the concession holder (see section 1.4.4.2.2 "Distribution activities") is, at 31 December 2020, made up of around:

- 653,390 kilometres of A-type high-voltage (HVA) lines of 20,000 volts;
- 728,391 kilometres of low-voltage (LV) lines of 400 volts;
- 2,224 HVB/HVA source substations;
- 796,148 HVA/LV transformer stations.

Simplified report of energy flows

(in TWh)

(1) RTE injections volumes are presented net of backfeeding from distribution to transmission grid.
NB: The values correspond to the expression to the first decimal of the precise values.

(1) Source: RTE - Electricity report.

Electrical losses are inherent to the functioning of the distribution network and mainly result from physical effects which are directly dependent on the amount of electricity delivered. Enedis must compensate these losses to complete the amount of energy delivered to all the customers connected to the distribution network.

The volume of losses in 2020 stood at 23.3TWh (see Electricity report above), *i.e.* a rate of 6.01% [(1)].

Energy purchases made to compensate losses recognised in the accounts, including restatements of prior fiscal years, amount to €1,116 million. To compensate these losses, Enedis buys the corresponding electricity from the wholesale market, either through organised market platforms, or through calls for tender open to around 20 qualified suppliers. Enedis also takes part in the consultations organised by the Purchase Obligation mission, within DOAAT.

Enedis' entitlement to ARENH rights to cover losses takes place, as applicable, through specific calls for tender with a panel of qualified suppliers for this product.

In 2020, the Covid-19 epidemic resulted in a drop in delivery estimated at 8.4TWh with an impact on losses of -0.7TWh.

1.4.4.2.1 Organisation of Enedis

Distribution activities on mainland France are, very largely conducted by Enedis, a French public limited company (*société anonyme*) with an Executive Board and a Supervisory Board responsible for the management of the public electricity distribution network.

Pursuant to EU Directives, in order to abide by the rules of non-discriminatory access to the grids and independence, which are binding on network managers, the latter must be independent from any energy supply and production activity. If the distribution network manager is part of a vertically integrated company, it must be legally distinct in order to guarantee its functional and decision-making independence. In this regard, EDF and Gaz de France, now Engie, made their distribution network managers subsidiaries in 2008. Furthermore, Enedis and GRDF share a "common service" pursuant to the legal framework (see section 1.4.4.2.3 "Service shared by Enedis and GRDF").

The Supervisory Board of Enedis comprises fifteen members, of which:

- eight are appointed by the Ordinary Shareholders' Meeting;
- five are representatives of the employees elected in accordance with the conditions set out in Law no. 83–675 dated 26 July 1983 relating to the democratisation of the public sector;
- one member is appointed by the French State by virtue of Articles 4 or 6 of Ordinance no. 2014-948 dated 20 August 2014;
- and one member, representing the organising authorities for the public electricity distribution network, is appointed by decree in application of Article 153 of Law no. 2015-992 relating to energy transition for green growth.

A new Chairman of the Management Board was appointed on 9 February 2020 to head up a two-person Management Board. On 1st August 2020, the Enedis Executive Board was expanded to five members who performed their work under the supervision of the Supervisory Board. In application of the possibility offered by Ordinance no. 2014-948 dated 20 August 2014 (Article 15) and in compliance with Decree no. 2015-38 dated 19 January 2015, the French State appointed by a Decree dated 21 April 2020 a Government Commissioner for the purposes of attending the meetings of the Supervisory Board of Enedis.

On 1 June 2016, the business name of the public distribution network operator was changed to Enedis, as a replacement for ERDF. This new name reflects the company's strong commitment to the energy transition in the wake of COP21. It will also raise the profile of the network operator and clarify its purpose, as the CRE recommended.

Enedis' missions in France

Enedis, pursuant to the conditions set by law and the concession contracts signed with each of the public electricity distribution contracting authorities, performs its missions as the public distribution network operator in mainland France.

These missions are:

- define and implement operational, investment and development policies in relation to the electricity distribution network;
- provide connection and access for users to these networks under objective, transparent and non-discriminatory conditions, as well as inter-connection with other networks;
- provide users with the information needed to access the network efficiently (information protected by regulations or law excepted);
- oversee relations with the energy regulation authorities (Energy Minister, the Energy Regulation Commission (CRE), public distribution contracting authorities) in line with its activities;
- oversee relations with local authorities in respect of its activities;
- negotiate, conclude and manage concession contracts;
- operate, maintain and repair the electricity distribution networks;
- design and build infrastructure, as well as manage work on the networks;
- carry out metering activities for users connected to the networks, particularly as regards supply, installation, meter inspection, maintenance and renewal of metering devices, as well as managing data activities and any other missions relating to its work as a whole;
- ensuring that the market works properly, and providing equal access to the network and data for market players;
- encourage the integration of renewable energy in the grid and the implementation of energy efficiency initiatives;
- ensure the monitoring of the load sharing perimeters;
- be the guarantor for the distribution and accounting for the energy flows between the network user players, and the fair compensation of losses on these networks.

1.4.4.2.2 Distribution activities

Enedis' business is based on a number of activities:

- manage, in its capacity as the concession holder, the assets under concession;
- run and maintain the network in such a way as to ensure the continuity of supply;
- ensure customer satisfaction, providing the best possible connection times, and using customer feedback and surveys to deliver better service;
- carry out work on the network (in particular, network connection, reinforcement and renewal work);
- provide access to the network to all users in the framework of contractual provisions in force (see section 1.4.4.1.2, textbox on regulation relating to "third party access to the network");
- and manage the meter fleet, as well as obtaining, processing and transmitting data on network user consumption.

Change in investments

In 2020, €3,962 million was invested by Enedis. €1,584 million was earmarked for connections (consumers and producers) and adjusting the grid to the load. €1,998 million was dedicated to the quality of the service, to securing the networks, to the security and preservation of the environment and rolling out the Linky meters, areas where the identified expectations of customers, local authorities and concession authorities are particularly strong. Lastly, €379 million was invested in information systems and operational resources (vehicles, machinery, real estate, etc.).

In addition, the contracting authorities invested €730 million in 2020. In all, almost €4,692 billion was therefore invested on the distribution networks in 2020 in mainland France.

(1) This rate is now calculated as a ratio of losses for the year to gross inflows before deducting backflows to the transmission network.

Gross investments made by Enedis

(in €m)	2020	2019
Connections and reinforcement	1,584	1,623
Regulatory, safety and transmission channel obligations	409	445
Work instruments and operational resources	379	365
Network modernisation [1]	1,589	1,821
TOTAL INVESTMENTS OF ENEDIS	**3,962**	**4,254**
WORK ALLOWANCES BY THIRD PARTIES AND LOCAL AUTHORITIES [2]	**730**	**725**
TOTAL NETWORK INVESTMENTS	**4,692**	**4,979**

(1) Of which Linky: €682 million in 2020, €722 million in 2019, €792 million in 2018 and €612 million in 2017 (generalisation costs and those related to post experimentation).

(2) After deducting PCT (a) and ARTICLE 8 (b) for the share funded by Enedis.

(a) PCT (portion covered by the tariff): portion paid to project manager contractors from the contributions to the delivery tariff for financing a connection.

(b) Article 8 of Annex 1 of the concession specifications relating to the integration of works into the environment (for example, the work to bury lines).

Furthermore, Enedis continues its efforts in the preventative maintenance of networks, including work relating to tree topping. This came to €314 million in 2020 (compared to €319 million in 2019).

Quality of service

Quality of service is one of Enedis' main objectives. In 2020, the average outage time, excluding transmission incidents and exceptional incidents, was 58 minutes. This result, the best in 15 years, stems from the combination of a relatively favourable year of weather and the benefits of resilience initiatives taken in recent years. The quality of service provided is also reflected by maintaining steady voltage levels, kept as close as possible to the level set by regulations, and by minimising the number of outages.

To respond to large-scale incidents, Enedis relies on an Electricity Rapid Intervention Force (FIRE), which allows it to mobilise, at any time, in an affected region, the teams and resources from other regions in order to restore customers' electricity as rapidly as possible. In 2020, FIRE intervened on six occasions.

As regards insurance cover for the protection of the overhead distribution network against the effects of large scale storms, see section 2.1.2.6 "Insurance" - "Storm cover".

Development of renewable energies

Across the Enedis scope, the number of solar panel generation installations connected to the network grew again: in 2020, a growth in photovoltaic connections was observed with 876MW of new photovoltaic facilities connected (compared with 858MW at the end of 2019). The increase in wind power generation connected to the public distribution network also continued, with 789MW connected in 2020 (compared to 1,202MW in 2019).

At the end of 2020, a total of around 24.2GW in photovoltaic and wind power generation was connected to the Enedis grid, made up of 9.1GW from photovoltaic plants and 15.1GW from wind power generation. To the power thus generated are added other sources of power generation, in particular hydropower plants (1.6GW), cogeneration (2.5GW), biogas, biomass and dispatchable fossil-fuel thermal. In all, at the end of 2020, the generation fleet connected to Enedis was around 30.2GW.

In 2020, more than 30,200 photovoltaic self-consumption facilities were also connected, representing close to 99% of the year's connections for small producers.

In addition, Enedis has continued its efforts to develop capacities for accepting renewable energies, by implementing construction work on sources as part of the regulatory framework in the regional plans for the grid connection of renewable energies.

Electricity market

The French electricity sales market has been open to competition for all customers since 1 July 2007. 82 electricity suppliers, operating on the French market, have a contract with Enedis. This contract sets out the operating procedures between the supplier and distributor when the customer takes out a single tapping contract, encompassing supply and delivery of electricity, with or without the option of a single dispatch contract for individual self-consumers.

The supply market is facing sharply increased levels of competition for subscribed power supply in excess of 36kVA since the elimination of regulated sales tariffs (TRVs) for this type of power at the end of 2016, as well as for subscribed power supply for less than 36kVA in view of the partial end of Professional TRVs announced on 1st January 2021. This most recent major change was successfully supported by Enedis. Furthermore, more than 250 new service providers are exploiting detailed customer consumption data, subject to the customers' permission, also making a significant contribution to the market dynamics.

Regulatory notice

Tariff for using the public electricity distribution networks (distribution TURPE)

Over 90% of Enedis' sales are made up of revenues made from electricity transmission. The tariff for using the public electricity network (TURPE), in terms of levels and structure, is set by the CRE in a transparent and non-discriminatory manner, in order to cover all the costs borne by the efficient network operators.

On 28 June 2018, the CRE adopted TURPE 5 bis HVA/LV (medium voltage – low voltage). This tariff came into effect on 1 August 2018 for a period of approximately three years. It involves an inflation-linked change on 1 August 2019 and 2020 (apart from corrections arising from the income and expense regularisation account).

In the context of TURPE 5 HVA/LV, Enedis' financial compensation is derived from the sum of the compensation on managed assets (RAB paid at 2.5%) and the compensation of regulated shareholders' equity (compensated at 4.0%).

In a decision dated 20 May 2020, the CRE set the increase in the tariff on 1 August 2020 at 2.75%, in accordance with the annual adjustment formulas.

On 21 January 2021, the CRE published its decisions for the distribution TURPE 6 (HVA and LV) tariffs. This price, aimed at covering costs for the fiscal years 2021-2024, will apply from 1 August 2021 onwards for a period of around 4 years. It provides for an increase on 1 August each year corresponding to the provisional inflation rate plus 0.31%. In the context of this tariff, Enedis' financial compensation is mostly derived from the sum of the compensation on managed assets (RAB paid at 2.5%) and the compensation of regulated shareholders' equity (compensated at 2.3%). This decision was forwarded to France's Minister for Ecological Transition and the Minister for the Economy, Finance, and Recovery, and will be published in France's Official Journal.

Concessions

At 31 December 2020, Enedis and EDF were co-concession holders of 421 concessions contracts, covering around 95% of the population in continental metropolitan France. The concession contracts are generally concluded for a period of 25 to 30 years.

On 21 December 2017, the French National Federation of Licensing Authorities (*Fédération Nationale des Collectivités Concédantes et Régies, FNCCR*), France Urbaine, EDF and Enedis signed a framework agreement based on a new concession agreement model. Twenty-five years after the 1992 agreement with FNCCR, this new framework agreement includes France Urbaine which represents municipalities, large urban inter-municipalities and cities of which the majority of the members have contracting authority status for the public distribution of electricity. The new standard agreement endorsed by this agreement restates the principles of the French concession model: public service, regional solidarity and national optimisation, while at the same time taking into account issues involving energy transition. The official introduction of this new model opens the way to a modernised and lasting relationship between Enedis and the concession contracting authorities. Despite the health crisis and municipal elections delaying the closing of certain negotiations, renewal of concession agreements continued at a sustained pace in 2020. At 31 December 2020, 240 concession contracts had thus been entered into on the basis of the new model. Other negotiations have been undertaken or scheduled, with the goal of renewing almost all the contracts signed using existing contract templates by the end of 2021.

Regulatory notice

French legal system applicable to concessions:

In accordance with Articles L. 121-4 *et seq*. and L. 322-1 *et seq*. of the French Energy Code, and Article L. 2224-31 of the French Local Authorities Code, the public distribution of electricity is operated under a system of public service concessions. Pursuant to this body of law, the contracting authorities organise the public electricity distribution service through concession agreements and general specifications that set forth the respective rights and obligations of the contracting authority and the operator. Currently, the contracting authorities are most often public institutions formed by associations of several municipalities cooperating together, some of which may have a departmental coverage.

The separation of production and supply activities on one hand, and network activities on the other imposed by European Directives has led to the identification of a public service with two distinct missions: on the one hand, the regulated tariff supply mission entrusted to EDF and the LDCs in their respective exclusive service areas and, on the other hand, the development and operation of the public electricity distribution networks, entrusted to Enedis and the LDCs in their respective exclusive service areas, and EDF for areas not interconnected to the continental metropolitan network.

Article L. 334-3 of the French Energy Code specifies that concession contracts must be tripartite, signed by the contracting authority, the distribution network manager (or the territorially competent LDC) for aspects relating to the management of the public distribution network, and by EDF (or the territorially competent LDC) for aspects relating to regulated tariff distribution.

Within the limits fixed by the law and by the jurisprudence, the contracting authorities are the owners of the distribution networks which constitute returnable assets [(1)].

Pursuant to Article L. 3213-1 of the French Public Procurement Code, transposing Article 10.1 of the Community Directive no. 2014/23/EU of 26 February 2014 into national law, concession contracts for the operation of the public distribution network and the supply of electricity at regulated tariffs are concluded by mutual agreement, that is to say without publicity and competitive bidding procedures.

The ELAN Housing bill adds chapter 5 about rising mains to the section of the French Energy Code on accessing and connecting to electricity networks. Rising mains put into service after the law is published will belong to the public distribution network. Those put into service before the law is published were integrated into the public distribution network on 24 November 2020. Until such date, owners and joint owners had the opportunity to apply to have their rising mains integrated ahead of time. They could also choose to retain ownership of the mains.

1.4.4.2.3 Service shared by Enedis and GRDF

The common service function shared by Enedis and GRDF is defined by Article L. 111-71 of the French Energy Code. Its missions in the electricity and gas distribution sector are building structures, site project management, network operation and maintenance, and metering operations. This service is not a legal entity in its own right. Enedis and GRDF's relations in this common service are governed by an agreement that defines the scope of the service and the resulting division of costs. The agreement has an unlimited term and can be terminated at any time subject to 18 months' notice: in such a case, the parties undertake to renegotiate the agreement during the notice period. It is updated regularly. In 2019, the governance agreements between Enedis and GRDF were completely reviewed.

1.4.4.2.4 Future challenges

Smart grids and smart meters (Linky)

Enedis, guarantor of the electricity distribution public service, invests at all times to develop, modernise and secure the electrical network. The adaptation of the electricity grid to the new needs of French society is a major strategic challenge. To achieve this, Enedis is continuing the industrial deployment of the Linky system, based on a new generation of meters, called "smart meters" that can receive orders and send data without the physical involvement of a technician. This system represents the first stage of smart grid implementation or "Smart networks".

It involves equipping the distribution network with connected objects, including the Linky meters, in order to integrate renewable energy electricity generation, which has undergone a significant expansion, further ensuring the balance between generation and consumption at all points of the electricity grid, and enabling suppliers and other customers to offer new energy solutions to their customers. The large-scale advent of Linky meters also accelerated the implementation of new contractual offers (differentiated and lower tariffs, for the use of "green" electricity generated by solar panels). With Linky, electricity consumption curves per day, per week or per month are available to customers. This facilitates the management of energy consumption and is a concrete lever that meets the expectations of the public authorities responsible for energy transition.

Enedis launched on 1 December 2015 the widescale deployment of Linky meters, representing total investment of €3,972 million [(2)] over the 2014-2021 period. At the end of 2020, the cumulative investment (2014-2020) already carried out amounted to €3,415 million, for 29.66 million Linky meters installed (including those used in the experiment), of which 29.03 million open to all services. The percentage of Linky meters installed was 78.6%, compared to a target determined by the CRE for the end of 2020 of 80%. Almost four out of five households in France are now equipped with Linky smart meters.

Enedis has structured the French industrial sector for smart electricity grids with other French players in this sector through the "Thinksmartgrids" association which now numbers around one hundred members (major industrial players, startups, universities, research institutes, etc.).

Its purpose is to maintain its leadership in Europe and to expand in the rest of the world. Belgium, Egypt, Indonesia and India have selected solutions proposed by Enedis and its expertise. In India in particular, deployment of smart meters in the region of New Delhi entered its operational phase in 2019.

(1) Returnable assets are those that must imperatively be returned to the granting authority at the end of the concession. Such property is deemed to belong to this local authority from the outset. They are defined by the concession contract or even by the law. By default, generally qualified as such are the assets that are indispensable to the performance of the concession service.

(2) The programme completion costs were reviewed downward, from €4,455 to 3,972 million for the period 2014-2021, after taking into account prices of the latest contracts signed for equipment (meters and concentrators) and for installation services.

Regulatory notice

Linky regulation

The Linky project, led by Enedis, is subject to a specific regulatory framework regarding meters operating life (20 years), with a dedicated regulated asset basis (RAB) for the meters installed between 2015 and 2021 and the associated information systems.

The CRE's decision dated 17 July 2014 thus set a nominal return rate before tax of 7.25% and a 3% additional premium in return for an incentive regulation to better meet costs and system performance, targets as well as deadlines bringing the return on the RAB to 10.25%. The incentive regulation can also trigger penalties potentially lowering the return, although not below a floor of 5.25%. As provided for in the decision dated 17 July 2014, the incentive regulation of the system's performance for 2020 and 2021 was set by the CRE in a decision dated 23 January 2020.

In addition, the implementation of a postponed tariff, set up to guarantee a neutral impact of Linky on the tariff for customers, means that payments for the 2014-2022 period will be made during the 2023-2030 period. This postponed tariff, to which is attached a 4.6% compensation covering the cost of financial carry, will be totally paid by 2030. At 31 December 2020, the deferred amount is +€1,650 million (this represents a receivable from Enedis in relation to their network users, which is not recognised on the Group's balance sheet at 31 December 2020, pursuant to the accounting standards in force on this date).

Ecological transition

In September 2020, Enedis unveiled its industrial and HR goal for 2020-2025: becoming France's preferred public service encouraging ecological transition. Enedis intends to bring together industrial performance and a sustainable approach, at the heart of territories and alongside its customers, responding to present-day changes and anticipating those of the future.

This project takes into account the current changes in the energy mix in Metropolitan France enshrined in the multi-year energy programme (*Programmation pluriannuelle de l'énergie,* PPE); this calls for increased integration of decentralised intermittent renewable electricity production assets in electricity grids. On the other end, new electric practices, thus resulting in new types of energy use, are expected to grow, in particular due to the expected development in electric vehicles. Ecological transition calls for the development of electricity storage capacity and services, allowing optimised management of grid supply and demand balancing. Most of these transformations will be based on the electricity distribution network; this will become the backbone of ecological transition.

In this respect, Enedis is implementing several solutions, in which the Linky meter is one of the basic building blocks, providing access to a thoroughly modernised network for both producers and customers from the mass market and the business market. These solutions cover mainly the monitoring and steering in real time of low- and medium-voltage networks, anticipation of events, the integration of renewable energies and electric vehicles, storage management, voltage stability, etc. The challenge for the distributor is to support energy transition while developing the networks at the lowest cost for society. Thanks to the wide-spread use of rollout of Linky and new technologies, a more detailed and responsive oversight is possible, based on a better understanding of consumption, generation and the state of the network, and on the increasing use of flexibilities. This "intelligence" makes it possible to optimise investments, while guaranteeing the reliability of the network, pursuant to Enedis' double public service objective of performance and security.

The smart solutions being rolled out relate to areas such as connected objects, flexibilities, individual and collective self-consumption, demand-side management, storage, data management, and business models.

Industrialising technical solutions

Enedis is pursuing the industrialisation of cutting-edge solutions for smart grids. New digital technologies are gradually equipping all components of the network:

- source control stations (PCCNs, or Digital Command and Control Stations, which provide central management of the network's transmission automation;
- FARs, or Functions for Automation of the Network, which facilitate management of the insertion of electricity from renewable sources), the distribution stations (HVA/LV Smart stations);
- the sensors on the network;
- all the information system tools (forecast, management, planning management, Linky network, etc.).

Enedis continues with the ambitious modernisation of the network, in order to facilitate the insertion of renewable energies and to assist all players in the electricity system. Technology based on artificial intelligence is being progressively tested and deployed on the grid, in particular to help with predictive maintenance of grid assets (modelling and breakdown prevention, etc.).

Digitisation of energy systems: carry out the digital switch-over and the management of the data

The development of measurement systems combined with digital innovations (the internet of things) enables collection and analysis of network data to be increased with a view to optimising management. Blockchain and artificial intelligence both offer new possibilities for network managers and all the players in the value chain, in particular regarding traceability from production to consumption, scheduling network maintenance operations, and anticipating supply and demand balancing.

Against this backdrop, the digital programme undertaken by Enedis since 2014 has matured. This programme is based on four vectors:

- infrastructure management (remote management, predictive management, etc.);
- dialogue with outside parties;
- management of data from electricity meters and sensors;
- and social and cultural transformation of the company, which is providing its employees with new tools connected to the Information Systems.

The programme aims at delivering better services to customers. Enedis has organised itself to process, exploit and accumulate the collected data and provide it to the various players in the electricity system (suppliers, transmission network operators, local authorities, new entrants) in compliance with the confidentiality and security regulations.

Enedis' action for the "smart cities", all local communities and citizens.

Self-consumption, self-supply, electric mobility, smart meters, data management and the optimisation in real time of networks – these are the new challenges facing electricity distributors in relation to regions as a whole, and especially cities.

Enedis is pursuing its transformation from DNMs (distribution network managers) to DSOs (distribution systems operators) and acts as a facilitator of energy and ecological transition, both in general and in particular for all applications at every scale, including locally (cities, neighbourhoods, etc.). This role covers not only the networks but also the associated data, necessary for regional players and cities aiming to become smart cities.

The role of Enedis is therefore constantly changing as it adjusts to regional reorganisations and the organisation of society into metropolises, whilst also ensuring a high-quality electricity supply is maintained in rural areas. Enedis makes its technical expertise available to local authorities to contribute to local energy policies, "positive energy territories for green growth", urban travel plans, and "smart cities" projects.

The Open Innovation policy developed by Enedis has also become popular in local communities which have organised many energy, technological and environmental initiatives, and rely on a number of startups. Enedis "enriches" these projects and developments with its own research and innovation, especially in the fields of smart grids and data.

In 2020, Enedis continues the implementation of its strategic development plan focusing on becoming a key industrial partner for all electric mobility players in order to jointly develop solutions to support its development on a large scale. Indeed, the great majority of charging stations will be directly or indirectly connected to the distribution network developed and operated by Enedis.

In response to the collective challenge constituted by electric mobility, Enedis' contribution is expected by all stakeholders, in particular local authorities and industrial companies, for which Enedis is a partner on a day-to-day basis, with the stated aim of making electric mobility possible for everyone, everywhere. In 2020, operational achievements on the ground accelerated: in close cooperation with local authorities, Enedis is now a partner in over 150 projects relating to light vehicles, coaches, buses, and boats.

Acquiring and developing tomorrow's skills.

The digital grid has enabled Enedis to become a data operator, revealing the need for skills in information technology, telecoms, and cyber security. Enedis is also enriching its customer relations via a digital strategy that includes a mobile application, a local authorities space on its website, and a higher profile on social media in 2020.

To develop the skills needed for the future, Enedis is devoting the equivalent of 8% of its payroll costs to training, compared to a statutory obligation of 1.6%. Recruitment policy is geared to a long-term perspective, targeting the company's core business (grid operation, maintenance, and development), as well as new business lines relating to digital transformation, with nearly 800 new recruitments per year planned over the next four years.

Action to mitigate climate change

Enedis aspires to achieve "carbon neutrality" by 2050 by drastically reducing its own greenhouse gas emissions, and beyond that, encouraging its suppliers to adopt an ambitious approach in this respect. Residual emissions will be offset by funding certified, auditable projects, in particular through reforestation.

Enedis also intends to contribute to COP21 targets by accelerating the deployment of low-carbon electricity solutions on a large scale and controlling electricity consumption using smart meters and smart grids.

- **Enedis will become carbon neutral by 2050 by drastically reducing the 1.2Mt CO_2eq of its own emissions (Scopes 1 and 2) and encouraging an ambitious procedure with its suppliers and providers to reduce the 2.4Mt CO_2eq figure for Scope 3 as much as possible.** Residual emissions will be offset by certified negative emissions projects (reforestation, etc.)

To achieve an initial target of a 20% reduction by 2025, Enedis plans the following:

- ongoing electrification of its vehicle fleet, aiming for 100% of its light commercial vehicles to be electric by 2030, and 100% of its construction vehicles to be electric by 2050 at the latest (at the end of 2020, the company's fleet comprised 2,913 electric vehicles out of a total of 18,814 vehicles, some 15.5%);
- progressive replacement of its backup generators with low-CO_2-emission mobile solutions (batteries, fuel cells);
- reduction of its SF_6 emissions through optimised maintenance of source substations and a change of technology to new HV cells;
- reduction of its emissions arising from loss purchases, thanks to a lower electricity emission factor as renewable energy production replaces some high-carbon power generation;
- reduction of the energy consumption of its service sector sites, including those relating to information technology, at the pace specified in the "service sector decree" (*décret tertiaire*), 40% less than in 2010 by 2030;
- optimisation of personal and professional travel through the development of teleworking, reducing the number of interventions on customers' premises thanks to the Linky meter, and reducing the number of face-to-face meetings, these increasingly being replaced by videoconferences;
- making its suppliers and providers commit to moving towards carbon neutrality by leveraging commitment charters, environmental criteria, eco-design of equipment, and the use of recycled materials.

- **Enedis will be a key player in the implementation of France's National Low Carbon Strategy, favouring innovative electricity solutions, replacing fossil energy, and deploying smart management of the electricity system to manage consumption.**

Enedis is also mobilised in several other ways:

- facilitating the integration of new electricity solutions in the distribution network: renewable energy (67GW renewable energy by 2035), electric charging stations (12 million connected to the network by 2035), self-consumption, and storage;
- developing the use of electricity and more efficient processes: heat pumps, etc.;
- controlling consumption using smart electricity grids and smart meters;
- ensuring smart management of the electricity system at controlled cost by developing new forms of flexibility.

- **To validate its low-carbon strategy, Enedis is fully engaged in achieving the Science Based Targets certification (SBTi) being sought by EDF group.**

In addition to its initiatives for climate, Enedis is working to preserve biodiversity through initiatives designed to protect birds from the risk of electrocution and support to other initiatives under the single banner "Act4nature", now "Companies committed to nature – Act4nature France".

1.4.4.3 Island Energy Systems

Island Energy Systems (IES) brings together the electricity systems operated by EDF which are not connected, to the mainland network: Corsica, the overseas departments (except Mayotte) and the overseas territories of Saint-Barthélemy, Saint-Martin and Saint-Pierre-et-Miquelon, as well as several Ponant islands (Sein, Ouessant, Molène, Chausey).

EDF's organisation in these regions is based on two structures:

- the Island Energy Systems Department, ensuring the supply and demand balance on a daily basis, overseeing all networks and providing a sales and marketing activity with regulated sales tariffs, guided by an active energy efficiency policy;
- the subsidiary EDF Production Électrique Insulaire, which is responsible for building and operating new means of generation.

The additional generation costs in these territories compared with equivalent costs on the mainland, which the legislator considers as a public service expense, are offset by the state budget.

Tariffs for Using the Public Transmission and Distribution Networks (TURPE) apply to users connected to the distribution networks.

IES KEY ELEMENTS

	Data at end-2020 Total
Number of customers	1,185,000 approximately
Network length *(in km)*	38,200 approximately
Net installed capacity of the EDF fleet* *(in MW)*	2,005
of which hydropower fleet and other renewable energy sources	*22%*
of which thermal fleet	*78%*
Output* (in GWh)	5,659
of which hydropower output	*22%*
Purchases of energy from third parties *(in GWh)*	4,020
of which renewable energies, including bagasse	*41%*
of which other energies	*59%*
TOTAL ENERGY GENERATED AND PURCHASED FROM THIRD PARTIES	**9,679**

* *Data including EDF IES Division, EDF Production Électrique Insulaire (PEI), a wholly-owned subsidiary of the EDF group.*

In view of the difference within these systems between the power generation costs and the sale price at the equalised tariff, EDF is applying demand-side management (DSM) strategies in these territories together with institutional players such as government departments, municipalities, the Energy Regulation Commission (CRE), the French Agency for Environment and Energy Management (ADEME), local institutions...

Changes and outlook

Investments to decarbonise and reinforce the electricity generation fleet

In accordance with the territorial PPEs, the EDF group has undertaken to replace the main power plants which are at the end of their useful lives.

The electricity generation plants commissioned by EDF PEI between 2012 and 2015 in Réunion, Martinique, Guadeloupe, and Corsica are equipped with innovative technology enabling the best industrial and environmental performance to be delivered and helping to meet some of the emerging electricity needs of these territories.

The new power plants will be constructed and operated by the subsidiary EDF PEI (*Production Électrique Insulaire*). In territories where this is specified in the PPE, EDF PEI envisages operating new power plants using liquid biomass or converting its existing plants to bioliquid.

EDF PEI is currently a partner in a photovoltaic plant with battery storage in French Guiana, and in a in a wind power plant with battery storage in Martinique (commissioned in 2019). EDF PEI is also strengthening its renewable energy capacity thanks to common projects with EDF Renewables.

Concerning SEI, the extension of the Saint-Barthélemy power plant (two new generators of 16MW) and the renewal of the power plant on Saint-Pierre-et-Miquelon (21MW) have respectively been operational since 2014 and 2015. The Saint-Martin power plant was delivered in end June 2016 for an installed capacity of 40MW.

Investments in electricity networks

The continued yet moderate growth in consumption in most of these regions despite the energy efficiency actions undertaken, as well as the development of renewable energies and the growing number of generation facilities coming online, have led the EDF as network operator to continue the development and reinforcement of the electricity networks.

In total, EDF invested over €250 million in Production (including EDF PEI) and Networks activities in 2020.

A commitment to projects devoted to a better integration of renewable energies in the electricity generation mix and to optimising the management of electrical systems

France's Energy Transition Act establishes 2030 as the target date for energy autonomy for French overseas departments, and 2050 as the target date for Corsica.

The EDF group supports the emergence and development of electricity generation methods based on renewable energies adapted to IES. The methods favoured are those that provide abundant and guaranteed energy at competitive generation costs, but also sustainable in the long term, in such a way as to position them as credible alternatives to thermal generation: biomass, marine and river energies, waste recovery, biogas.

EDF also contributes to making advances in technical capacities relating to the insertion of asynchronous renewable energies into IES by suggesting improvements to their technical specifications, making the grid more resistant to power disruptions, and developing smart metering systems. EDF has also installed three 5MW batteries, intended as a means of offsetting supply/demand fluctuations, out of a series of power storage projects selected by the CRE in 2018.

Work is also ongoing to create micro-networks 100% powered by renewable energies in certain isolated zones. In 2017, an innovative system combining photovoltaic, digital monitoring and storage was installed on the island of Sein, allowing for a 100% renewable electrical supply several hours each day, while part of Mafate on the island of Réunion receives solar power and is equipped with a battery and a hydrogen fuel cell. Several other projects are planned, especially for remote communes in the interior of Guiana (Maripasoula, Papaicthon, Saint Georges de l'Oyapock).

Energy efficiency is a crucial energy transition lever in the island systems. EDF contributes to the elaboration and implementation of the demand-side management (DSM) territorial strategy, one of the main tools of which are public grants for equipment (over €600 million validated by the CRE for 2019-2023). EDF actively promotes DSM operations financed by these grants for all types of customers, particularly through the "*Agir Plus*" label.

EDF has committed to deploy 1.2 million digital meters in the overseas departments (excluding Mayotte) and Corsica by end-2023. This represents an investment of €268 million. These digital meters will introduce much more modern customer relations and amplify the energy transition levers. At end-2020, over 496,600 meters were installed.

1.4.4.4 Électricité de Strasbourg (ÉS)

Électricité de Strasbourg (ÉS) is an Alsatian energy producer which is committed to the long-term energy and economic performance of its territory *via* its four activities: the distribution of electricity, supply of energies, energy services and the production of renewable energies. This portfolio of activities makes it possible for the ÉS group to better provide support to its customers in the energy transition.

ÉS also provides services to Local Distribution Companies (Entreprises Locales de Distribution, or LDCs), mainly in eastern France.

The ÉS group is 88.64% owned by EDF, and the remaining shares are owned by the public and its employees. Its shares are traded on Euronext Paris.

1.4.4.4.1 Distribution

Strasbourg Électricité Réseaux is the ÉS subsidiary in charge of distribution. It is an independently managed subsidiary responsible for public electricity distribution network management.

Strasbourg Électricité Réseaux operates, maintains, develops and renews an electricity network of over 15,000 kilometres in the 400 Alsatian municipalities that chose it to operate their electricity distribution grids under concession agreement. These concession agreements were renewed between 1993 and 2001 for a term of 40 years. The territory serviced covers three quarters of the Bas-Rhin department and includes more than 566,000 points of delivery for low and high-voltage (A and B) power, as well as connections with the Enedis network and two other downstream network operators.

1.4.4.4.2 Sales and marketing

ÉS Énergies Strasbourg is the sales and marketing subsidiary of ÉS. At end-2020, ÉS Énergies Strasbourg supplied power to more than 555,000 electricity customers (including renewable), and nearly 113,000 gas customers, to both residential and business customers (services and industrial sectors) or to local authorities.

In addition to supplying electricity and gas, ÉS Énergies Strasbourg offers related services such as electricity, gas and plumbing corrective maintenance and digital services designed to help customers better manage their energy consumption. For its residential customers, ÉS Énergies Strasbourg has continued the implementation of support services in renovation and construction of the home, *via* a portal enabling customers to be in direct contact with a network of local partners. For its part, ÉS Énergies Strasbourg is active in the development of solar power and the promotion of alternative mobility, for instance in electric vehicle recharging infrastructure.

1.4.4.4.3 Energy services

ÉS Services Énergétiques, a subsidiary specialising in energy services, is owned 50-50 by ÉS and Dalkia. In energy transition, ÉS Services Énergétiques is positioned as a provider of sustainable solutions and a creator of energy performance, with attractive offers on world performance markets and for energy performance contracts, as well as managing and securing networks (heat, electricity, and street lighting networks). It also carries out engineering for mass catering providers. ÉS Services Énergétique operates three major heating networks in the Strasbourg Eurométropole and the biomass power plant that provides these networks with green energy, with a net gain of 40,000 tonnes of CO_2 per year: the equivalent of emissions from 17,000 cars.

1.4.4.4.4 Renewable energy generation

Deep geothermal energy

ÉS is one of the leading players in deep geothermal energy in France. It has been operating the first deep geothermal power plant for industrial use at Rittershoffen, whose production is steadily rising, for four years now. It should achieve an average of approximately 182GWh (thermal) of renewable superheated water from a geothermal source located at a depth of over 2,500 metres.

ÉS also operates the Soultz-sous-Forêts power plant, which generated 4GWh (electric) in 2020.

In 2017, ÉS launched the Illkirch Graffenstaden geothermal project, designed to supply power to the future heating network of the Innovation Park and surrounding areas. This project is being carried out by the wholly-owned subsidiary, ÉS Illkirch Géothermie. This project is designed to produce both heat and electricity. The first borehole reached the target depth of 3,400 metres in August 2019.

The results achieved on tests on this first borehole show a significant difference compared to expected performance. Modelling studies were therefore undertaken in 2020; these will last several months. The different technical and financial simulations carried out since then on this basis show that at present, it is uncertain as to whether there is the capacity to recover the amounts already engaged on the Illkirch project. Consequently, the assets in question were depreciated at 31 December 2020.

Seismic events in November, and in particular the event on 4 December 2020 in the Strasbourg conurbation, with a magnitude of 3.5, caused by a third party, resulted in the Bas-Rhin Prefecture ordering an administrative enquiry conducted by DREAL [(1)], and announcing the temporary suspension of geothermal projects underway in the press. Strasbourg Eurométropole decided to set up an Investigation and Evaluation Mission (*Mission d'Information et d'Evaluation* – MIE) into deep geothermal energy.

Biomass

The Strasbourg biomass cogeneration plant uses residue from the wood industry in the Vosges and Black Forest mountains. This 37W thermal power plant produces each year 70GWh of electricity from renewable sources and 112GWh of heat from renewable sources per year, which feed two of the three principal heat networks for the city of Strasbourg.

Hydropower

The Le Framont hydropower plant, inaugurated in September 2019 with capacity of 400kW, allows production of approximately 1.5GWh/year (subject to water availability), equivalent to the annual electricity consumption of 350 homes.

(1) Regional environment, land use and housing authorities (DREAL).

1.4.5 International activities

EDF group supplies electricity and gas to some 38 million customers worldwide: domestic customers, businesses, and local government. It is a major energy provider on key European markets: France, the UK, Italy, and Belgium. The Group is seeking to move into new geographical areas, developing low-carbon solutions in growing countries and strengthening its positions in Europe.

32.7 million
ELECTRICITY CUSTOMERS

26 countries
WHERE THE GROUP OPERATES

30 million
PEOPLE BENEFITING FROM CITELUM LIGHTING WORLDWIDE

1.4.5.1 United Kingdom

EDF group activity in the United Kingdom (UK) is led by EDF Energy and EDF Trading (see 1.4.6.3 "Optimisation and Trading: EDF Trading").

EDF in the UK is principally active in:

- the generation of electricity in the UK and delivering decommissioning responsibilities;
- the supply of electricity and gas and energy solutions to domestic and business customers;
- building a new nuclear power station at Hinkley Point, a joint venture (JV) with CGN;
- developing further new nuclear power stations;
- renewables, through EDF Renewables UK, which is a subsidiary of EDF Energy and a joint venture (JV) between EDF Energy and EDF Renewables;
- technical services, energy and low-carbon solutions at customer sites through Imtech, in JV with Dalkia;
- and electric mobility in particular through the acquisition of Pod Point.

In addition, EDF Trading is providing optimisation and risk management services to the EDF group as well as third parties.

EDF Energy is one of the UK's largest energy companies and the largest producer of low-carbon electricity, producing around 17% of the nation's electricity from its nuclear power stations, coal and gas power stations and combined heat power plants.

EDF Energy supplies gas and electricity to 5.22 million business and residential customer accounts as at December 2020.

The company employs around 11,717 people at sites throughout the UK as at December 2020.

EDF Renewables UK operates and develops new renewable generation and storage projects in the UK and Ireland, with almost 1GW of capacity in operation and almost 4GW in planning and development, also including development of large-scale batteries and high-volume power connections to enable rapid electric vehicle charging through Pivot Power [(1)].

Imtech is one of the leading technical and engineering service providers in the UK and active from engineering services and contracting (Imtech Engineering Services and SUIR) to technical facilities management (Imtech Environ), systems integration and digital solutions (Capula) and energy services and energy performance contracting, especially in the public sector (Breathe) (also see section 1.4.6.1.1 "Dalkia").

In electric mobility, EDF acquired during 2020 a majority stake in Pod Point, one of the largest electric vehicle (EV) charging companies in the UK, in a new JV with Legal & General Capital [(2)]. EDF in the UK aims to maintain and build its leading position on UK charging point operations; develop smart charging; and offer time-of-use, low-carbon EV tariffs as well as wider services to support UK drivers in going electric.

In 2020, EDF in the UK released a plan for green recovery and a sustainability roadmap, describing its actions to help Britain achieve Net Zero [(3)].

1.4.5.1.1 EDF Energy strategy

The purpose of EDF Energy, the country's largest low-carbon electricity generator, is to help Britain achieve Net Zero. It does this by leading the transition to a decarbonised energy system in its seven business areas (see section 1.4.5.1).

EDF Energy' and the JVs aim to be the leaders in each area, while capturing advantages from being the only companies working across all seven areas, and from being part of EDF group. This strategy is entirely consistent with CAP 2030 and underpinned by a focus on health and safety, cost efficiency, sustainability and R&D activity across the business.

The Covid-19 pandemic has strongly impacted the UK operating environment. Throughout the crisis, EDF Energy has prioritised the continuation of energy supply and service to its customers and the health, safety and wellbeing of its staff, contractors, customers and communities. At the same time, the company has delivered on its core role in helping to meet the society's essential energy needs, and supports the UK Government's economic recovery plans, including a plan to enable £50 billion of investment in Britain's low-carbon generation.

In its Customers Business, EDF Energy serves over 3.5 million British homes and businesses as well as public services, such as various elements of the wider public sector, including National Health trusts, emergency services, higher education and schools, Local Authorities and the devolved administrations of Wales and Scotland.

EDF Energy focusses on developing a reputation for outstanding customer experience and as a leader on decarbonization. It has maintained an "Excellent" rating on Trustpilot and backs its residential and small business electricity tariffs with zero-carbon electricity [(4)].

The business is developing solutions to help British households, businesses and the public sectors to achieve Net Zero, in areas including electric mobility, low-carbon heating, flexibility services and smart meters combined with data services. EDF Energy is working toward delivering on its regulatory obligations as a leader on energy efficiency installations through the energy company obligation (ECO) scheme and through a cost-efficient roll-out of smart meters to homes and small businesses, as part of the national programme. In 2020, EDF Energy has installed a further c.343k smart meters.

The pandemic, combined with the default tariff cap on the residential GB market and a fiercely competitive environment, mean that cost efficiency and an effective, resilient operating model remain key priorities.

(1) See https://www.pivot-power.co.uk/who-we-are/

(2) See EDF press release of 13 February 2020 "The EDF group acquires Pod Point, one of the UK's largest electric vehicle charging companies".

(3) https://www.edfenergy.com/about/green-recovery; https://www.edfenergy.com/about/sustainability.

(4) The UK government (BEIS) recognises that electricity from wind, solar and nuclear fuel produces zero carbon dioxide emissions at the point of generation. Trustpilot rating as of November 2020.

In electricity generation, EDF Energy seeks to secure value from its existing nuclear, coal and gas assets through continued operational excellence and safe, reliable generation. This includes optimising the operations of the West Burton B combined-cycle gas power station and the remaining lifetime value of West Burton A coal power station, which has UK capacity agreements until September 2021, beyond which EDF Energy continues to examine its options, whilst supporting UK Government policy aimed at ceasing coal-fired generation by 2024.

EDF Energy is decommissioning the Cottam coal power station that closed in 2019, with a people plan to preserve and develop its capabilities as the business evolves from generation to decommissioning.

The same transformation challenge is faced by EDF Energy's fleet of nuclear advanced gas-cooled reactors (AGRs). Since 2009, EDF Energy has extended the lifetime of its AGR fleet by an average of 8 years. Yet due to non-replaceable major components, there is a technical limit to AGR lifetimes. During 2020, EDF Energy announced the end of power generation at Hunterston and Hinkley Point B AGR stations, from no later than 7 January 2022 and 15 July 2022, respectively. Once the stations stop generating power, the company intends to take on defueling them.

As the AGR fleet approaches its lifetime limit, EDF Energy aims to optimise the end-of-life value and to transform to support new defueling activity (funded by the Nuclear Liabilities Fund – NLF), building on its expertise in operating the UK's nuclear power stations, whilst continuing to focus on safe and reliable operations of Sizewell B pressurized water reactor and leveraging capabilities and skills to support new nuclear.

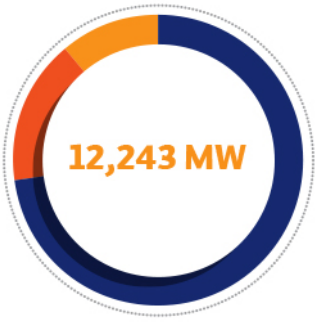
In partnership with China General Nuclear Corporation (CGN), EDF is building two new nuclear units (3.2GW capacity in total) at Hinkley Point in Somerset, based on the EPR technology. EDF Energy is also working with CGN to progress a similar 3.2GW EPR project at Sizewell in Suffolk, the UK Government having announced in December 2020 that it will enter talks with EDF on the funding of the project (see 1.4.5.1.2.4 "Nuclear New Build business). A further new nuclear power station proposal is being developed at Bradwell-on-Sea in Essex based on CGN's "UK HPR1000" Chinese technology.

As a part of its plans, EDF Energy is also exploring models using nuclear to produce hydrogen and heat.

1.4.5.1.2 Activities of EDF Energy

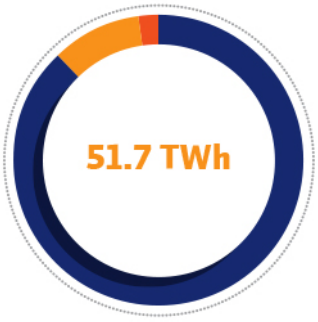
Installed capacity and output of EDF Energy in the United Kingdom - 2020

Installed capacity
In MW



8,923 MW	73%	Nuclear (1)
1,987 MW	16%	Coal (2)
1,333 MW	11%	Gas (3)

Electricity output
In TWh



45.7 TWh	88%	Nuclear (1)
4.9 TWh	10%	Gas (3)
1.2 TWh	2%	Coal (2)

(1) The figures shown represent 100% of nuclear capacity and generation output, shared 80%/20% by EDF and Centrica.
(2) Coal capacity represents transmission entry capacity.
(3) Including 1.35 MW of Barkantine CHP.
NB: The values take into account rounding.

EDF Energy	31/12/2020	31/12/2019
Electricity supplied (1) *(in GWh)*	40,850	44,526
Gas supplied *(in GWh)*	29,462	28,527
Number of residential customer accounts *(in thousands)* (2)	4,837	5,043
Number of employees (3)	11,717	11,834
Total Recordable Incident Rate (4)	0.59	1.03

(1) Power supplied to final consumer including previous year metering cut-offs.
(2) Year end figure.
(3) Headcount at the end of the period, including staff on maternity leave.
(4) Total Recordable Incident Rate: Annual total combined number of Lost Time Incidents, fatalities, Restricted Work Injuries and Medical Treatment Injuries (excluding First Aid)/number of hours worked × 1,000,000. This covers all employees, agency and contractor staff. Excludes EDF Renewables UK and Hinkley Point C project. Accident Frequency Rate (AFR) for HPC is 0.081 at end December 2020.

1.4.5.1.2.1 Regulatory Regime applicable to nuclear facilities in the UK

The following regime is applicable to both EDF Energy's generation and new build assets in the UK.

Regulatory notice

Basic nuclear facilities in the United Kingdom

In the United Kingdom, EDF Energy is required, under the Nuclear Installations Act 1965 ("NIA 1965"), to hold a nuclear site licence for each of its existing nuclear power plants and nuclear power plants under development and comply with a certain number of licence conditions. The Planning Act 2008 ("PA 2008") introduced the concept of Development Consent Orders ("DCOs"), which are the authorisations required to build a new nuclear power plant in the UK. The DCO application process involves conducting an environmental impact assessment, implementing environmental mitigation measures and holding a certain number of public consultations.

Office for Nuclear Regulation (ONR)

In the United Kingdom, the Office for Nuclear Regulation (ONR) and the Environment Agency ("EA")/Scottish Environment Protection Agency ("SEPA") are responsible for the safety, security, emergency planning and environmental regulation that applies to the UK's nuclear sites.

The ONR is responsible for the regulation and inspection of nuclear facilities and the following laws are overseen by the ONR:

- The Health and Safety at Work Act 1974 ("HSWA 1974"), which defines EDF's liability for the safety of workers and others on its sites;
- The Nuclear Installations Act 1965 ("NIA 1965"), under which operators of nuclear power plants need to obtain a nuclear site licence to comply with that licence and to maintain nuclear liability insurance;
- The Energy Act 2013 (Part 3) ("EA 2013") conferred statutory body status on the ONR. It also confirmed ONR's purposes as nuclear safety, nuclear site health and safety, nuclear security, nuclear safeguards and transport. Schedule 8 of the Act includes the powers of ONR Inspectors;
- The ionising radiation regulations 2017 ("IRR") 2017 , which are based on the Basic Safety Standards Directive and provide for the protection of workers and the public against ionising radiation;
- The environmental permitting (England and Wales) regulations 2016 and The environmental authorisations (Scotland) regulations 2018. The 2016 regulations provide the current permitting framework for radioactive substances. The 2018 regulations provide a framework for the authorization of environmental activities and currently include only Radioactive Substances activities. The EA and SEPA are the responsible Regulators for these 2016 and 2018 regulations respectively.

When assessing the measures that may be required to reduce the risks from activities within the scope of HSWA 1974, the ONR requires risks to be reduced as low as reasonably practicable.

Safety is ensured through all of the ONR's duties and its approach to the regulation of nuclear facilities. It begins with a detailed review and assessment of the safety of the design and continues throughout the operation and decommissioning of the facilities.

The ONR uses the powers granted to it under the NIA 1965, the EA 2013 and the 36 standard Nuclear Site Licence Conditions as the basis for its monitoring and enforcement regime. The ONR has extensive inspection powers allowing it to inspect nuclear facilities, request documents and conduct investigations.

Under the NIA 1965, the ONR is authorised to grant licences to applicants and to impose licence conditions which may be varied or revoked. In particular, the ONR can prohibit certain nuclear operations or revoke the licence of a nuclear site. More commonly, the ONR may agree to specific actions, approve arrangements or require changes/variations to operations. The maximum penalty for non-compliance with safety legislation is an unlimited fine or imprisonment for a term not exceeding two years for Directors or both.

1.4.5.1.2.2 Nuclear generation

EDF Energy owns and operates eight nuclear power stations in the UK (15 reactors) with a total capacity of 8.9GW. Since 2009, Centrica plc. ("Centrica") has held a 20% shareholding in Lake Acquisitions Limited, the company in which the nuclear generation assets sit (except Nuclear New Build).

Nuclear generation fleet technology

Seven of the eight nuclear power stations are AGR power stations (Dungeness B, Hartlepool, Heysham 1, Heysham 2, Hinkley Point B, Hunterston B and Torness) and the eighth, Sizewell B, is a Pressurised Water Reactor (PWR) power station.

Safety and radiological protection

Nuclear safety is EDF Energy's overriding priority. In 2020, as in 2019, no safety events were recorded higher than Level 1 – anomaly – on the International Nuclear Event Scale (INES scale). There was one INES Level 1 event.

EDF Energy operates to strict procedures to minimise and control the radiation doses received by employees and contractors at all of EDF Energy's existing nuclear power stations. In 2020, the average individual dose received by all workers on EDF Energy's existing nuclear sites was approximately 0.021mSv. The highest individual dose received in 2020 was 2.6mSv, with the legal dose limit being 20mSv per year.

Lifetime of power stations

The actual lifetime of each power station will be determined primarily by the technical and economic practicability of supporting its safety case. This is assessed at each statutory outage for the following operating period through inspection, maintenance, testing and assessment of plant performance. Following the outage, consent is required from the Office for Nuclear Regulation (ONR) before restarting the reactor. The operating period between statutory outages is normally three years for the AGR power stations and eighteen months for Sizewell B.

In addition, every ten years, the stations are subject to a more detailed and wide ranging Periodic Safety Review (PSR) of design, operational and organisational safety which must also be accepted by the ONR in order to secure continued operation. The next PSR due for submission to ONR is in January 2024 for Sizewell B, with their decision expected in January 2025.

The AGRs were designed with a nominal 25 year lifetime, and Sizewell B with a 40 year lifetime. However, with the aggregation of technical information, and operational and safety experience of EDF Energy, it has been possible to extend the expected AGR lifetimes.

Since British Energy was acquired by EDF, the AGR lifetimes have been further extended by an average of eight years. The last extensions were declared in February 2016. Hartlepool and Heysham 1 were extended by a further five years, and Heysham 2 and Torness were extended by seven years.

Although the work has not yet been carried out to support the extension of Sizewell B, EDF Energy expects that it should be possible to extend it by c.20 years.

See also section 2.2.5 "Risks specific to nuclear activities" – Risk 5A "Nuclear plants in the United Kingdom".

CAPACITY AND OUTPUT BY POWER PLANT

Power Plant	Power [1] *(in MW)*	Output [2] *(in TWh)*	
AGR Power Plants		**2020**	**2019**
Dungeness B	1,090	(0.2)	(0.2)
Hartlepool	1,185	8.5	7.6
Heysham 1	1,060	6.1	6.8
Heysham 2	1,240	8.9	10.3
Hinkley Point B	965	1.8	6.9
Hunterston B	985	2.3	1.0
Torness	1,200	9.9	10.1
PWR Power Plant			
Sizewell B	1,198	8.4	8.5
TOTAL	**8,923**	**45.7**	**51.0**
LOAD FACTOR [3]		**58%**	**65%**

(1) Capacities are stated net of all power consumed for the power stations' own use, including power imported from the grid.
(2) Output in each year reflects any refuelling, planned and unplanned outages.
(3) Load factors are obtained by dividing the actual output by the output that would have been achieved by each power plant operated at its stated capacity appropriate for the period.

Operational review of the existing nuclear generation fleet

The nuclear generation fleet produced 45.7TWh during 2020, 5.3TWh less than 2019 (51.0TWh). The reduction in output is largely due to:

- the extended outages at Hinkley Point B for graphite inspections and safety case work,
- a 50% reduction in output from Sizewell B, between May and September, at the request of National Grid, due to significantly lower than normal summer demand.

These reductions are partly offset by fewer statutory outages in 2020.

Planned statutory outages were carried out on Heysham 2 Reactor 8 and Heysham 1 Reactor 1. Planned statutory outages on Torness Reactor 1 and Hunterston B Reactor 4 were deferred to 2021 due to the Covid-19 pandemic.

A statutory outage was started on Dungeness B Reactor 22 in Q3 2018 with an associated outage on Reactor 21 for work on common systems. These outages were extended to address corrosion on cooling water pipework and the discovery of steam pipework cracking and the units were expected to return to service in May/April 2020. Since then further safety case challenges have arisen in relation to flooding in the event of a boiler tube failure and in relation to a reactor pressure vessel component called the gas baffle. In recognition of the complexity which these cases present, the expected return to service has been put back to H1 2021.

Following extended outages for graphite core inspections and related safety case work, both units at Hunterston B returned to service during H2 2020. The intention is to run each reactor for two six months periods of operation, subject to a graphite inspection and further regulatory approval between each run. The decision has also been taken in 2020 to end power generation at Hunterston B no later than 7 January 2022.

Both reactors at Hinkley Point B are currently shut down while safety case work related to the graphite core continues. The expected return to service dates are H1 2021. The decision has been taken in 2020 to end power generation at Hinkley Point B no later than 15 July 2022.

CURRENT OPERATING LIVES* AND CLOSURE DATES

Power Plant	Type of reactor	Start of Generation	Power Station Lifetime (Formally Declared)	Life Extensions (Already Formally Declared)	Associated Scheduled Closure Date	Scheduled Periodic Safety Reviews
Hinkley Point B	AGR	Feb. 1976	46 years	21 years	2022	2017
Hunterston B	AGR	Feb. 1976	46 years	21 years	2022	2017
Dungeness B	AGR	Apr. 1983	45 years	20 years	2028	2018
Heysham 1	AGR	Jul. 1983	41 years	15 years	2024	2019
Hartlepool	AGR	Aug. 1983	41 years	15 years	2024	2019
Torness	AGR	May 1988	42 years	17 years	2030	2020
Heysham 2	AGR	Jul. 1988	42 years	17 years	2030	2020
Sizewell B	PWR	Feb. 1995	40 years	-	2035	2025

* *As formally recorded by EDF Energy and approved by the NDA.*

Radioactive Waste Management

In the UK, radioactive waste is classified into four categories:

- Low Level Waste (LLW), for which a near surface disposal route exists – including the LLW Repository at Drigg West Cumbria;
- Intermediate Level Waste (ILW), for which no disposal route is currently available in the UK;
- High Level Waste (HLW) is defined as radioactive waste in which the temperature may rise significantly as a result of the radioactivity, so this factor has to be taken into account in the design of storage and disposal facilities;
- Higher Activity Waste (HAW) – this is effectively HLW, ILW and any LLW that are unsuitable for near-surface disposal.

EDF Energy nuclear generation's strategy for LLW and HAW reflects that the UK and Scottish Governments are focused on application of the waste hierarchy (reduce, reuse, recycle, recover). The use of a range of waste recycling and disposal routes will help to make the best use of the UK's Low Level Waste Repository (LLWR) in Cumbria. Only a disposal route for LLW currently exists in the UK.

HAW is stored for the medium-term in safe, purpose built facilities at EDF Energy's stations while longer term national solutions are being established within England and Scotland.

Spent fuel from the AGRs is transported to Sellafield nuclear reprocessing site (owned by Sellafield Limited, a subsidiary NDA) for long term storage.

PWR spent fuel from Sizewell B is stored on site in a purpose built spent fuel dry storage facility which will safely store all of the spent fuel that will be generated over Sizewell B's life. Following long-term surface storage, the Sizewell B PWR spent fuel will be disposed to a future UK geological disposal facility.

The AGR spent fuel arrangements were agreed at the time of the restructuring of British Energy and through them EDF Energy pays for long term storage (and in previous years reprocessing) of spent nuclear fuel. Sizewell B's fuel storage strategy is approved by the NDA as it is funded by the Nuclear Liabilities Fund. EDF Energy has policies to continually improve and minimise the spent fuel and waste arising through the company's wider safety, sustainability and environmental policies.

Regulatory notice

Radioactive waste

In the United Kingdom, EDF is required, under nuclear site licence Condition 34, to ensure, so far as is reasonably practicable, that radioactive material and radioactive waste on its sites is adequately controlled or contained so that it cannot leak or escape.

The Environment Agency regulates the disposal of radioactive waste from licensed nuclear sites under the environmental permitting (England and Wales) regulations 2016. These regulations also regulate what was previously governed by Pollution Prevention and Control, Water Resources Act discharge consents, Flood Risk activity consents and Waste Management licensing.

The Committee on Radioactive Waste Management (CoRWM) published its recommendations for the long-term management of higher activity waste in 2006. In response, the UK Government decided to prefer the use of deep geological disposal facilities for the storage of higher activity waste in England. It set the framework for the management of long-term storage through geological storage, combined with a safe and secure interim storage.

Financing of decommissioning and radioactive waste management

Regulatory notice

Decommisionning of nuclear facilities

In the United Kingdom, EDF is subject to nuclear site licence Condition 35 which forms the basis for the detailed decommissioning plans and programmes required by the ONR, but its requirements must be taken into account with other legal provisions such as the nuclear reactors (Environmental Impact Assessment for Decommissioning) regulations 1999 which require an assessment of the environmental impact of decommissioning and mitigation measures to reduce the environmental impact.

Decommissioning is usually carried out in stages, with ONR formal approval required to move on to the next stage. The ONR may order operators to start or cease decommissioning at any time and must approve decommissioning plans for each stage of the decommissioning process.

EDF Energy is party to a suite of agreements (the Restructuring Agreements) that set out how qualifying decommissioning and uncontracted liabilities costs will be funded by the NLF as well as include a guarantee by the UK Government for the costs of decommissioning the existing nuclear plants. The NLF was funded initially through a UK Government contribution and since privatization by EDF Energy Nuclear Generation Ltd. making quarterly payments to the NLF under the terms of a contribution agreement. In 2020, the UK Government made an additional contribution to the NLF of £5 .billion.

EDF Energy has been in discussions with the UK Government to agree changes and clarifications to the Restructuring Agreements to provide for efficient recovery of qualifying costs and clarity that once the AGR stations have finished defueling that they will transfer to the Nuclear Decommissioning Authority (NDA) for subsequent decommissioning activities. Also see note 15.2.1 "Regulatory and contractual framework" of consolidated accounts.

Prospective operators of nuclear power plants are required to submit in their FDP a Decommissioning and Waste Management Plan ("DWMP"), setting out the operator's costed plans for meeting its decommissioning and waste management and disposal obligations, and a Funding Arrangements Plan ("FAP"), explaining how the operator will make financial provision for its obligations. Chapter 1 of Part 3 of the Energy Act 2008 ("EA 2008") sets out the rules governing the decommissioning and clean-up of nuclear sites, along with detailed provisions on FDPs. Also see note 15.2.3 "Provisions for nuclear plant decommissionning" of consolidated accounts.

1.4.5.1.2.3 Thermal generation and gas storage

Power Plant	Location	Year commissioned	Number of units	Type of station	Capacity *(in MW)*	Output *(in TWh)* 2020	2019
Cottam	Nottinghamshire	1970	-	Coal-fired		0.0	1.7
West Burton A	Nottinghamshire	1969	4	Coal-fired and OCGT (1)	1,987	1.2	0.8
West Burton B	Nottinghamshire	2013	3	Combined Cycle Gas Turbine	1,332	4.9	6.2
TOTAL (2)	**UK**		**7**		**3,319**	**6.0**	**8.6**

(1) Open Cycle Gas Turbine.
(2) Differences in total number due to the rounding.

In 2020, West Burton A generated 1.2TWh of electricity. Coal generation is 1.2TWh less than last year mainly due to the closure of Cottam in September 2019.

The Cottam Power Plant closed on 30th September 2019 after more than 50 years of being in service. The decision to close the station was made following market changes together with a drive to actively remove carbon from the power generation process. Currently plans are progressing to dispose of the site to a third party developer. The likely timescale for agreement is Q1-Q2 2021 although this is subject to agreement of terms between the parties.

West Burton B CCGT generated 4.9TWh of electricity in 2020, a decrease of 1.3TWh from 2019. This represented a good performance considering the market volatilities, plant challenges and associated outage periods during the year.

EDF Energy also operates two mid cycle gas storage facilities in Cheshire. Hill Top Farm became commercially operational in mid-January 2015 with three cavities. A fourth cavity became commercially operational in 2018 with the remaining cavity brought into service in December 2019. During 2020 the decision was made to decommission the Hole House Facility due to challenging market conditions coupled with imminent requirements for some significant investment to the plant. Decommissioning work is planned to start in early 2021.

Carbon Pricing

As the largest generator of low-carbon electricity in the country, EDF Energy benefits significantly from the increase in the wholesale power price as a result of the application of a carbon price to the carbon emissions of fossil fuelled generation. Electricity generators in Great Britain are subject to two main carbon pricing mechanisms, the UK Emissions Trading System (UK ETS) and the UK's Carbon Price Support tax.

In the December 2020 Energy White Paper, the UK Government confirmed that the UK's participation in the EU ETS would be replaced from 1 January 2021 by the operation of the UK Emissions Trading Scheme (UK ETS), which will operate with broadly similar rules to the EU ETS. In their post-Brexit Trade and Cooperation Agreement, the UK and EU have agreed to cooperate on carbon pricing and to give serious consideration to linking the UK ETS to the EU ETS. However, there is no commitment to do so. If there is such a linkage, then the UK ETS is expected to deliver the same carbon price as the EU ETS; without such a linkage, the price delivered by the UK ETS is likely to be more uncertain and volatile.

The Carbon Price Support tax applied to electricity generators in Great Britain is currently set at £18/tonne until March 2022 and the tax rate for 2022/23 is expected to be set in the March 2021 Budget.

1.4.5.1.2.4 Customer business

	31/12/2020	31/12/2019
Customer electricity supplied *(in GWh)*	40,850	44,526
Customer gas supplied *(in GWh)*	29,462	28,527
Number of domestic customer accounts at the end of the period *(in thousands)*	4,837	5,043

The Customers business is responsible for the supply of gas and electricity to residential and business customers across Great Britain and the wholesale market optimisation of EDF Energy's generation and customer assets.

EDF Energy sells energy to two major customer segments: domestic and business customers. The size of business customers ranges from large public sector contracts to small privately-owned businesses. EDF Energy adopts different risk management strategies for domestic and business customers.

In 2020, EDF Energy has taken large steps towards helping Britain achieve Net Zero, with opportunities across nearly all ten points laid out by the UK Government for a green recovery. The company acquired a majority stake in Pod Point, a leading UK charge point provider, giving a key foothold in this market. 7,176 electric vehicles (EV) related products were sold by EDF Energy in 2020.

EDF Energy is one of the UK leaders in energy efficiency installations, through the Energy Company Obligation Scheme (ECO). Elsewhere, in the Beyond Supply market, EDF Energy's Heat proposition has been brought to market which offers innovative low-carbon products which coincides with the UK Government's Green Home Grant initiative. "I&C Flexibility Services has secured an additional 50MW battery contract with the Gresham House portfolio. The team has also signed a 12-year contract with SWGT (Still Waters Green Technology) for a 30MW battery.

EDF remains committed to its Smart Meter installation programme, part of upgrading the UK's energy infrastructure to enable concepts such as smart grids and time-of-use tariffs, which contribute to grid resilience as the UK moves towards a low carbon future.

Domestic

EDF Energy supplied 11.333TWh of electricity and 28.882TWh of gas for the domestic segment in 2020. As at 31 December 2020, EDF Energy had 2.901 million electricity accounts and 1.936 million gas accounts. The 2020 churn rate (at 20.1%) showed an increase compared to 2019 (at 19%), driven by strong price competition and churn of former iSupply Energy customers following their acquisition by EDF in March 2020.

The Coronavirus pandemic had a substantial impact on the business in 2020. This contributed to a total usage increase of approximately 1.1TWh for Domestic Customers YoY, with a higher proportion of time spent at home. However, given the economic downturn, this increased revenue was more than offset by a higher Bad debt charge of £39 million YoY with an increase in the number of customers unable to pay debt owed to EDF.

Competition

The latest data available at the end of October 2020 show that the combined market share of small and medium suppliers is now around 19%, compared to 26% at the end of October 2019. The market share amongst small and medium suppliers is expected to show a significant decrease in 2021 as both Octopus and Bulb approach the 3 million total accounts threshold to join OVO as one of the large suppliers.

There were 39 small and medium suppliers at the end of October 2020 (excluding white labels and License Lites), compared to 52 at the end of October 2019. EDF Energy had 4.837 million product accounts at the end of December 2020, a decrease of c.200k since the beginning of the year. EDF Energy's market share decreased from 9.5% at the end of 2019 to 9.3% at the end of 2020.

Competition in the market is driven by ongoing mergers and advancements in digital technology. In Q1 2020, OVO acquired SSE's residential supply and services business and moved up 6 places to become the 2nd largest supplier in the domestic market. E.ON's aim is to migrate Npower's domestic and SME accounts onto its new licensed Kraken platform branded "E.ON Next" by H1 2021.

Octopus continues to offer Kraken as a service to other suppliers in the UK with E.ON/Npower and Good Energy as licensees, as well as internationally to Origin Energy in Australia. Bulb and Ovo energy have also both expanded international with their respective software platforms.

Regulatory Change

Default Tariff Cap

- Ofgem introduced a cap on default tariffs for domestic customers on 1 January 2019;
- The cap level is updated to reflect revised costs every 6 months. At the end of 2020, the separate cap on tariffs for domestic customers with prepayment meters ended, but a cap for PPM customers is being included within the wider default tariff arrangements;
- In August Ofgem made a recommendation to UK Government that the default tariff cap should remain in place for 2021. In October, the UK Government announced the cap would continue for at least a further 12 months until the end of 2021;
- Ofgem has confirmed that, from April 2021, the domestic tariff cap will include an allowance for additional bad debt costs incurred by suppliers as a result of Covid-19 impacts.

Smart Metering Policy

GB energy suppliers are required to take "all reasonable steps" (ARS) to install smart meters for their domestic and small business customers before the end of June 2021.

UK Government has confirmed there will be a new obligation on all suppliers to continue installing smart meters for the period July 2021 to June 2025. The UK Government is currently consulting on the annual minimum installation targets all suppliers will have to meet for the first two years; July 2021-June 2022 and July 2022-June 2023, the targets will not be covered by ARS. These targets are challenging and there are real risks that suppliers will fail to achieve them, given that smart meters remain optional for customers. EDF and other suppliers are working with UK Government to develop future targets which strike the balance of completing smart meter roll out in a way that maintains both pace, the correct technical standards and a positive customer experience.

EDF Energy remains committed to delivering smart meters to all domestic and small business customers who want to benefit from this new technology. In 2020, EDF Energy has installed a further c.343k smart meters and at the end of 2020, c.38% of EDF Energy customers in scope for the rollout have smart meters. In total, 1.9 million smart meters have been installed to date.

EDF has continued to make progress with our Smart programme rollout with key milestones in 2020, such as:

- releasing eligibility of 348k customers for smart metering owing to progress with asset procurement and system change;
- commencing rollout of SMETS2 Pay As You Go in the northern regions of the UK;
- and progressing enrolment and adoption of SMETS1 meters to the Data Communications Company. Over 600,000 SMETS1 meters in credit mode have been Enrolled and Adopted and are operating as Smart.

EDF Energy is in consultation with Ofgem and BEIS regarding future targets and continues to have the full support and commitment of the Board of Directors to ensure it fully delivers on its regulatory commitments.

Ofgem Licensing Reforms

- Ofgem is undertaking a phased review of energy supplier licensing arrangements to ensure appropriate criteria are met by applicants and holders of supply licences, including to minimise risks and impacts of future supplier failures on consumers and remaining suppliers;
- The proposed reforms include increased regulatory monitoring of all suppliers to ensure effective risk management and more responsible governance and increased accountability measures. A final decision on an initial package of proposals was made at the end of 2020 with implementation date of 22 January 2021;
- A further consultation on more prescriptive measures to reduce the costs and impacts of supplier exits is planned for early 2021.

Covid-19

To support energy suppliers during Covid-19, Ofgem and UK Government introduced a number of financial measures:

- a requirement on network companies to allow eligible suppliers to defer up to three months the payment of network charges until March 2021;
- changes to Contracts for Difference Electricity Supplier Obligations to protect suppliers from 80% of the increase in supplier obligation costs up to £100 million;
- the introduction of a cap on the recovery of system balancing charges allowing suppliers to defer up to £100 million in charges to be spread over the 2021/22 charging period.

UK Government introduced an economy-wide "furlough" scheme to support the salaries of employees, now extended to March 2021 for companies impacted by lockdowns. UK Government also deferred VAT, with payments due from 20 March to 30 June 2020 required by March 2021, interest free.

Domestic Customer Services

In response to the Covid-19 crisis, EDF successfully transitioned its Customer Service resource to homeworking and prioritised services to vulnerable customers. Field staff supported "Force for Good" initiatives through partnerships with organisations such as Boots UK and Avicenna, completing deliveries to vulnerable customers across over 130 locations in the period April to August.

Despite industry wide challenges with customer bill shock, debt and complaints, EDF expects to achieve Citizen Advice score of 4.0 for Q4 and maintain a Trustpilot score of 4.3, which equates to 4.5 stars and a rating of Excellent.

EDF has continued to provide customers with a range of inbound contact channels, while continuing to improve our digital offering. App penetration has increase from 17% to 33% over the course of 2020 and the WhatsApp messaging channel has grown from 9k per week to 29k per week over the same period.

Non-domestic customers

In 2020, the non-domestic segment supplied a total of 29.52TWh of electricity, 1.57TWh to 214k small business customers ("SME") and 27.95TWh to medium (7.9k) and large business (54) customers ("I&C"). The business customer electricity market in the UK is c.165.6TWh in total, making EDF Energy the largest supplier to business customers by volume.

The industry has however been impacted by Covid-19 demand reduction and increasing risk of business failure given the economic downturn. A volume reduction of 3.84TWh YoY was seen across the non-domestic electricity segment in 2020, with a combined bad debt increase of £25 million YoY.

In SME, managing the risks which have arisen from the pandemic has been the primary focus for much of 2020. Steps were taken to price-in additional risk, increase credit restrictions and limit winning higher risk sectors in order to protect EDF's position. Despite this, SME has developed its channels as customer numbers grew c.9% in electricity and c.62% in gas this year.

Medium Business initially grew its volumes by c.0.95TWh in Q1 2020, following up on its 1.1TWh growth in 2019. Covid-19 particularly impacted the Hospitality and Leisure sectors with lower demand but increasing customer debt levels. Through development of its product suite, volume forecasting and credit vetting processes, EDF has recovered well following the initial Covid-19-related setback to support safe business growth.

In Large Business Sales, a targeted new-business approach has led to the successful acquisitions of 6 new customers in 2020 (a 90% increase on previous years) which include Peugeot SA and Aggregate Industries. Additionally, 31 Large Business contracts have been renewed, including Tesco and Public Sector framework TEC.

In the Export market, EDF has maintained third place in the Power Purchase Agreement market and slightly increased market share. EDF renewed the 1.3TWh per year Veolia contract which integrated innovative trading services through the Powershift platform. EDF continues to strengthen the relationship with Tesco by supporting their low carbon purchasing strategy especially their purchase of renewable power through corporate PPAs from new and unsubsidized renewable sites.

Wholesale Markets Optimisation

General principles

The policies surrounding EDF Energy's energy purchasing and risk management activities are carried out in accordance with EDF group's policies and ensure that EDF Energy's activities are optimised and its services delivered at a competitive price while limiting its gross margin volatility.

The Wholesale Markets Optimisation (WMO) Division's purpose is to manage the wholesale market risk of EDF Energy in one place within pre-defined risk limits and control framework. It provides an interface with the wholesale markets, via EDF Trading. WMO also provides modelling services to the whole of EDF Energy, as well as negotiating and managing asset backed commercial structures with third parties e.g. Nuclear Decommissioning Authority and Centrica.

Electricity sales and procurement

The power generated by the generation fleet is sold *via* the WMO Division within EDF Energy's customers business. Since April 2010, 20% of the output from nuclear generation is separately sold to Centrica, the minority shareholder of the current nuclear fleet, under the agreements entered into with Centrica. The remaining 80% is sold to WMO under the same transfer price as used for the transaction with Centrica, based on published market prices, smoothed over forward electricity prices where liquidity allows.

Over and above its own generation, EDF Energy also sources electricity through export power supplied from power purchase agreements which are mainly with renewable and CHP generators. In 2020, EDF Energy acquired approximately 7.2TWh through this channel.

EDF's innovative Powershift platform gained its first customers in 2019. It offers customers flexibility and forecasting services for storage and small scale generation to earn revenues from reducing or shifting energy demand.

For delivery in 2020, EDF Energy's net position on the wholesale market was a sale of approximately 4.2TWh (including structured trades). In 2020, EDF Energy sold approximately 36.2TWh and bought 32.0TWh.

Gas, coal and carbon rights procurement

Coal and gas contracts (physical and financial) and CO_2 emissions rights are entered into by EDF Energy to hedge the fuel requirements of its power plants, gas storage and gas consumers.

Purchases are based on generation forecasts and target fuels stock levels. In 2020, 50% of EDF Energy's coal deliveries were from domestic suppliers and 50% were from international sources.

1.4.5.1.2.5 Nuclear New Build business

New Nuclear activity

Following the final investment decision (FID) made by EDF's Board of Directors on 28 July 2016, EDF and CGN signed contracts for the construction and operation of two EPR reactors on Hinkley Point site in Somerset ("Hinkley Point C" or "HPC" project).

At the same time, agreements were signed for the development in the UK of two nuclear power plants at Sizewell in Suffolk ("Sizewell C" project, based on EPR technology) and Bradwell in Essex ("Bradwell B" project, based on UK HPR1000 technology) and the delivery of the Generic Design Assessment for the UK HPR1000 technology.

The EPR technology is already being deployed at the power stations at Flamanville in France (currently under construction and fully owned by EDF – see section 1.4.1.1.3.1 "Flamanville 3 EPR project") and at Taishan in China (active, see section 1.4.1.1.3.2 "Other New Nuclear projects – Taishan EPR").

Hinkley Point C (HPC)

Financing

EDF's share in HPC is 66.5% and CGN's share is 33.5%.

EDF has taken note of the UK Government requirement not to have the control of HPC sold down during the construction period without the prior approval of the UK Government.

Covid-19 prevention measures taken on site

The project has taken significant and multiple measures to guarantee maximum safety to workers on site and to the local community, while ensuring that the site could remain open. Implemented measures have been continuously adapted and strengthened since March 2020 to apply the best practices and to be able to keep the number of infections low. These measures include in particular social distancing, wearing of masks, enhanced cleaning, tools to reduce the risk of spread of infection and the early identification of positive cases through mass testing and the break of the chain of infection.

Thanks to these measures, the site has been kept open and running throughout 2020. However, they had a significant impact on the level of productivity. To apply social distancing, the number of workers on site was reduced by more than 50% in the second quarter of 2020. The workforce was back at the pre pandemic level at the end of the third quarter of 2020 and remained stable in the fourth quarter.

The containment measures taken at the beginning of 2021 by the UK Government have not led to a decrease in presence on site. The site continues to take all the required measures to guarantee maximum safety for the workers and the local community.

Project Costs and Timeline

A detailed review of schedule and cost has been concluded in January 2021 to estimate the impact of the pandemic so far. This review has concluded the following [1]:

- the start of electricity generation from Unit 1 is now expected in June 2026, compared to end-2025, previous target initially announced in 2016;
- the project completion costs are now estimated in the range of $£_{2015}$22 to 23 billion [2]. As a consequence, the projected rate of return (IRR) for EDF (different from the project's IRR) is estimated between 7.1% and 7.2% [3] [4];
- the risk of COD delay of Units 1 and 2 is maintained at respectively 15 and 9 months. The realisation of this risk, for which the level of probability remains high, would incur a potential additional cost in the order of $£_{2015}$0.7 billion. In this case, the IRR for EDF would be reduced by 0.3%.

The project management has set the objective to lift the Unit 1 dome at the end of 2022.

The agreements between EDF and CGN include a capped compensation mechanism between both shareholders in case of cost overruns or delays. Given the expected level of completion costs, this mechanism is applicable and will be triggered when the times comes. EDF's published IRR takes this compensation mechanism into account [3]. This arrangement is part of a Shareholders' Bilateral agreement signed between EDF and CGN in September 2016 and is subject to a confidentiality clause (see section 2.2.4 "Operational Performance", risk factor 4A Management of large and complex industrial projects including EPR").

Progress of the project

Despite the impact of the Covid-19 pandemic, major progress has been made in 2020 with the overarching priority to protect the construction critical path plan. In particular, the project has achieved 4 important goals set for 2020:

- first safety related pipework of Unit 1;
- J-0 milestone completed for Unit 2, *i.e.* the completion of the Nuclear Island common raft, in line with initial target date set in 2016;
- manufacturing of feed water tank completed for the secondary circuit of Unit 1;
- finalization of design for internal structures of the Reactor building of Unit 1.

Other major progress has been made on Unit 1. In particular, the 3.5km intake tunnel boring completion and the liner ring 1 successful lift into position in the Reactor building.

On Unit 2, significant progress was also achieved. Works on Unit 2 are carried out circa 12 months after Unit 1.

The UK EPR Design Centre opened in 2020 in Bristol to support the HPC project as well as the development of Sizewell C project (see below "Sizewell C").

At the end of 2020, the costs to date excluding interim interest for the project as a whole [5] stood at £12.1 billion (at nominal values), or £11.1 billion at real £2015 value. The interim interests stand at €518 million.

Exchanges with the UK office for nuclear safety and regulation (ONR)

The ONR has been regularly informed of the management of the Covid-19 situation and the mitigation plans implemented. Next ONR Hold Point will be the start of bulk MEH erection. In addition, agreement from ONR will be needed for the dispatch of the first components coming from Framatome and for the delivery of fuel on site.

Contract for Difference (CfD) [6]

The HPC project company, NNB Generation company (HPC) Limited and the Department of Energy and Climate Change (DECC) have agreed, on October 2015, on the full terms of the CfD for HPC, which was approved by the European Commission in October 2014, ruling that the terms complied with EU state aid rules. The Commission's decision has been challenged by Austria, which sought the annulment of that decision before the General Court of the European Union, which dismissed its action by a judgment of 12 July 2018. On 22 September 2020, the European Court of Justice rejected Austria's appeal and confirmed the Commission's decision approving United Kingdom aid for HPC nuclear power station.

The CfD was signed on 29 September 2016 alongside all the other contracts with the UK Government and it is a contract to provide security in respect of revenues generated from electricity produced and sold by HPC through compensation based on the difference between the Strike Price and the market price, for a period of 35 years from commissioning of Unit 2.

From the plant's start date, if the reference price at which the generator sells electricity on the market is lower than the strike price set under the terms of the contract, the generator will receive an additional payment. If the reference price is higher than the strike price, the generator will be liable for the difference.

The key elements of the Contract for Difference are:

- the strike price for HPC is set at $£_{2012}$92.50/MWh; strike price will be reduced to $£_{2012}$89.50/MWh if a final investment decision is taken on Sizewell C project, with further compensation from Sizewell C to HPC, in order to share UK first of a kind costs of EPR across both projects;
- the strike price is fully indexed to UK inflation through the Consumer Price Index (CPI);
- the payment term is 35 years; in case of a delay of Unit 1 leading to its commercial commissioning after 1 May 2029 or a delay of unit 2 leading to its commercial commissioning after 31 October 2029, the corresponding 35-year payment term would be decreased commensurately with the deadline overrun. Moreover, any delay in the commercial commissioning of Unit 1 exceeding 4 years after the deadline specified by the agreement for unit 2 (*i.e.* beyond 31 October 2033, unless this date is postponed pursuant to the terms of the agreement) authorises (but does not oblige) the UK Government to terminate the agreement. In view of the pandemic, HPC has made a request to the LCCC [7] to extend the COD windows, citing *force majeure* as allowed by the CfD. The investigation is underway;
- the project is protected against certain unfavourable regulatory and legislative changes; provision has also been made to review the costs (up or down depending on the assumptions used) in the fifteenth and twenty fifth years, and to review certain conditions for the costs corresponding to decommissioning and waste management operations (Funding Decommissioning Programme); no protection exists against Brexit risks, but the project has not, to date, identified any significant impacts.

There is no explicit volume guarantee in the CfD, nor is there a ceiling; however, the contract is protected against change in law risk and any curtailment on the export of electricity so that the project is put back in the same position it would have been had the change in law or curtailment event not occurred.

HPC project is protected against power market price changes during the CfD period. Post Cfd, a change in the price of electricity of $£_{2015}$10/Mwh has an impact of 0.1% on the IRR.

(1) Assuming the ability to begin a ramp up back to normal site conditions from the second quarter of 2021. Please refer to the Press release of 27 January 2021 "Hinkley Point C project update".

(2) Reminder on the costs previously announced in the Press release of 25 September 2019: $£_{2015}$21.5 – 22.5 billion. Costs net of operational action plans, in 2015 sterling, excluding interim interest and excluding forex effect versus the reference exchange rate for the project of £1 = €1.23. Costs calculated on 27 January 2021 (see press release "Hinkley Point C project update") by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index.

(3) EDF equity IRR calculated at the exchange rate of £1 = €1.13 and including the capped compensation mechanism in place between the project's shareholders. Previous IRR of 7.6% - 7.8% was based on an exchange rate of £1 = €1.15.

(4) Beyond the cost and construction time objectives, this IRR for EDF includes other structuring assumptions. In particular, it is sensitive to inflation rate assumptions and electricity price assumptions after the CfD period: a 0.1 point change in inflation has an impact of 0.1% on the IRR, a change in electricity prices of $£_{2015}$10/MWh post CfD has an impact of 0.1% on the IRR.

(5) Costs before elimination of intercompany margins which is consistent with the Project completion cost.

(6) Terms of the contract are available on the UK government website: https://www.gov.uk/government/publications/hinkley-point-c-documents.

(7) Low Carbon Contracts Company.

Principal project risks

These risks are detailed in section 2.2.4 "Operational performance – 4A – Management of large and complex industrial projects (including EPR)".

As with any project of this scope, the project presents important risks in terms of timing and budget overruns at the end of the project.

In terms of foreign exchange, c.1/3 of the project costs are denominated in Euro. This exposes both the project and EDF group to the GBP/EUR exchange rate.

Should sterling fall against the euro, the Sterling cost of the project will go up and its IRR will therefore drop. A hedging strategy has been implemented at project level to limit exposure of Euro spending.

Nevertheless, at EDF group level, a Sterling devaluation will trigger a fall in euro funding requirements and therefore lower Group debt. Given the long-term investment horizon in the HPC project, EDF group is implementing a gradual strategy to cover the risk of an increase in sterling value for its HPC investment. Beyond the commissioning phase, the IRR of the euro investment is mainly dependent on fluctuations in sterling and UK inflation (in relation to the July 2017 baseline), as revenue is generated in sterling and linked to inflation.

The project is exposed to fluctuations in electricity prices beyond the CfD period. A change in the price of electricity of $£_{2015}10$/MWh has an impact of 0.1% on the IRR.

Funded Decommissioning Programme (FDP)

Contracts for the Funded Decommissioning Programme (FDP) were signed on 29 September 2016. There is a statutory requirement for nuclear operators to have a FDP, under which an independent Fund Company will collect contributions and manage the money built up to pay for decommissioning of the nuclear reactor at the end of the generation.

The Nuclear Decommissioning Fund Company (FundCo) was set up in compliance with the Energy Act 2008 as its purpose is to provide costs of decommissioning by implementing the FDP.

The overall objective of the FDP is to ensure that operators make prudent provision for:

- the full costs of decommissioning their installations;
- their full share of the costs of safely and securely managing and disposing of their waste (including long term storage); in doing so, the risk of recourse to public funds is remote.

Sizewell C

EDF and CGN signed the Sizewell C Project equity documents on 29 September 2016 alongside the HPC contracts, for the development, building and operation of two EPR reactors (3.2GW) at Sizewell in Suffolk.

During development phase previous to final investment decision, EDF's share is of 80% and CGN of 20%. EDF has planned to pre-finance the development up to its share of an initial budget of £458 million.

Final investment decision is likely to be made by mid-2022. If it is postponed, an agreement should be reached on the financing of the additional costs incurred.

This project is based on the assumption that third party investors will invest a very large majority and EDF plans, at the date of the final investment decision, to become a very minority shareholder with corresponding limited rights and to deconsolidate the project from the Group's financial statements (including in the calculation of economic indebtedness by the rating agencies). At this stage, it is not certain that the Group will achieve this objective.

This financing model has never been implemented for projects of that scale before and therefore would be one of the largest ever equity issuance and project financing on the European scene. Securing the appropriate risk-sharing mechanism and ultimately the corresponding financing structure ahead of the Final Investment Decision is therefore key for the project, the UK Government and the current shareholders. EDF's ability to make a final investment decision on Sizewell C and to participate in the financing of this project beyond the development phase could depend on the operational control of the Hinkley Point C project, on the existence of an appropriate regulatory and financing framework, and on the availability of sufficient investors and financiers. None of these conditions are guaranteed at this time.

Failure to obtain the appropriate financing framework and appropriate regulation could lead the Group not to take the investment decision or to take a decision under less than optimal conditions (see section 2.2.4 "Operational Performance", risk factor 4A "Management of large and complex industrial projects including EPR").

Project development is based on a replication strategy from HPC which should enable costs to be driven down thanks to a decrease in construction costs combined with lower risks. The Sizewell C nuclear power plant would therefore also be based on the EPR technology, EDF being in charge of the replication of the design, and would benefit from feedback and experience from HPC.

The development of the Sizewell C project achieved major steps in 2020. In June, Planning Inspectorate accepted the application for the Sizewell C development consent order for examination. The examination process is expected to start in April 2021, meaning the Secretary of State should make their decision on the planning permission by April 2022. The development consent order document includes a very ambitious target of savings on construction costs to take into consideration the fact that Sizewell C is a second of a kind.

The UK Government made a major announcement end of 2020 to set out how to achieve the ambition to net zero emission in 2050. On 18 November, a 10-point plan for a Green Industrial Revolution was issued, including a commitment to advancing nuclear as a clean energy source, across large scale nuclear and developing the next generation of small and advanced reactors, acknowledging the important role large scale nuclear will play in delivering the UK's future low-carbon energy mix. The UK Government will contribute up to £385 million to an "Advanced Nuclear Fund", of which £215 million will be invested in the development of British Small Modular Reactor (SMR) technology. The remaining £170 million will be dedicated to a research and development programme on Advanced Modular Reactors (AMR).

Building on this plan, the Energy White Paper released on 14 December 2020 sets out the steps the UK Government will take over the next decade, including the ambition to bring at least one large scale nuclear project to the point of Final Investment Decision by the end of this Parliament period (2024), subject to evidenced value for money and the satisfaction of the UK Government's legal, regulatory and national security requirements.

In parallel, the UK Government stated that it was to enter talks with EDF on the funding of the Sizewell C project as it considered options to deliver this ambition. The Government also stated that it continues to explore a range of financing options for new nuclear including the Regulated Asset Base (RAB) funding model. In addition, given the scale of the financial challenge, the UK Government could consider participating in financing during construction, provided there is clear value for money for consumers and taxpayers.

Generic Design Assessment UK HPR1000 – Bradwell B

The cooperation between EDF and CGN encompasses the process to obtain the design certification of the Chinese-based design HPR1000 in the UK (UK HPR1000) by the Office of Nuclear Regulation and by the Environment Agency through the Generic Design Assessment (GDA) process. For that purpose, EDF and CGN have established a joint-venture, General Nuclear Systems Limited (GNS) (33.5% EDF – 66.5% CGN). The GNS joint-venture Shareholders' Agreement was signed on 29 September 2016.

The HPR1000 technology has been developed by CGN with a reference project under construction in China (FangChengGang 3-4).

The GDA is a 4 steps process, which started in January 2017, the first three steps have already been successfully achieved. Step 4 started in February 2020 and should be completed in the first quarter of 2022. Nevertheless the Environment Agency has told CGN that it must resolve at least six safety issues before it can move forward and the analysis is currently ongoing.

In parallel, EDF and CGN signed the Bradwell B Project Shareholders' Agreement on 29 September 2016 which sets out the framework for the development of a nuclear generation facility at Bradwell-on-Sea using the UK HPR1000 technology. To date, during development phase prior to final investment decision (FID), CGN has a 66.5% interest and EDF of 33.5% interest.

Due to Covid-19, some works carried out by Bradwell B have been delayed, such as site feasibility studies. As a consequence, and considering the uncertainties, Bradwell announced in the beginning of 2021 that it will be prioritising technical aspects and that aspects of the project it is not yet ready to progress will be paused.

Insofar as the projects Sizewell and Bradwell involve EDF and CGN, they are likely to be impacted by changes in diplomatic relations between the United Kingdom and China (see section 2.2.4 – risk 4A).

1.4.5.1.3 Brexit

The UK voted to leave the membership of the European Union (EU) on 23 June 2016 (also see section 2.2.1 "Market regulation, political and legal risks") and officially left the EU on 31 January 2020. Thereafter, it entered into a Transition Period (TP) that ended on 31 December 2020.

During the TP, for most EU and UK businesses including EDF Energy, transactions were mostly unchanged particularly with respect to trade, access to labour/services and the business rules & regulations that govern business operations.

During the TP, the EU and UK negotiated a Free Trade Agreement (FTA) that was eventually agreed on 24 December 2020. The negotiations throughout 2020 were relatively slow and difficult, being hampered of course by the Covid-19 pandemic that impacted progress and the breadth and depth of the final agreement in some key areas, including energy trading and carbon pricing.

The FTA sets the basis for the EU-UK relationship since 1st January 2021, together with a separate Nuclear Cooperation Agreement (NCA) that sets the basis for the specific future civil nuclear relationship.

Given the relatively limited FTA deal that has been agreed in a number of important areas, it is recognised that further work is required and will take place in 2021 and beyond to finalise some important details and this will deliver the more substantial and stronger trading relationship for the longer term.

Because of uncertainty and the delay in finally agreeing a FTA until very late in the year, EDF Energy worked very closely with EDF group, to prepare for a "no-deal" EU-UK outcome at the end of 2020. The relatively thin/limited nature of the FTA in key areas, combined with some companies (particularly small and medium sized) not being fully prepared for the new EU-UK trading arrangements from 1st January means that the scenario facing EDF Energy, during the early months of 2021, will feel similar to a "no-deal" situation.

This will probably impact both:

- the smooth operation of EU and UK customs processes, creating some difficulties/disruption for both prepared and unprepared organisations; and
- directly and indirectly the efficient operations of some EU and UK businesses.

EDF Energy's assessment is that specific EDF business sector risks around energy trading, carbon pricing and nuclear, are likely lower and more manageable.

All EDF business units (BUs) are therefore exposed to business disruption risks (negative impacts) associated with the UK exit from the EU from 1 January 2021, but are prepared. A co-ordinated effort over the last 3 years has meant BUs have worked closely together within EDF Energy and with EDF group colleagues (where appropriate), UK Government and trade associations to limit potential risk exposure and the scale of any potential business impact. The comprehensive company-wide impact risk assessment exercise has led to the development and implementation of a number of mitigation actions required to address the key risks. However, inevitably some issues will arise that had not been foreseen. EDF Energy will continue to monitor the situation and adapt and respond as necessary, liaising with and seeking support from UK Government as appropriate.

1.4.5.2 Italy

1.4.5.2.1 EDF group market and footprint in Italy

Italy is one of EDF's four key markets in Europe alongside France, the UK and Belgium.

The Group is mainly present in Italy through its 97.446% shareholding in Edison [(1)], which is a major player in the Italian electricity and gas markets and a well-known Italian brand.

In line with Edison's strategic goal of becoming a key player on the Italian renewable energy market as part of energy transition, in 2019 Edison bought out EDF Renewables' 100% stake in EDF EN Italia Spa (EDF EN Italia) which owns a portfolio of wind farms totalling 216MW and 77MW [(2)] of solar power installations. The transaction simplified EDF's activities on the Italian market, a process begun with the contribution of Fenice to Edison in 2016.

The EDF group is also present in Italy *via* Citelum (see section 1.4.6.1.2 Citelum).

1.4.5.2.2 Edison strategy

Like the majority of European energy systems, the Italian market is currently facing a certain number of challenges. Thanks to its current position and integrated presence in the sustainable gas and electric power value chain, Edison is well-placed to seize opportunities created by market changes, while pursuing efficiency and profitability, in line with the CAP 2030 priorities and international and Italian energy policies.

During 2020, Edison pursued the implementation its transformation strategy, designed to pursue its repositioning as a responsible leader in the context of energy transition. The company concentrated on streamlining and extending renewable generation with low CO_2 emissions, the construction of two latest generation gas-fired power plants, and the development of energy services.

At the same time, the disposal of most of the oil and gas Exploration & Production (E&P) activities (excluding Algeria and Norway) to Energean and the upcoming disposal of E&P activities in Norway to Sval Energi [(3)] will enable it to refocus on its strategic activities, in line with the priorities of the Italian National Plan for Energy and Climate (*Piano Nazionale Integrato Per l'Energia e il Clima 2030*).

In mid-February 2021, Edison announced the conclusion of the purchase of the 70% stake not yet held in E2i Energie Speciali's wind power business with the *Fondi Italiani per le Infrastrutture* (F2i). Edison is also to sell Infrastrutture Distribuzione Gas to 2i Rete Gas. The two agreements signed with F2i and 2i Rete Gas fall within Edison's strategy aimed at increasing renewable energy production to 40% of the production mix by 2030, whilst at the same time withdrawing from non-strategic activities [(4)].

Going forward, the main avenues of development are as follows:

- **power generation**: Edison aims to increase its renewable energy generation by promoting specific capital investments in hydro power, wind power and solar power projects to optimise its electricity generation portfolio in Italy and to reduce its carbon emissions. Another of its goals is to enhance its high-performance, low-emission thermal production assets, developing new gas power plants to supplement renewable production resources.

  Against this backdrop, in 2020 Edison pursued the construction of two new-generation CCGT plants in Marghera Levante and Presenzano, which given the planned commissioning dates would benefit from the contribution of the capacity market. In the field of renewables, the company has begun the construction of around 90MW [(5)] of wind power and solar installations and started reorganising its activities in order to set up an integrated platform on which to base its future growth;

(1) Equity stake; 99.474% share of voting rights.
(2) Consolidated capacity; 75MW net capacity.
(3) See the Edison press release dated 30 December 2020.
(4) See the Edison press release dated 14 January 2021.
(5) 43MW reconstruction of wind power installations and 45MW construction of solar power installations.

- **service offering**: Edison's goal is to strengthen its position on the Italian market by means of an innovative offering, in particular through the development of energy services designed to the end market, in particular for domestic consumers and industrial, services, and public administration customers. This aim draws on the brand's strong positioning, a diversified offering, and on synergies resulting from the strategy of organic growth of its gas and electricity customer portfolio for the residential and industrial segments;
- **gas**: Edison is the EDF group's gas platform. Thanks to skills being brought together, since 2017 the company has had a service agreement with EDF enabling it to provide integrated management of all assets and develop EDF's upstream gas business (in particular the supply of gas and LNG, contract management, medium to long-term optimisation, transport, and storage).

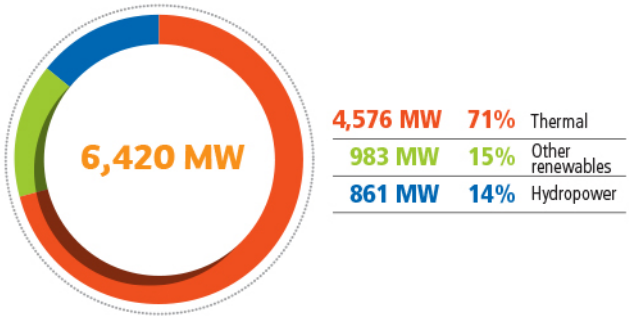
  The Group also benefits from EDF Trading, responsible for asset optimisation, as well as from short-term operations dealing with interventions on wholesale markets on the continent and in the UK.

  Over and above optimising the Group's gas business portfolio, Edison contributes to reducing its emissions for maritime and road transport, with the construction of a supply chain for marketing small-scale LNG.

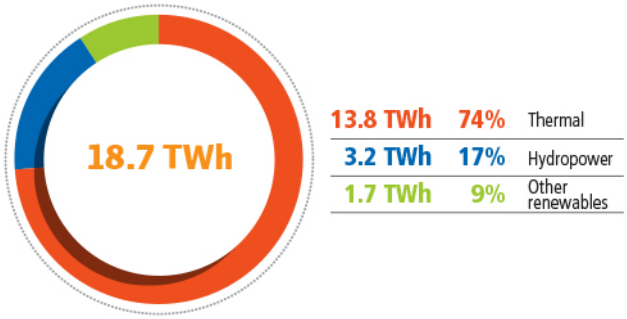
1.4.5.2.3 Edison's business

Installed capacity and output of Edison in Italy [1] – 2020

Installed capacity
In MW



Electricity Output
In TWh



(1) Consolidated data, including generation and services of energy efficiency with the customers.
NB: The values take into account roundings.

In 2020, electricity and gas consumption on the Italian market were affected by the restrictions imposed due to the health crisis, mainly during the first half of the year. Italian energy consumption amounted to 302.8TWh, 5.3% lower than in 2019.

Net output of 273.1TWh [1] covered 90% of national consumption, compared with 88% the previous year, thanks to net imports decreasing significantly by 5.9TWh (-15.6% compared to 2019). Thermal power production, which amounted to 175.4TWh in 2020 (11.9TWh less than in 2019) recorded the largest decrease, followed by wind power production (18.5TWh, down 7.4% on 2019). However, other renewable energy sources performed well, with a 9.6% increase in solar power compared to 2019 (25.5TWh).

Based on power generation data for 2019 [2], Edison is the third-largest producer at the national level, after Enel and Eni. In 2020 its net power output in Italy was 18.8TWh [3] which accounted for around 6.9% of net Italian electricity generation.

National demand for gas was 70.7 billion cubic metres, down by 4.1% in comparison with 2019 due to a 5% decrease in the use of gas for electricity production. In spite of the sharp drop in March, April, and May due to Covid-19 prevention measures applied to non-essential sectors, industrial consumption fell less, recording a drop of around 5.8%. Domestic consumption dropped by around 0.6 billion cubic metres compared to 2019; however, the drop in consumption recorded in the first two months of the year was compensated for by higher consumption in the fourth quarter due to colder weather.

Gas imports to Italy accounted for 93% of national demand. Edison carried out 18.6% of these imports, a total of 12.3 billion cubic metres.

By the end of 2019, the capacity market was established in Italy, with the launch of two consignment auctions in 2022 and 2023. Edison won 2.8GW of existing capacity for both years, and a total of 1.4GW of new capacity benefiting from a fixed contribution of €75,000/MW for 15 years. Thanks to its contribution to the capacity market, Edison's margins will increase appreciably and become more foreseeable.

(1) Excl. pumping.
(2) Data published by ARERA (ARERA report, vol. 1, p. 89, fig. 2.1); 2020 data will be released in mid-2021.
(3) See detailed output data (including energy efficiency services) in the chart below.

Regulatory notice

The new capacity market in Italy

Outline

A capacity mechanism was launched in Italy in 2019: it was validated as state aid by the European Commission on 14 June 2019 (State Aid number SA.53821) until the end of 2028; an implementing decree was issued for this mechanism by the Minister for Economic Development on 28 June 2019. Terna, the Transmission Network Manager, defined the rules after consultation with stakeholders, and the first auctions took place in November 2019 for the 2022 and 2023 delivery years.

The capacity mechanism implemented in Italy is a "Market Wide" mechanism (remunerating all capacity required to meet security of supply criteria), with centralised "pay as clear" auctions, price zones in case of potential congestion and carbon emission limits. Capacity availability is primarily encouraged through the "reliability option" system specified below.

Fixed premium

Selected capacity is remunerated by a fixed annual premium stated in Euros/MW/year (paid monthly during the delivery year). Prices are established by cross-referencing a demand curve produced by Terna with a supply curve (bids at auctions).

A bid cap for existing capacity is set within a range of between €25,000/MW/year and €45,000/MW/year (€33,000/MW/year for the 2022 and 2023 delivery years).

A bid cap for new capacity is set within a range of between €75,000/MW/year and €95,000/MW/year (€75,000/MW/year for the 2022 and 2023 delivery years).

Incentives for capacity availability:

The "reliability option" scheme adopted by Italy involves a "repayment obligation": the selected capacities must pay Terna the positive difference between a reference price and a predetermined strike price, whether or not the capacity is available at that time.

The reference price is based on the day-ahead market price and the balancing (adjustment) price of the price zone where the capacity is located. The strike price is set at the level of the standard hourly variable cost of the technology with the highest variable costs (*i.e.* the peak technology). The peak technology chosen by the Authority for 2022 and 2023 is the OCGT (open-cycle gas turbine), with a variable production cost of €125/MWh in 2017.

Carbon emission limits

New and refurbished capacity is only eligible for the capacity mechanism if it does not emit more than 550g of fossil-fuel carbon emissions per kWh of electricity. Existing generation capacity is only eligible for the capacity mechanism if it does not emit more than 550g of fossil-fuel carbon emissions per kWh of electricity. If this limit is not respected, existing capacity may still be eligible if it commits not to emit more than 350kg of fossil-fuel carbon emissions on average per installed kWe for a given delivery year.

With respect to hydro power, the "certification decree" (law dated 11 February 2019, no. 12) covering national regulation of concessions for hydro power diversions was approved in law. The new provisions cover the allocation and fees for concessions, and must be implemented in specific regional laws. To date, only a few regions have passed these laws, the implementation of which requires regional administrative instruments (notably regulations); these are in progress.

1.4.5.2.3.1 Electricity generation

In Italy, as of 31 December 2020 Edison's installed capacity (excluding energy efficiency services) amounted to 6.3GW, with net electricity production of 18.1TWh in 2020, a decrease of almost 12.4% from the 2019 figure.

Edison's generation fleet is currently made up of 89 hydropower plants, 14 thermal power plants, 43 wind farms and 64 photovoltaic plants. Combined-Cycle Gas Turbines (CCGT) account for 72.8% of electricity generation, while hydropower accounts for 17.7% and combined wind and other renewable energies for 9.6%.

The downturn in Edison's production is due mostly to the fall in thermal power production (13.2TWh, down 17.1% on 2019), itself due in part to reduced consumption nationwide and in part to the shutdown of two power plants in the early months of the year.

In 2020, Edison's hydro power output totalled 3.2TWh (stable compared to 2019), resulting from the operation of some 0.9GW of hydro power installations in Italy, approximately 70MW of which was from "mini hydro power" installations, some of them located on irrigation canals in Piedmont and Lombardy.

Wind power and other renewable energy production amounted to 1.7TWh (up 10.6% on 2019) in 2020, due in particular to the acquisition of EDF EN Italia plants from EDF Renewables in July 2019.

In the field of renewable energy, Edison has installed capacity of 1GW, making it the second-largest wind power operator on the Italian market after ERG [(1)]. Edison operates wind power production mainly through E2i (Energie Speciali srl) [(2)], which holds some 680MW of renewable assets (at 31 December 2020), with all of the energy produced being transferred to Edison pursuant to the integrated management of its production portfolio.

In line with Italy's National Plan for the Climate and Energy, which supports the development of gas-powered electricity production and its integration with renewable production to ensure the flexibility and security of the national electricity system, in 2019 Edison started work on the first new-generation combined-cycle gas power plant (CCG) on the site of the Marghera Levante power plant (780MW). Construction of a 760MW greenfield project using the same technology at Presenzano, Campania, began in 2020. These two installations are highly flexible and efficient (with energy efficiency of 63%), have a low environmental impact (with CO_2 emissions 40% lower than the national average and 70% fewer NO_x emissions); power generation should begin in 2022 and 2023 respectively. The two power plants should benefit from the fixed contribution of €75,000/MW for 15 years linked to the capacity market, with a positive impact on the volatility of Edison's margins, subject to the commissioning date deadlines being met.

Edison's strategic role in energy transition in Italy has been recognised by the European Investment Bank (EIB). In 2020, it granted Edison two long-term loans: one worth €150 million to support the reconstruction of the new-generation Marghera Levante combined-cycle gas power plant (CCG); the second, worth €300 million (the first Green Framework Loan in Italy) is for the development of a portfolio of projects in the field of renewable energy production and energy efficiency services.

Internationally, Edison is well-established in Greece, where it owns a 50% stake in ElpEdison SA, one of the country's main electricity operators (with Hellenic Petroleum owning the other 50% stake). ElpEdison serves 280,000 customers and owns two CCGT plants: one in Thessaloniki (400MW) and the other in Thisvi (410MW) built by Edison, which sells electricity on the domestic market.

Last, Edison holds a 50% stake in Ibiritermo, a subsidiary in Brazil, which operates a 226MW CCGT plant, and a 20% stake in Kraftwerke, which operates 626MW of hydropower in Switzerland.

(1) Data published by ANEV (page 11 of the ANEV 2020 Brochure), taking into account the capacity of EDF EN Italia and E2i.

(2) A company set up in 2014 in partnership with the F2i fund, which owns a 70% stake; the remaining 30% is owned indirectly by Edison.

1.4.5.2.3.2 Gas business

For the implementation of its gas strategy, the EDF group, through Edison, benefits from experience along the entire value chain of natural gas.

Edison's Italian gas supply portfolio is based mainly on a series of long-term agreements. As of the end of 2020, these covered approximately 12.3 billion cubic metres of imports *via* gas pipelines and LNG from Libya, Qatar and Algeria, and 4.4 billion cubic metres bought on the market or produced in Italy or abroad by E&P.

In 2020, total sales of gas in Italy amounted to 16.6 billion cubic metres (compared with 20.0 billion cubic metres in 2019). Edison delivered 5.2 billion cubic metres of gas to the industrial sector, 2.1 billion cubic metres to the domestic sector, 5.7 billion cubic metres to the thermoelectric sector (including Edison's own requirements), 3.5 billion cubic metres on the wholesale market, and 0.1 billion cubic metres of sales of production abroad.

With the goal of increasing its competitiveness and reinforcing the gas supply system in Italy following the TAP gas pipeline coming on stream, in 2021 Edison should begin to import one billion cubic metres of gas per year from Azerbaijan under a 25-year contract. Edison has signed a new contract for one million cubic metres of gas from Russia for 2021.

On 17 December 2020, Edison announced the disposal of its oil & gas exploration and production activities to Energean, excluding Algeria and Norway. The value of the assets disposed of amounts to $284 million, with a positive effect on Edison's net financial position in 2020 of around $230 million, plus a net cash surplus generated between 1 January 2019 and the date when the disposal agreement was entered into. The agreement provides for a subsequent price supplement of up to $100 million after the start of gas production at the Cassiopea gas field.

On 30 December 2020, Edison announced the signature of the agreement with Sval Energi for the disposal of 100% of Edison Norge AS, which owns the oil & gas exploration and production business located in Norway. The agreement was determined on the basis of an enterprise value of $300 million on 1 January 2020. The impact on Edison's net financial position is currently estimated as being appreciably higher than this value.

Gas infrastructures

Edison contributes to the development of gas import infrastructure projects (see section 1.4.6.2.2.2 "Infrastructures") through IGI Poseidon, in which Edison owns a 50% stake. IGI Poseidon is promoting the following three projects:

- Eastmed, an interconnection between Greece and the eastern Mediterranean which will provide direct access to gas resources in the eastern Mediterranean (Israel, Cyprus), connecting them to Greece. The project is still in the pre-development stage;
- Poseidon, an interconnection between Greece and Italy, which will allow gas resources to be transferred from Greece to Italy by connecting to Eastmed. The project is still in the pre-development stage;
- IGB, a gas pipeline belonging to ICGB, in a 50/50 partnership with Bulgarian Energy Holding, connecting Greece and Bulgaria. The gas pipeline, now over 20% complete, will be 182km long and have a transmission capacity of 3 billion cubic metres per year.

These projects are among the European Commission's Projects of Common Interest, and benefit from EU aid: IGB has received €84 million for its construction and Eastmed will receive a matching contribution covering 50% of its development costs.

Edison also has the right of use of 80% of the Rovigo offshore regasification terminal's capacity (6.4 billion cubic metres per year) where LNG imported from Qatar with Ras Laffan Liquified Natural Gas Company Limited II (RasGas II) is regasified.

Concerning LNG, since 2018 Edison has been engaged in the "small-scale LNG transportation" project for the development of an LNG marketing supply chain, with the aim of helping to reduce emissions by maritime and road transport. During the first phase, the project comprises the construction by Depositi Italiani GNL (in which Edison owns a 30% stake [1]) of an onshore depot at the port of Ravenna where the LNG will be stored at a small, dedicated LNG terminal. The facility, now 80% complete, will have a capacity of over 1 million cubic metres of LNG per year (Edison will have right of use to 85% of its capacity) and will be able to supply LNG to 12,000 trucks and up to 48 ferries.

In October 2020, Edison and Kuwait Petroleum Italia (Q8) presented a joint project for the construction of an onshore deport at the port of Naples. This project is still in the pre-development stage.

1.4.5.2.3.3 Sales and marketing

In 2020, Edison sold 30.3TWh of electricity in Italy (compared with 31.2TWh in 2019, *i.e.* down 2.6%), of which 18.1TWh were generated [2] and 12.2TWh were purchased on the markets. Sales to end customers amounted to 15.5TWh, up 4.3% compared to 2019, thanks to the increase in volumes agreed during the previous sales campaign. This increase was partly offset by a drop in consumption, in particular in the industrial sector, due to the enforcement of lockdown caused by the health crisis.

At the end of 2020, Edison was serving around 1.53 million customers in electricity and gas, in the business and domestic segments.

Development of marketing continues to be a priority for Edison, being seen as a foundational business to support expansion into the field of energy services and renewable production. During recent years, the company has reinforced its innovative services platform for domestic customers with a full range of household products: domestic appliance maintenance and home insurance (through Assistenza Casa, wholly owned by Edison), domestic solar power and electric mobility and home services; the most recent launch is "Edison Risolve" with a laundry service, home cleaning, building renovation advice, etc.

To strengthen customer relations, Edison operates across Italy with 613 sales outlets [3]. Furthermore, in 2020, the company strengthened its position in digital sales to rise to the challenges of the health crisis. In parallel, Edison intends to maintain its position as a leader in the business-customer market by developing an advisory approach in energy as well as innovative products and services made possible by market and regulatory changes. As in the domestic segment, B2B customers can benefit from an environmentally-friendly offering combining solar power, batteries, and the use of electric vehicles.

The improvement of the sales and customer-service processes conducted in recent years won Edison third place in the national "Altroconsumo" ranking, a consumer association that is very popular in Italy. Growing customer satisfaction, combined with the development of low-carbon offers and value-added services targeted by segment should strengthen ties with the end market and increase the customer base.

1.4.5.2.3.4 Energy services

Edison develops, sells and manages energy and environmental services *via* a dedicated business unit called "Energy Services Market Division" (ESMD).

The solutions on offer are dedicated to the development of energy efficiency projects aimed at major industrial customers, businesses, and public administrations, growing sectors in which the Division is seeking to consolidate its position. The offer available to customers also includes help with complying with environmental standards on their sites, as well as environmental services offered by the Sersys Ambiente subsidiary (consultancy, wastewater treatment, sampling and analysis of environmental matrices, waste disposal, and industrial cleaning).

The business models are adjusted to customer requirements: the Division designs, builds, and manages assets for its customers, including cogeneration/tri-generation plants, solar power installations, substations, thermal power plants for industrial use, cold production plants, compressed air plants, fluid distribution systems (electricity, gas, hot and refrigerated air, compressed air, industrial gas, water) and industrial water treatment plants. The range of services is completed by a consulting activity in terms of energy, management of environmental securities and internal and external training for customers and partners.

(1) A 19% stake is held by Scale Gas Solutions (a company controlled by Enagas), and a further 51% stake by Petrolifera Italiana Rumena.

(2) Production data calculated in line with consolidation criteria.

(3) Only a small part of which is owned by Edison.

The Division's clients are in the industrial and business sectors; contracts with the FCA group still form a large part of the business with major-account customers. Due to the health crisis and measures imposed to prevent the spread of the virus, FCA had to suspend its production activities for several weeks, and the automotive market saw its sales plummet for several months. Consequently, discussions were undertaken to find acceptable solutions for the parties with a view to overcoming the difficulties encountered (to date, these discussions are still ongoing).

Projects are developed with customers in the form of industrial partnerships or performance agreements. The business model can be adjusted to customer requirements, and may range from customer assistance to third-party financing or direct investment by Edison in the projects (the Esco model).

Edison is active in the public services sector *via* Edison Facility Solutions, which specialises in energy efficiency and integrated energy management, notably for hospitals in the North and centre of Italy. This year, due to the health crisis, the public health sector has been especially impacted, with its activities being reorganised to cope with the situation. This has had repercussions on the company in terms of delays in the completion and commissioning of certain projects.

Lastly, energy efficiency activities are conducted internationally by subsidiaries in Spain, Poland, and Morocco, all of which are wholly owned by Fenice.

1.4.5.2.3.5 Regulated activities

Gas storage

Edison owns 100% of the Edison Stoccaggio company, dedicated to regulated gas-storage activities. Edison also operates three storage facilities in depleted reservoirs (fields which have been depleted of natural gas): Cellino (since 1984), Collalto (since 1994) and San Potito & Cotignola (since 2013). The volume being worked upon on all of the sites is 1 billion cubic metres.

Distribution

Gas distribution in Italy is regulated and supervised by ARERA, the electricity and gas authority that establishes, in particular, quality and safety parameters, as well as network access rules.

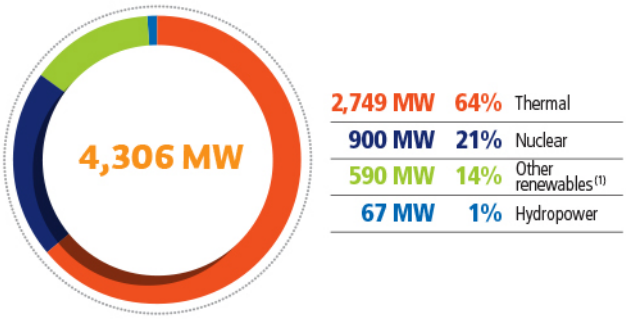
Infrastrutture Distribuzione Gas SpA is the company dedicated to the distribution of natural gas within the Edison group. In order to refocus on its strategic activities, in January 2021 Edison announced the signature of an agreement with 2i Rete Gas for the disposal of the entirety of this company.

1.4.5.3 Other international

Installed capacity and output of "Other international" - 2020

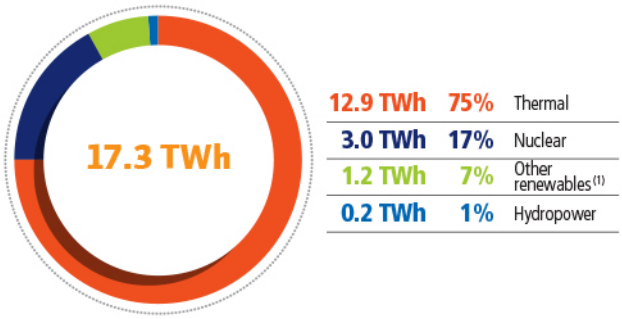
Installed capacity

In MW



Electricity output

In TWh



(1) Excluding data for EDF Renewables, see section 1.4.1.3.3 "EDF Renewables activity".
NB: The values take into account rounding.

1.4.5.3.1 Northern Europe

Belgium

The Benelux region features important interfaces with the Franco-German electricity marketplace and projects for new links with Germany and with Great Britain are being examined. Benelux also constitutes an important node in the European gas market because of its numerous import and transit infrastructures, such as the Zeebrugge hub and the Dunkirk LNG terminal nearby.

The EDF group is present in Belgium through EDF Belgium, Luminus and Citelum.

EDF Belgium

As part of a long-term nuclear energy cooperation agreement with Electrabel, EDF holds 50% in undivided co-ownership of the Tihange 1 nuclear power plant, through its wholly-owned Belgian subsidiary, EDF Belgium. The capacity attributed to EDF represents 481MW (or 2% of Belgian generation capacity). Tihange 1 output, which is attributed to EDF Belgium is sold to EDF (*via* a long-term contract renewed at the end of 2015 for 10 additional years) which, in turn, resells the electricity to Luminus at a market price.

Belgium's 2003 nuclear phase-out legislation originally provided for the closure of Tihange 1 on 1 October 2015. Nevertheless, it was finally decided to extend its operation upon 2025, following the adoption in 2012 by the Belgian government of the Equipment Plan, and the Law of 2013 amending the Law of 2003 pertaining to the timeframe for the phasing out of nuclear energy. This extension was the subject of an agreement concluded on 12 March 2014 between Electrabel, EDF and the Belgian State, defining its terms and conditions.

The extension of the lifespan of Tihange 1 requires significant investment, with EDF's share amounting to around €320 million, spread over the period from 2011 to 2021.

Luminus

At the end of 2020, the EDF group held 68.63% of the Luminus company through its subsidiary EDF Belgium, with the remaining equity held by Belgian public shareholders.

Luminus is the second largest player in the Belgian energy market after Engie Electrabel, and it holds a balanced upstream/downstream portfolio. The company, whose market share is close to 20%, possesses almost 10% of total Belgian generation capacity with 2,283MW installed at the end of 2020. The electricity generation of Luminus reached 7.6TWh in 2020. The company employs around 2,100 people.

As part of the Group's CAP 2030 strategic plan, Luminus has the ambition of developing its wind farm fleet and accelerating the deployment of its energy services in order to provide its customers with innovative and sustainable solutions, whilst pursuing its objective of reducing costs and rationalising its thermo-electrical generation fleet.

Luminus owns 10.2% (419MW) of Belgium's Tihange 2 and 3 nuclear power plants (commissioned in 1983 and 1985 respectively) and the Doel 3 and 4 plants (commissioned in 1982 and 1985 respectively), which have a lifespan of 40 years.

Luminus also has 100MW drawing rights on the French Chooz B nuclear power plant, based on a band of guaranteed output according to the average availability of the French fleet.

Apart from the drawing rights in the nuclear fleet, Luminus also possesses a thermal fleet comprising several power plants (combined cycles and open cycles) for an installed capacity of 1,208MW.

The Seraing steam gas turbine met its strategic reserve obligation for the period from November 2017 to the end of October 2018. It is now back on the market.

Luminus also operates in renewable energy. The company operates 7 hydropower plants, and as of the end of 2020 owns 70 onshore wind farms, with a total of 238 turbines across Wallonia and Flanders. Since the end of 2015, the company has been the leader in onshore wind farms in Belgium and has an installed capacity of 588MW at the end of 2020. In 2020, Luminus erected 22 wind turbines for a total capacity of 70MW.

Under its "Luminus" brand, EDF Luminus supplies electricity and gas to around 1.6 million residential and business customers (number of delivery points) in Belgium. The company is involved in the energy services segment for residential customers through its subsidiaries Rami Services, Dauvister, Leenen, and Insaver, mainly by providing boiler installation and maintenance, installing solar panels, and providing "Home Assistance" services in the event of unexpected damage at home. At the end of 2020, the B2C portfolio for these last three services exceeded 165,000 contracts thanks to bundle sales through Luminus website.

For its industrial customers, Luminus together with ATS, Vanparijs, Dauvister and Newelec, offers comprehensive integrated electricity and heating solutions. In addition, its subsidiary Luminus Solutions (in which Luminus and Dalkia own a 51% and 49% stake respectively) provides energy efficiency services for administrative buildings, hospitals, schools, sports facilities, swimming pools and apartment complexes on the basis of an energy performance contract.

In 2019 and 2020, Luminus continued its strategy of expansion into energy services, broadening its presence upstream in the value chain with the acquisition of design firm De Klerk Engineering and ERVAC (*via* Newelec), specialising in heating, ventilation, and air conditioning control (HVAC). ATS continued with organic and non-organic growth in existing fields, acquiring Censatach, Elektriek, CDL Engineering, Elektrotech VVV, and Westelec).

Citelum

In Belgium, renovation work on the LED lights on Wallonia's motorway network has continued. In 2020, several use cases for smart lighting have been implemented with the installation of various traffic and detection sensors, as well as an interface with the centralised remote management system based on MUSE®. The 20-year PPP agreement for the design, modernisation, funding, management, and maintenance of 100,000 lights was awarded to the LuWa consortium (comprising Citelum (lead contractor), Luminus, CFE, and DIF) in 2019. Ultimately, this will result in 76% energy savings, avoiding the equivalent of 166,000 tonnes of CO_2 emissions.

The Netherlands

Through a joint venture, Sloe Centrale BV, the EDF group and PZEM Group (formerly Delta) (each holding 50%) own an 870MW CCGT power plant in the southwest of the Netherlands, whose two 435MW units were commissioned in 2009. Thanks to its excellent technical performance, further enhanced by recent innovations and optimised renegotiation of the maintenance agreement with Siemens (LTSA), the Sloe power plant was brought into service for 4,896 hours between the start of the year and the end of September 2020. The service factor amounted to some 70%, more than 6 percentage points higher than the average calculated for the last two years for the same period (59.2% in 2018 and 68.4% in 2019).

Sloe Centrale BV continues to develop its CSR programme and improve the working conditions of its employees, as well as aligning with the Group's mobility programme and investigating new technological solutions to lower its carbon footprint, thus remaining an active player in energy transition.

Germany

EDF has had operations in Germany for over 25 years. With some 4,200 employees and more than 100 researchers, EDF group has a large number of activities in Germany, in particular in renewable energy, energy services, and innovation. EDF offers sustainable business models and innovative energy solutions, calling on the expertise and knowhow of EDF group and its subsidiaries.

EDF supports and contributes to energy transition in Germany, which draws extensively on renewable energy, energy efficiency, smart energy systems, and other innovative energy solutions.

EDF group entities operating in Germany

- EDF Deutschland GmbH, a wholly-owned subsidiary of EDF International SAS based in Berlin, is in charge of the Group's activities in Germany. It focuses on the promotion and development of the Group's business, in particular new business models for energy and innovative solutions to support energy transition in Germany (*Energiewende*). EDF Deutschland also represents the Group in leading German political and economic circles.
- In 2020 Hynamics, a new subsidiary in the Group in charge of putting forward an effective low-carbon hydrogen offering for industry and mobility, set up its German subsidiary, Hynamics Deutschland GmbH. This is part of a consortium of ten partners contributing to the "Reallabor Westküste 100" project. This consists in creating a regional industrial ecosystem in northern Germany focusing on hydrogen production from renewable energy, notably using the installation of a 30MW electrolyser for the Heide refinery [(1)]. The partners are studying the possibility of installing additional electrolyser capacity in this region within the next 5 years, aiming at the symbolic figure of 700MW.
- Including the installed capacity of Futuren in Germany, EDF Renewables had 187MW of gross installed wind power capacity at 31 December 2020, and operated 400MW of onshore wind power capacity.
- EDF Distributed Solutions is an EDF storage offering for industrial clients, deployed only in Germany and based on the peak-shaving model. This EDF Renewables subsidiary owns and operates 400kW of electricity storage systems, divided between two industrial sites.
- EDF group owns 100% of the share capital of the German company Energy2market (e2m), specialising in the aggregation of renewable production and local flexibility (see section 1.4.6.1.4 "EDF group's other service activities").
- Based in Erlangen (Bavaria), Framatome Gmbh has 3,400 employees, making Framatome's subsidiary the second largest engineering concern in the world. Its main business is maintaining, prolonging and upgrading nuclear plants all over the world (especially Instrumentation & Control systems). It is also involved in the building of EPRs in France, Finland, China and the UK. Framatome is also active in electricity and hydrogen storage in Germany. Framatome's other German subsidiary, Advanced Nuclear Fuels GmbH (ANF), makes fuel assemblies for PWRs (pressurised water reactors) and BWRs (boiling water reactors) in Germany and Western Europe and has 430 employees in Lingen (head office) and Karlstein.
- Metroscope also operates in Germany, which is at the heart of its development strategy. This subsidiary of EDF Pulse Croissance develops AI for industrial asset MOC. Based in Berlin, Metroscope seeks to improve the performance of German electricity generation plants.
- Since July 2020, Urbanomy has been deploying specific resources for its development in Germany, working out of EDF Deutschland GmbH's premises in Berlin. Urbanomy offers consultancy in urban & energy planning using virtualisation and decision support solutions.
- EDF Trading actively participates on commodities market in Germany, especially the intraday and gas markets.

(1) See the EDF press release dated 5 August 2020 "Green light for green hydrogen. The German Federal Ministry of the Economy approves the funding of the Westküste100 project".

- EIFER, a research centre which reports to EDF's R&D Department, is based in Karlsruhe and has more than 110 employees. Its work focuses on the optimisation of energy resources and decentralised generation (integration of renewables), energy in cities and local communities as well as energy conservation and the environment (electro-mobility, Power-to-Gas, Smart Cities). This institution is owned 50%-50% by EDF and Karlsruher Institut für Energie (KIT).

Investments

- EDF Deutschland holds a 33.3% stake in Hypion GmbH, a company that originates and develops hydrogen-related projects in the north of Germany.
- EDF Deutschland has a 18.94% stake in Ubitricity, a Berlin-based startup offering a lamp-pole-mounted charging solution for electric vehicles.
- Electranova Capital holds a stake of 13.4% in Sunfire, a Dresden-based company which develops high-temperature electrolysers (Power-to-Gas and Power-to-Liquids).
- EDF Pulse Croissance has a 14.14% stake in McPhy, manufacturer and integrator of hydrogen-based energy storage equipment.
- The Group owns 50% of a run-of-river hydropower plant located in Iffezheim on the Rhine River (148MW, 5 turbines). Extension work on this plant was completed in 2013.
- EDF group also has storage for natural gas in salt cavities located in Etzel in Lower Saxony. The aboveground facilities are operated through a 50/50 joint venture with EnBW (see section 1.4.6.2.2 "Gas assets and projects"). Via its subsidiary EDF Gas Deutschland, EDF also holds a 16% stake in BEP gas pipeline (Bunde-Etzel-Pipelinegesellschaft).

1.4.5.3.2 Central and Eastern Europe

Russia

EDF group has operations in Russia in energy services through the Dalkia subsidiary Dalkia Rus (see section 1.4.6.1.1 "Dalkia") and through its Moscow-based representation office EDF Russia, which reports to the International Division and is in charge of the promotion and development of the Group's business and new activities in energy transition in Russia and the CIS.

1.4.5.3.3 Southern Europe

Spain

At 31 December 2020, EDF International SAS held 31.48% of the share capital of Elcogas, a company owing a 320MW ICCG (Integrated Combined-Cycle Gasification) power plant, alongside Endesa Generación (40.99%), Iberdrola Generación (12.0%), and EDP (8.54%). As the profitability of the power plant was no longer assured, it was disconnected from the network in 2016 and its dismantling was initiated. In 2017, Elcogas agreed to sell land and facilities to Ence, a pulp manufacturer. The Shareholders' Meeting on 13 May 2019 resolved to dissolve the company and place it in liquidation.

The Group is also present on the Spanish market through Fenice's local subsidiary (EDF Fenice Ibérica, see section 1.4.5.2 "Italy") and Citelum (see section 1.4.6.1.2 "Citelum").

EDF Trading operates in this market from its trading platform in London (see section 1.4.6.3 "Optimisation and trading: EDF Trading").

Framatome Spain is active in Spain through various engineering and maintenance contracts with firms that own nuclear reactors.

Since 2015, EDF Invest has held a minority stake in Madrileña Red de Gas, the operator of the main gas distribution network in the Madrid region.

EDF also operates through its Madrid-based representation office EDF Peninsula Iberica, which reports to the International Division and is in charge of the promotion and development of the Group's business and new activities in energy transition in Spain and Portugal.

1.4.5.3.4 North America

The EDF group operates throughout the North American continent, with a strong presence in the United States.

It has more than 9.51GW of gross installed capacity in North America. It also manages, on behalf of third parties, around 40.5GW of installed capacity under operation and maintenance or optimisation services contracts.

EDF's activities in North America mainly include:

- investments in nuclear generation, related to its 49.99% stake in CENG ("Constellation Energy Nuclear Group"), a joint venture with the Exelon Corporation (leading American nuclear operator) in three nuclear power plants. CENG has installed capacity of 4GW (*i.e.* 2GW consolidated by EDF group). Exelon is the licensed operator of these three facilities;
- renewable energies, with a gross installed and under construction capacity of 7.1GW, mainly located in the United States through EDF Renewables North America, a wholly-owned American subsidiary of EDF Renewables. Equally, EDF Renewables Services (a wholly-owned subsidiary of EDF Renewables North America) manages close to 12.9GW in North America through operation and maintenance contracts on its own account or on behalf of third parties;
- trading throughout the entire value chain in North American gas and electricity markets through EDF Trading North America, and the supply of energy management products in the US and Canada through EDF Energy Services (a wholly-owned subsidiary of EDF Trading North America);
- energy services, local management of energy and energy efficiency, and public lighting under the management of Dalkia and its subsidiaries Dalkia Energy Solutions (formerly Groom Energy Solutions) and Aegis Energy Services;
- R&D and Innovation, as part of EDF Innovation Lab.

1.4.5.3.4.1 Nuclear activities in the United States

Nuclear generation: Constellation Energy Nuclear Group (CENG)

On 6 November 2009, the EDF group and CEG established CENG. Since the merger between Exelon and CEG, EDF and Exelon respectively hold 49.99% and 50.01% of CENG. EDF and Exelon signed an agreement in 2014 to transfer the operating licenses for the CENG power plants to Exelon, under which Exelon manages the operational activities of the three CENG nuclear sites (5 reactors).

As part of the agreement, CENG paid EDF $400 million in exceptional dividends and EDF obtained an option to sell its CENG shares to Exelon between 1 January 2016 and 30 June 2022. On 20 November 2019, EDF initiated the put procedure by notifying Exelon of its intention to the exercise of the put option [(1)]. The disposal price of the shares will be based on a determination of their fair value, pursuant to the contractual provisions in the put option agreement. Completion of the transaction is subject to obtaining the necessary regulatory approval from the New York Public Service Commission (NY PSC). The Federal Energy Regulation Commission (FERC) approved the transaction on 30 July 2020.

CENG's governance is provided by a Board of Directors composed of ten members, five of whom are appointed by the EDF group and five others, including the President, by Exelon.

CENG's nuclear activities

CENG's nuclear business is under the regulatory jurisdiction of the US Nuclear Regulatory Commission (NRC).

CENG operates five nuclear reactors, spread across three operating sites and representing a combined capacity of 4,272MW. The duration of licences for Units 1 and 2 of Calvert Cliffs, Unit 1 and 2 of Nine Mile Point and RE Ginna is 60 years.

(1) See EDF's press release dated 20 November 2019 "EDF notifies the exercise of its put option on its participation in CENG".

Reactors	Capacity *(in MW)*	% interest	Company-owned capacity *(in MW)*	Output [2] *(in TWh)* 2020	2019
Calvert Cliffs 1	908	100	908	7.37	7.91
Calvert Cliffs 2	881	100	881	7.71	7.10
Nine Mile Point 1	620	100	620	5.47	4.57
Nine Mile Point 2 [1]	1,287	82	1,056	8.34	9.16
RE Ginna	576	100	576	4.33	4.99
TOTAL	**4,272**		**4,041**	**33.22**	**33.74**

(1) CENG owns 82% of this unit (i.e. 1,056MW of the unit's total capacity of 1,287MW). The 18% of Unit 2 of Nine Mile Point not owned by CENG belongs to the Long Island Power Authority (LIPA). LIPA receives 18% of the capacity and electricity generated by Nine Mile Point Unit 2, in consideration for payment to CENG of its share of the costs incurred by the unit, and is responsible for its 18% share of the costs of dismantling the unit. CENG and LIPA are each required to provide specific funding for Nine Mile Point 2.

(2) These values correspond to the sum of the exact values expressed to one decimal place after rounding.

The principal competitors of CENG on this market are Entergy, AEP, Exelon, Dynegy and NRG.

Regulations of the State of New York

On 1 August 2016, the New York Public Service Commission ("NYPSC") issued an order establishing the New York Clean Energy Standard, a component of which is a Zero Emission Credit ("ZEC") programme targeted at preserving the environmental attributes of zero-emissions nuclear-powered generating facilities that meet the criteria demonstrating public necessity as determined by the NYPSC to include CENG's Ginna, and Nine Mile Point nuclear facilities.

On 30 November 2016 (as amended on 13 January 2017), a group of parties filed a Petition in New York State court seeking to invalidate the ZEC program, which argued that the NYPSC did not have authority to establish the program, that it violated state environmental law and that it violated certain technical provisions of the State Administrative Procedures Act when adopting the ZEC program. On 22 January 2018, the court dismissed the environmental claims and the majority of the plaintiffs from the case but denied the motions to dismiss with respect to the remaining five plaintiffs and claims, without commenting on the merits of the case.

On 8 October 2019, the court dismissed all remaining claims. The petitioners filed a notice of appeal on 4 November 2019 and originally had until 4 May 2020 to file their brief. Due to Covid-19 related restrictions, the court extended the deadline to 29 July 2020. Petitioners did not file a brief by the deadline, so the case is deemed dismissed. Petitioners are permitted up to one year from 29 July 2020 to file a motion to vacate the dismissal if they can show good cause for the delay.

1.4.5.3.4.2 Other activities in North America

See section 1.4.6.3 "Optimization and trading: EDF Trading".

See section 1.4.1.3.3 "The activity of EDF Renewables".

See section 1.4.6.1.1 "Dalkia".

For research and development, see section 1.5.1.4 "EDF R&D partnerships".

Citelum, an EDF subsidiary in the field of urban road and other public lighting, commenced the wind up and dissolution of its United States operations. As part of this process, effective 6 August 2020, Citelum transferred the assets of its business in Albuquerque, New Mexico to Dalkia Energy Solutions.

Operating in nuclear energy in the United States since the 1950s, Framatome holds a large share of the market, involved in providing power to some 36 million American households. Its mission consists in ensuring the maintenance and modernisation of the American nuclear plants in operation and providing it with the fuel required and supporting the potential construction of new plants (also see section 1.4.1.1.4 "Activities related to nuclear generation: Framatome").

1.4.5.3.5 South America

In South America, the EDF group is present in the Brazilian and Chilean markets, and is extending its ambitions in certain countries in the region, in which it is prospecting for development opportunities.

1.4.5.3.5.1 Brazil

Since April 2014, the Group has held 100% of EDF Norte Fluminense SA (EDF NF). EDF NF built and has operated, since the end of 2004, the Combined-Cycle Gas plant of Norte Fluminense, with installed capacity of 826MW, located in the region of Macaé, State of Rio de Janeiro. A 20-year Power Purchase Agreement (PPA) for 725MW is in place with Light, the distribution company for the city of Rio de Janeiro. EDF NF supplies the equivalent of almost 25% (2,5 million of clients) of the electricity energy consumed in the Rio de Janeiro metropolitan area. The power plant's generation in 2020 is 4.9TWh which represents a decrease of 17% comparing with year end 2019. When Brazil's market conditions and electricity grid permit, the remaining balance is sold on the spot market.

In addition, on 11 December 2014, through its subsidiary EDF Norte Fluminense, EDF acquired a 51% stake in Sinop Energia, responsible for building, maintaining and operating the Sinop hydropower plant with an installed capacity of 402MW, supplying the equivalent of 50% of the State of Mato Grosso (1,6 million clients). The commercial commissioning was authorized by ANEEL (Brazil Regulatory Agency) on 17 September 2019 for the first turbine and 18 October 2019 for the second turbine.

Since the reservoir was impounded, several fish mortality events have been observed downstream of the dam. They have been the subject of in-depth studies by two groups of independent experts in France and Brazil, who have concluded, among other things, that (i) the water quality in the reservoir is not to blame, (ii) this phenomenon does not occur during normal operation of the plant but is essentially linked to the use of the spillways, which in particular generate gaseous supersaturation phenomena. This phenomenon is rare but occurs on other sites around the world, including in Brazil. The expert groups made several recommendations that are currently being implemented, such as the operating procedures for spillways and the implementation of devices to keep fish away from spillways and other risk areas.

In the first quarter of 2018, EDF NF won the call for tenders as the contractor to operate and maintain the Sinop Energia plant. These O&M activities will be remotely performed from Macaé (2,500km away from Sinop), starting from the end of 2021, thanks to innovative technologies being implemented by EDF NF.

In line with the CAP 2030 strategic plan, the EDF Renewables subsidiary is accelerating its development in Latin America and notably in Brazil with a portfolio of:

- 398.5MW of solar energy from Pirapora power plant (one of the largest solar power plant of South America located at Minas Gerais State);
- 329MW of wind energy in operation and 379MW under construction in the state of Bahia.

EDF is also present in Brazil *via*:

- Edison, of which the 50%-held subsidiary Ibiritermo operates a CCGT of 226MW in the state of Minas Gerais;
- Citelum, reference company in municipal public lighting and management and connected public service. In 2020, Citelum in Brazil renewed its contracts in Imperatriz, Salvador de Bahia and Macapá and won the LED lighting renovation contracts for the cities of Marilia and Jandira.

1.4.5.3.5.2 Chile

Since 2013, EDF was jointly developing with its Chilean partner Andes Mining & Energy (AME) a gas to power project combining the design, construction, and operation of a CCGT-type power plant with a power output of around 600MW, a storage infrastructure and an LNG Floating Storage Regasification Unit (FSRU). *Via* its subsidiary EDF Chile, created in 2014 for this purpose, the Group has a 50% shareholding in the two project companies (GNL Penco and Central El Campesino – which was renamed GM Holdings), alongside BiobioGenera (50%) of which AME is the controlling shareholder.

The project nonetheless suffered a setback when the Chilean Supreme Court, in a decision on 30 January 2017, revoked the permit for the Penco Lirquen regasification terminal. Various measures have been taken to further the Group's expansion into electricity generation in Chile, including resuming the process to obtain a permit, which was finally granted in November 2019.

In addition, Central El Campesino (now GM Holdings) acquired in May 2018 ESSA, owner of a 750MW thermal generation asset.

The Group is also prospecting for development opportunities and working on the predevelopment phase of power generation assets, especially from photovoltaic and hydraulic sources.

EDF Renewables is also active in Chile *via* the Bolero solar plant (146MWp) in the Atacama Desert, the Santiago Solar photovoltaic project (115MWp) which is jointly held with AME and opened in January 2018, and the Cabo Leones 1 wind farms (115MW) which came online in June 2018. Currently, Cabo Leones 1 is undergoing a 60MW capacity expansion.

Finally, Citelum, a wholly-owned subsidiary of the EDF group, is also present in the country, in the public lighting market (see section 1.4.6.1.2 "Citelum"). In 2020, Citelum installed 572 solar-powered lighting fixtures in Estación Central (province of Santiago) to enable the city to make substantial energy savings and significantly reduce its CO_2 emissions. This new generation of lighting can also be programmed to modulate light intensity according to the time of day and the number of visitors.

1.4.5.3.5.3 Peru

Since 2018, the Group is present in Peru *via* its subsidiary EDF Peru SAC which is prospecting for development opportunities and working on the predevelopment phase of power generation assets.

1.4.5.3.6 Asia-Pacific

The EDF group's activities in the Asia-Pacific region are focused on China and fast developing countries. The presence in the sectors of electricity generation, networks and services constitutes an industrial challenge for the Group. In nuclear power, in addition to the EPR project in Taishan, new projects should provide the Group with access to technological innovation and enable it to exploit its industrial expertise.

EDF's objective is, thus, to maintain its competitive and technological advantages in the international arena focused on the global nuclear programme, the equipping of emerging countries, and the perspective of the French fleet renewal.

1.4.5.3.6.1 China

EDF group has had operations in China for over 35 years, and is now one of the largest foreign investors in electricity generation, with around 3,600MW of net installed capacity [(1)], in particular *via* stakes in the Taishan EPR power plant, the Dongtai IV and V offshore wind farms, and coal-fired thermal power plants. 48% of electricity from EDF's output in China was CO_2-free in 2020, higher than the Chinese national average. The EDF group has been developing partnerships with leading Chinese electric energy companies, which open up new prospects for investment in the nuclear industry, renewable energies, energy services and engineering.

The Covid-19 crisis had a negative impact on the electricity demand in China in the first half of 2020, resulting in a fall in revenues for production plants. This phenomenon was only partially offset by the strong recovery of the market in the second half. The pandemic also had an impact on the development of certain projects due to travel restrictions in China and internationally.

Nuclear power generation activities

Daya Bay, Ling Ao and Taishan EPR power plants

After having led the design, construction and commissioning in 1994 of Daya Bay (two nuclear reactors of 1,000MW each) and then assisted the Chinese group China General Nuclear Power Co. (CGN) in the construction of the Ling Ao Phase 1 power plant (two reactors of 1,000MW commissioned in 2002 and 2003), followed by Phase 2 (two additional reactors of 1,000MW commissioned in 2010 and 2011), EDF is currently providing assistance to the CGN group with the operation of its entire fleet. The performance recorded by these plants since they were commissioned is one of the Group's main references in China, bearing witness to the cooperation between France and China.

Now an investor, EDF owns a 30% shareholding in Taishan Nuclear Power Joint Venture Company Ltd., which was set up to fund, build and operate two EPR nuclear reactors in Taishan (1,750MW each), in the province of Guangdong. Through this project, the Group represents the first foreign investor in Chinese nuclear power generation. The project's success will rest on the complementary expertise of the EDF (including Framatome) and CGN groups.

Unit 1 came into commercial operation on 13 December 2018, and Unit 2 on 7 September 2019.

See also sections 1.4.1.1.3.2 "Other "New Nuclear" projects" and 2.2.4 "operational performance – risk factor 4A "Management of large and complex industrial projects, including EPR projects".

Partnership agreements

EDF is developing partnerships with key players in the Chinese nuclear industry, in particular its peers CGN and CNNC, to the benefit of the Group's business lines. The General Partnership Agreement between EDF and CGN was signed in 2007 and complemented in 2014 by implementation of agreements related to engineering, providers, R&D, and plant operation-maintenance. The partnership with CGN enabled the initiation of discussions concerning its participation in joint nuclear projects in Great Britain, which resulted in the signature by EDF and CGN of the final contracts for the Hinkley Point C power plant on 29 September 2016. An agreement covering the development of the UK Hualong technology was also signed at that time.

The EDF group has set up a facility based in Beijing and Shenzhen (the Group's front office for China's nuclear industry) with the aim of promoting the EDF model of an integrated architect-assembler operator while acting as a flagship for French industry and positioning itself to support the Group's projects, in partnership with the Chinese nuclear sector. Experts in this facility are working, in particular, to further promote French codes and standards, as well as the Group's nuclear safety guidelines. They are also a source of technical exchanges benefiting EDF group's nuclear activities. EDF also chairs the Partenariat France Chine Électricité (PFCE), made up of qualified suppliers of EDF which are seeking to develop in China.

In 2010, the Group also concluded a partnership framework agreement with China National Nuclear Corporation (CNNC), extended in March 2014 and renewed in 2019, aimed at developing their cooperation along deeper, global lines. Lastly, in the context of the Franco-Chinese governmental declaration of June 2015, tripartite agreements (EDF and AREVA – Framatome with CGN and CNNC) were signed in 2015, providing for, *inter alia*, the participation of the Chinese industrial customers in Great Britain, as well as a partnership for the development of medium- and large-sized reactors.

In addition, an agreement between AFCEN [(2)] and NEA (National Energy Administration) covering cooperation as regards codes and standards was signed in November 2017. Its objective is to promote mutual recognition of nuclear codes and standards and to establish a basis for cooperation between France and China enabling both countries to operate on the international nuclear market.

(1) Share in the capacity corresponding to EDF's stake.

(2) French Association for the Design, Construction and Operating Supervision of the Equipment for Electronuclear Boilers.

The action plan for Franco-Chinese relations backed by the French and Chinese Presidents in November 2019 acclaims the cooperation between French and Chinese industrial groups on the EPR, in particular in Taishan, and calls for ongoing cooperation in China and on third-country markets, as well as continuation of the joint work on projects in the UK (Hinkley Point C, Sizewell, and Bradwell B). See section 1.4.5.1.2.5 "Nuclear New Build business" in 1.4.5.1 "United Kingdom".

Framatome

Framatome, specialising in nuclear steam supply systems, the supply of instrumentation & control systems, equipment, installed base services, and fuel, all provided with high levels of performance and safety, has been operating in China for more than 35 years. Framatome China draws on local skills and teams as well as on its own international experts, engineers, and technicians to address the needs of its customers.

Units 1 and 2 of the Taishan power plants, designed by Framatome, are now in commercial operation; Unit 1 has just completed its very first unit shutdown.

Framatome is taking part in the assembly and installation of the Tokamak (TAC1) at ITER's nuclear fusion project centre, and is also supplying some equipment and technology building blocks for the Hualong project (RCP, I&C, etc.) along with the fuel.

Framatome operates in China *via* joint ventures with Dongfang Electric Corporation (FDJV) and China National Nuclear Corporation (CAST) and through its wholly-owned subsidiary Framatome Nuclear Services (FNS). Framatome operates on 9 sites: Shanghai, Lianyungang, Songjiang, Haiyan, Deyang, Shenzhen, Daya Bay, and Taishan, with a representation office in Beijing.

Coal-fired thermal power generation activities

Shandong Zhonghua Power Company Ltd. (SZPC)

The EDF group holds 19.6% of SZPC, a company which owns three power plants in the Shandong province, commissioned between 1987 and 2004, with a total capacity of 3,060MW. The other shareholders are the Guodian group (which merged with Shenhua in 2017 to form a new group, China Energy Investment Group) and the Hong Kong electricity producer CLP.

Datang Sanmenxia Power Generation Company Ltd. (DSPC)

The EDF group holds 35% of DSPC, the company that owns the Sanmenxia 2 power plant in Henan province, commissioned in 2007, with an installed capacity of 2×600MW, using a technology known as "supercritical coal". This investment was made through a joint venture with a fixed lifespan, established by the Chinese authorities, running until 2039. The other shareholders are two Chinese companies, including the Datang Group, which has a majority stake in DSPC.

Fuzhou Power Generation Company (FZPC)

The EDF group holds 49% of FZPC, a joint venture created in 2014 with a subsidiary of the Datang group to build and operate an "ultra-supercritical" power plant (2×1,000MW) in the Jiangxi province. The first unit was commissioned in December 2015, the second in April 2016. Fuzhou is thus the first power plant of the "ultra-supercritical" type (in other words, having increased output and a limited environmental impact) in which the EDF group has a stake. This technology makes it possible to reach high levels of temperature and pressure in the boiler, assuring a better output (close to 44% for Fuzhou) than a traditional power plant, while decreasing coal consumption and CO_2 per kilowatt-hour generated.

Renewable energy

Through the Chinese subsidiary of EDF Renewables, EDF group has a stake in 6 wind farms in operation, with gross total installed power of 267.3MW (121.4MW net), a stake in 2 wind farms under construction, with gross total installed power of 136MW (107MW net) and a pipeline of projects under development totalling several hundred MW. In 2018, EDF Renewables diversified its business into distributed solar power with the creation of a joint venture with ACC, aimed at developing rooftop solar power solutions for industrial customers (126MW is in operation or under construction to date, including 121MW net, plus a portfolio of projects totalling around 30MW). EDF Renewables also set up a joint venture with Qilu Transportation to install ground-mounted solar panels along highways operated by Qilu in Shandong province.

In the sphere of offshore wind power, on the occasion of the official visit of the Chinese President to France in March 2019, EDF concluded an agreement with the China Energy Investment electricity company for the construction of two projects (Dongtai IV and Dongtai V) off the shore of Jiangsu province. The financial closing of the joint venture agreements took place in May 2020 [(1)]. The two partners are building and operating these wind farms, with total capacity of 502MW, together. The first phase (Dongtai IV – 302MW) was commissioned in December 2019; the second phase (Dongtai V – 200MW) will be commissioned in 2021 (see section 1.4.1.3.3 "EDF Renewables activities").

Research & Development (R&D) activities

In line with EDF's strategic plan in China, R&D centre has stepped up support to EDF China's Divisions and is deploying its expertise on priority thematic areas for EDF's development in China. The centre's activities involve the generation and storage of low-carbon electricity, innovative electricity grids, local multi-energy systems, energy engineering, electric mobility and open innovation. Benefiting from the highly dynamic and innovative Chinese ecosystem, EDF's R&D centre in China is working on applications of digital technology and artificial intelligence to energy business lines.

Energy services

In the city of Sanmenxia (Henan province), EDF set up a joint venture (of which 65% is held by EDF) for the construction and operation of an urban heating network using the recovery of waste heat emitted by thermal power plants of its partner Datang. The concession agreement, for a period of 30 years, was signed on 9 August 2016 and the network entered into commercial operation on 15 November 2016. After the success of the first heating season, the municipality of Sanmenxia decided on 29 August 2017 to extend the concession area granted to the joint venture and to reduce CO_2 emissions by 200,000 to 240,000 tonnes per year starting from 2021. In 2020, EDF added geothermal energy to certain sections of the heating network.

In the city of Lingbao (Henan province), EDF set up on 13 November 2017 a joint venture (of which 65% is held by EDF) with the municipal investment company to build and operate a heating network powered by a 35MW biomass cogeneration power plant. The 30-year concession agreement was subscript on 9 January 2018 as part of the French President's state visit to China. This project aims to provide additional income to local farmers and to allow for the controlled elimination of agricultural waste and the avoidance of 150,000 tonnes of CO_2 per year. The cogeneration power plant supplied heat for its first heating season in November 2020.

In the city of Sanya (Hainan province), EDF and its partner Changfeng Energy were chosen on 8 August 2017 by the municipal government to complete a network of multi-energy plants in the city's tourist areas under a 30-year concession agreement. This initiative will make it possible to supply cooling (air conditioning) and sanitary hot water to hotels, shopping centres and hospitals. The joint venture (of which 30% is held by EDF) was set up on 6 November 2017 and the concession agreement was signed on 9 January 2018 in the presence of the French and Chinese Presidents. The first cold production plant is due to commence commercial operations in 2021. This project should enable the avoidance of 20,000 to 70,000 tonnes of CO_2 per year.

In November 2019, EDF and Huadian concluded an agreement to create a joint venture (of which 49% is held by EDF) for the operation of an existing heat network in the centre of Wuhan city. Powered by waste heat from a CCGT in Huadian, the network will benefit from digital tools installed by EDF at Sanmenxia.

In partnership with car manufacturer Beijing Automotive Group (BAIC), EDF inaugurated a first battery exchange station for a fleet of taxis for the City of Sanya (Hainan Province) in August 2020.

The Group also provides innovative solutions for industry and eco-neighbourhoods, drawing on EDF's skills in Europe, in particular in the field of smart grids, cogeneration, waste heat recovery, decentralised renewable energy (heat pumps, urban solar heating, biomass, and geothermal energy) and digital tools developed on site with the China R&D centre.

Other EDF group activities in China

Citelum subsidiary is also present in this country for public lighting, through the contract signed with Kunming city (113,000 street lights).

(1) See the EDF Renewables press release dated 2 June 2020 "EDF group and CEI Group: partnering to build and operate offshore wind power projects in the South China Sea".

1.4.5.3.6.2 Southeast and Southern Asia

The EDF group's activities in Southeast and Southern Asia are focused on the development of the electricity sector, particularly through projects for the design, construction and operation of new thermal gas and hydraulic generation plants in countries offering Independent Power Plant (IPP) type opportunities, as well as in the field of renewable energies, nuclear, smart cities, microgrids and innovation.

Vietnam

At 31 December 2020, EDF owned 56.25% of Mekong Energy Company Ltd. (MECO), the company owning Phu My 2.2, a combined cycle gas power plant with a capacity of 715MW. The other shareholders are TEPCO (JERA) and SGM2 (Sumitomo). This is the first IPP project financed exclusively by foreign investors in Vietnam. The BOT (Build, Operate, Transfer) contract has a term of 20 years. In 2005, EDF provided "turnkey" delivery of the power plant, and operations are now managed by MECO.

Once built, the high-efficiency and environmentally-optimised CCGT Son My1 plant with a capacity of 2,250MW in Binh Thuan province, situated north-east of Saigon will be operated for a period of 20 years. It forms part of Vietnam's efforts to diversify its sources of energy and will help satisfy the country's growing hunger for electricity while reducing the share of coal in its energy mix in favour of gas and renewable energy. The EDF group was chosen to head the consortium tasked with studying the project alongside local partner Pacific Corporation and Japanese partners Sojitz Corporation and Kyushu Electric Power Co. with stakes of 37.5%, 25%, 18.75% and 18.75% respectively. A memorandum of understanding setting out the general terms of the project was signed with Vietnam's Ministry of Industry and Trade (MOIT) on 2 November 2018. The working schedule for 2021 will consist in obtaining final approval for this feasibility study from MOIT and moving forward in the negotiation of a concession agreement and other contractual documents required for commissioning of the first unit by the end of 2025.

Laos

At 31 December 2020, the EDF group held, *via* EDF Invest, a 40% stake in Nam Theun 2 Power Company (NTPC), which owns the hydropower complex Nam Theun 2 with an installed capacity of 1,070MW, built by the EDF group under a "turnkey" contract, commissioned in 2010. The other shareholders are a Thai company, EGCO (Electricity Generating Public Company Limited), which holds 35%, and a Lao State company, LHSE (Lao Holding State Enterprise), which holds 25%. NTPC operates the power plant on a 25-year concession agreement concluded with the government of Laos.

2020 business focused on the operational management of installations (first major overhaul since commissioning), in a difficult hydrological year in Laos, whilst also continuing with social and environmental support missions in the region of Nam Theun (the Nakai Nam Theun National Park was accepted as candidate to the International Union for the Conservation of Nature's Green List of Protected and Conserved Areas).

A project to develop a floating solar wind farm with a capacity of 240MWp on the Nam Theun 2 hydroelectric dam was launched in 2019 and formalised by the signature of a Memorandum of Understanding with the Lao government in July 2019 and then with our partners in June 2020. This project forms part of the Lao government's strategy to diversify its energy mix.

India

In the field of nuclear energy, for details of the cooperation agreement for the project to construct six EPR reactors in Jaitapur, see section 1.4.1.1.3.2 "Other New Nuclear projects".

EDF continued developing its smart meters and smart grid business. After winning a contract in 2016 to supply 75,000 smart meters to the New Delhi Municipality Council, in the fall of 2018 the Group won a call for tenders issued by Energy Efficient Services Limited (EESL), an Indian energy services company (ESCO), to install nearly 5 million smart meters in five Indian states, under the French-Indian Cooperation Plan. The EESL3 project was officially launched on 14 March 2019. The test phase and the implementation of the integrated IT infrastructure were completed in 2020; the massive deployment phase is underway. The EDF International Networks subsidiary, established in India since 2019, is coordinating the implementation of the project.

The first edition of EDF Pulse was launched in Asia, targeting young Indian companies for its first edition, and was very successful, attracting a large number of entries. The awards ceremony with the grand jury was held in November 2020, with awards going to the most promising entries in the three challenges: sustainable smart lifestyles, resilient smart infrastructures, and electric mobility infrastructures.

EDF Renewables continued growing its solar and wind power businesses in India, the latter established in 2016 (see section 1.4.1.3.3 "EDF Renewables activities").

The Citelum subsidiary also has operations in India, where it manages a network of lights in the City of Ahmedabad, with which it has renewed its street lighting works and maintenance contract for 5 years. Citelum signed a service contract with EDF IN for the installation of 500,000 smart meters and for the maintenance of 2,500,000 meters for a 7-year period. The subsidiary also won the contract for the installation and maintenance of equipment supplier Suveg Electronics' street lighting control equipment, covering 14,200 lights.

Myanmar [1]

The Shweli 3 project to develop a hydroelectric dam on the river Shweli in Shan state, North-East Myanmar, achieved further milestones in 2020. The project relates to the construction and 20-year operation of a 671MW hydroelectric dam. The EDF group has been appointed lead contractor of the consortium (with a 32.5% stake), responsible for developing the project alongside two private-sector partners, one from Myanmar (Birman Ayeyar Hinthar Holdings Co. Ltd., 10%) plus a Japanese partner (Marubeni Corporation, 32.5%), together with the Ministry of Electricity and Energy (MOEE, 25%), a Burmese state entity.

The dam is subject to the same strict standards observed by the Group in all its projects in terms of corporate and environmental responsibility. It will supply responsibly-sourced, low-carbon electricity to a country in dire need of power for economic development where nearly 50% of the population currently has no access to electricity.

In addition, EDF is pursuing its development in the field of microgrids in Myanmar, aimed at the development of hybrid microgrids (solar and battery) in several remote villages. In 2020, a pilot was constructed and operationalised in the Magway Region (Myanmar), in collaboration with our partners InfraCo Asie and Solarisesys. See also section 3.6.9 "Summary of EDF group's vigilance plan".

Indonesia

The EDF group is continuing its development strategy in Indonesia, favouring renewable energy projects and accelerating access to electricity for the country's remotest island locations, with the development of microgrids.

Research & Development

Following an agreement signed in June 2013 with the Singapore Housing and Development Board, the city's largest construction firm, with the aim of developing an innovative urban modelling tool, the EDF group, in 2014, opened a centre of excellence for sustainable cities in Asia: EDF Lab Singapore Pte. Ltd. This R&D centre dedicated to urban planning has as its mission to reinforce existing collaboration and to initiate new collaborative relationships with Singapore and other cities of the region.

In October 2018, Nanyang Technical University, EDF, and Enedis inaugurated the Microgrid for Affordable and Sustainable Electricity in Remote Areas (MASERA) demonstrator as part of Singapore International Energy Week (SIEW) and the France-Singapore Year of Innovation 2018. The operationalisation of the demonstrator in 2019 and robust related experience enabled the Lab to sign its first service contracts in 2020. The Group is now well-established in Singapore to better manage its interests in Southeast Asia, strengthen its synergies with the R&D lab, and embed itself in the development and innovation ecosystem of smart cities, particularly vibrant in Singapore. The EDF team had its first success in May 2020, when along with two other providers, it was awarded a service contract for technical, commercial, and legal consultancy for an electricity importation project by the EMA (Energy Management Authority). This initial success opens up the way for further opportunities in Singapore.

(1) EDF is paying close attention to political developments in the wake of the coup on 1 February 2021, and may review its projects currently under development in Myanmar.

1.4.5.3.7 Africa

The Group wishes to develop on the African continent by assisting countries with high-energy demand, on a selective basis appropriate to each geographic region, and by building sustainable and multi-industry partnerships. EDF is also intensifying its action in the supply of competitive off-grid energy.

South Africa

EDF group has had operations in South Africa since 1978 with the construction of the Koeberg nuclear power plant, and has since been assisting national electricity supplier ESKOM with the operation and maintenance of this power plant under a multi-year technical assistance contract, renewed with the Nuclear Generation Division in 2015. Framatome is also a major supplier to ESKOM (general maintenance and fuel). In 2014, a contract was signed to change the power plant's steam generators: this is due to take place in 2021 and 2022.

The EDF group established a subsidiary (EDF Development South Africa) in 2007 in Johannesburg, with a view to preparing the relaunching of the South African nuclear programme. The South African subsidiary is also responsible for developing EDF's business activities in Southern Africa, particularly as regards generation projects as well as the sale of services relating to thermal engineering, hydropower, transmission and distribution. In December 2018, EDF purchased 30% of South African engineering company GIBB Power to support the development of its engineering activity in the Southern Africa Region and meet the positive discrimination criteria in force in South Africa.

EDF group's renewables activities in the country began in 2011 with the acquisition of Innowind, in which the Group now has an 84% stake, allowing it to respond to renewables calls for tender issued by the South African government. 3 wind power projects were won in 2012 and one in 2015, totalling 142MW (35MW of which are currently under construction). This government programme of calls for tender was frozen between 2015 and 2019.

In October 2019, the new government promulgated an Energy Master Plan for the country (Integrated Resource Plan 2019-2030); this plans for around an additional 20GW of renewables capacity by 2030, 3GW of gas, and strategic thinking to consider the relaunch of a nuclear programme including small modular reactors (SMRs). The implementation of this master plan is underway, with the launch of a request for information (RFI) for new nuclear capacity, to which EDF group responded in October 2020. EDF Renewables (South Africa) is also preparing to respond to new renewables calls for tender announced for 2021.

The Group is also present in South Africa *via* the company KES (Kukhanya Energy Services), created in 2002 (see section 1.4.5.3.9 "Off-grid energy").

Mozambique

The Group has been active in Mozambique since the end of the 1980s involving the provision of engineering services and has formed preferred partnerships with EDM (Electricidade de Moçambique).

Morocco

The EDF group has been active in Morocco since the 1970s and has formed preferred partnerships with Morocco's national electricity and drinking water office (ONEE), electricity distribution authorities, and industrial players. To help support its development, the Group created EDF Maroc in 1997, EDF EN Maroc in 2012 as well as EDF Fenice Maroc in October 2016.

The Group and ONEE continued their cooperation, pursuant to the general agreement signed in January 2012, in the areas of renewable, thermal and hydraulic generation, as well as in networks and training.

The Group is making a major contribution to the decarbonisation of the Moroccan energy mix. After having been selected by ONEE in a call for tenders, the consortium led by EDF Renewables in partnership with Japanese group Mitsui & Co. is developing the 150MW Taza wind farm, for which the construction of phase 1 (87MW) commenced on 2 September 2020.

EDF Renewables, in a consortium with Masdar and Green of Africa, will also be carrying out the design, construction, operation, and maintenance of the first phase of the Noor Midelt solar complex following an international call for tender won in May 2019. This 800MW capacity project, located north of Midelt, is an innovative hybrid power plant combining concentrated solar power and photovoltaic solar power, a world first.

The Group also has operations in Morocco in energy efficiency activities through EDF Fenice Maroc, a subsidiary of Fenice Iberica (Edison), involved *via* a circular economy contract with a multinational group in the food industry, as well as on the street lighting market through its subsidiary Citelum Maghreb.

Senegal

The Group is also present in Senegal, through the ERA company, the operator of the rural electrification concession in Kaffrine-Tambacounda-Kédougou. In 2019, EDFI acquired the 30% stake held by Matforce in ERA, thereby becoming its sole shareholder.

A price review was engaged in 2017 to ensure the economic equilibrium of the concession. As the ruling made by the regulator in late 2019 was not satisfactory, an appeal against this ruling was lodged by ERA with Senegal's Supreme Court on 12 March 2020. EDF also confirmed to the State of Senegal that it wished to withdraw from the share capital of ERA.

Cameroon

Nachtigal Hydro Power Company (NHPC), owned by EDF (40%), IFC (20%), the Republic of Cameroon (15%), Africa50 (15%) and STOA (10%) have begun construction of the Nachtigal 420MW hydropower dam, situated on the Sanaga River, close to Yaoundé on 1 February 2019. In July 2016, Nachtigal Hydro Power Company was created to assist with the project and signed a Concession Agreement for Electricity Generation in April 2017. The Nachtigal financial closing was completed on 24 December 2018. The first loan drawdown took place in January 2019.

The Nachtigal hydroelectric power plant is a sizeable project for the country and will, on commissioning, be the most important generation resource in Cameroon. It aims at providing around one third of the electricity needs and generating numerous economic benefits for the local economy. At the end of 2020, the estimated delay resulting from the Covid-19 health crisis is 4.5 months. The electromechanical assembly schedule will aim to optimise this time as much as possible. The level of progress in civil engineering at 31 December 2020 is around 37%. Commissioning is scheduled for the beginning of 2024.

Following the MOU signed with the Government of Cameroon awarding EDF exclusive development of the Kikot hydroelectric project on the Sanaga, discussions between the Republic of Cameroon, SFI, and EDF enabled an agreement to be reached on the joint development of this project and could soon result in the signature of a JDA (Joint Development Agreement).

Republic of the Congo

EDF International Networks, a wholly-owned subsidiary of the EDF group, opened a branch in September 2017 to further develop its activities in the country in support of E2C (Énergie Électrique du Congo) [(1)].

Egypt

The two Benban 65MW solar power plants, developed on a parity basis with Egyptian company Elsewedy Electric, were commissioned in August 2019, and are delivering very satisfactory performance. The PPA is for 25 years (see also section 1.4.1.3.3 "EDF Renewables activity").

In 2019, EDF Renewables took out a strategic stake in KarmSolar, a major player on the emerging market for privately-produced and distributed solar power in Egypt. The company also operates microgrid projects that include storage. KarmSolar has a portfolio of 170MW of operational solar power plants and plants under construction or development (see also section 1.4.1.3.3 "Activities of EDF Renewables").

EDF is also assisting Egypt with its energy transition in a consultancy capacity. In the field of transmission with EETC, EDF is supervising the engineering and construction of the dispatcher in the Delta (2017 contract) and the new national dispatcher to be located in Egypt's new administrative capital (2019 contract). To support the EIB, EDF is pursuing its consultancy activity with EETC for the development of its transmission network. For EEHC, in the field of distribution, in 2020 EDF International Networks continued with the deployment of 53,000 smart meters as part of a consortium led by French manufacturer Sagemcom and including the Egyptian company Globaltronics.

Ivory Coast

EDF group is developing the "Biovéa" project for a biomass electricity power plant with two 23MW units in partnership with SIFCA, an Ivorian agro-industrial group in West Africa, and Meridiam, an investment firm which joined the project in January 2018. This project is already included in Ivory Coast's development master plan. An agreement on the transmission price for electricity was entered into with the

(1) Also called SNE.

State of Ivory Coast on 30 November 2017; the concession agreement with the State was signed on 9 December 2019. The final investment decision is scheduled to be made at the beginning of 2021.

In 2019, EDFI became a shareholder in Conergies Group, taking out a 49% stake. The Conergies Group is active in heating, ventilation, and industrial and solar refrigeration in Ivory Coast and Mali through its subsidiaries ARIC and RICA.

In August 2016, the Group created a local subsidiary to support its development strategy in the Ivory Coast.

In October 2016, EDF created the ZECI company, a joint venture with the US company Off Grid Electric (OGE), now known as "Zola Electric", for the deployment of an off-grid energy project for rural and peri-urban populations (see also section 1.4.5.3.9 "Off-grid energy").

Ghana

In October 2017, the EDF group opened a local branch to support its development strategy in this country. Due to insufficient activity, the branch was closed on 30 June 2020.

The Group is also present in Ghana through the ZEGHA company (see also section 1.4.5.3.9 "Off-grid energy").

1.4.5.3.8 Middle East

The EDF group engages in development and project monitoring activities in the Middle East, and has a regional office based in the United Arab Emirates covering business in the region. In addition, the Group has offices in Qatar (Doha), Saudi Arabia (Riyadh), Lebanon (Beirut), Bahrain and the United Arab Emirates (Abu Dhabi and Dubai).

These offices generate commercial business and projects in these countries, where the main challenge in the coming years is to make progress in the post-petroleum energy transition.

The major projects in the zone are located notably in the United Arab Emirates with, in 2020, in Abu Dhabi:

- the signature, in January, of a shareholders' agreement with Masdar, one of the world leaders in the field of renewable energy, and a subsidiary of Mubadala Investment Company, for the creation of a co-enterprise for the development of solar power and energy efficiency projects. *In particular, this company will provide support for Abu Dhabi to achieve its energy efficiency strategy, aimed at cutting its overall electricity consumption by 22% and its water consumption by 32% by 2030*;
- the award of the Al Dhafra solar power project to a consortium comprising EDF group, through its subsidiary EDF Renewables, and Jinko Power Technology Co. Ltd. The future solar power plant, with installed capacity of 2GW, will be the most powerful in the world, and supply electricity to the equivalent of 160,000 local households each year (see section 1.4.1.3.3 "EDF Renewables activity").

Other major projects are located in Dubai with the customer DEWA (in charge of water and electricity in the Emirate):

- a development contract for an 800MW solar photovoltaic power plant. EDF, through its subsidiary EDF Renewables, is developing this project alongside Masdar and the customer DEWA. This power plant, commissioned in 2020, is one of the largest solar power plants in the world (see section 1.4.1.3.3 "EDF Renewables Business");
- an assistance agreement for the management of a 250MW dam pumping station, planned for the Hatta mountains in the Emirate of Dubai, the construction of which has already started, for the customer DEWA;
- an engineering consultancy project for the construction of a 3 x 233MWe thermal power plant in Al Aweer.

Also in the UAE, the EDF group has sought to establish a long-term relationship with Nawah, the operator of the Barakah nuclear plant and subsidiary of Émirates Nuclear Energy Corporation (ENEC). On 21 November 2018, EDF and Nawah signed a long-term master agreement under which EDF will assist Nawah with the operation and maintenance of the Barakah plant through various services such as safety, radiation protection, fuel cycle management and environmental monitoring.

Another major engineering consultancy project for the customer Kahramaa (water and electricity in Qatar) is currently being conducted in Doha, along with the construction of substations and high-voltage power line networks (this project being part of "phase 13").

In 2014, in Saudi Arabia, the EDF group signed a partnership agreement with the Saudi Electricity Company (SEC), the country's benchmark electricity operator, enabling a broad cooperation between the two groups, including training initiatives. In the extension of this agreement, the two GOC (Generation, Optimisation Center) contracts signed in 2016 and 2019 provide for support by EDF for the implementation of regional generation optimisation centres.

In addition, *via* its subsidiary EDF Renewables in partnership with Masdar, EDF won a 2019 call for tender for the financing, construction, and operation of the first wind power project in Saudi Arabia, with installed power of 400MW, at Dumat Al Jandal (see section 1.4.1.3.3 "Activities of EDF Renewables"). In 2020, in partnership with Masdar and the Nesma Group, EDF Renewables took part in the call for tender launched by Repdo ("Repdo2"). The Group should be awarded a 300MW contract in the Jeddah region.

EDF has had operations in Israel since 2010 through its subsidiary EDF Renewables, which, at end 2020, operates solar power projects connected to the grid with total gross capacity of 383MW, currently has 150MW under construction and confirmed the construction of an additional 157MW in 2021/2022. Furthermore, EDF Renewables Israel won two State calls for tender in 2020, representing approximately 70MW of floating solar power projects as well as solar power and storage projects totalling 225MW to be built by 2023. Furthermore, EDF Hydro's Hydraulic engineering centre supplies services to the first Israeli project for the storage of electricity through pumping, on Mount Gilboa.

1.4.5.3.9 Off-grid energy

The EDF group has more than 15 years' experience in off-grid power provision in Africa *via* companies created for that purpose based on territorial concessions. Since 2017, the EDF group has joined forces with innovative startups to supply power and services to customers in rural areas and on urban outskirts in line with their income and needs. Solutions include supplying power to central grids, installing mini-grids and providing solar power kits.

Such services enable more than a million people in South Africa, Ivory Coast, Ghana, Senegal and Togo to light and power their low-consumption household appliances such as a television or a radio, or to recharge their mobile phones. Customers in Kenya can buy solar-powered water pumps and thereby significantly improve their crop yields.

The EDF group, *via* EDF Pulse Croissance Holding with a 17% stake, teamed up with investment firm Meridiam to create NEoT Offgrid Africa with the aim of contributing to financing our energy supply and services solutions.

Togo – Bboxx

EDF bought a 50% stake in Bboxx Togo from Bboxx UK in November 2018 to undertake the sale, installation and maintenance of solar kits for rural households in Togo. In addition to the sale of Solar Home System, a partnership for the deployment of solar pumps was set up in 2020 with Kenyan company SunCulture and the Togo government [(1)].

South Africa – KES

In South Africa, the KES (Kukhanya Energy Services) company, created in 2002, is 50% owned by EDF, 15% by the local operator, Calulo, and 35% by Total. It initially developed its business through photovoltaic kits in Kwazulu-Natal, and then extended its activities into the Eastern Cape region.

Kenya – SunCulture

Since 18 July 2018, EDF group has been contributing to the development of Kenyan company SunCulture to support the sale, installation, and maintenance of solar pumps for rural households, mainly in Kenya. EDF assists SunCulture with its international development through a 16.1% stake held by EDFI in Savant Group, the parent company of SunCulture.

(1) See the press release dated 18 December 2020 "Bboxx, EDF and SunCulture work with the Togo government to accelerate access to sustainable farming using solar energy".

Kenya – Bboxx

In 2020, EDF took out a stake in Bboxx Kenya (*via* a 38.5% stake in EDF Bboxx Kenya, which owns 60% of Bboxx Kenya), the company which for the past few years has been carrying out the sale, installation, and maintenance of solar kits for rural households in Kenya.

Zambia – SMG

In order to develop its offer in mini-grids, in 2020 EDF took out a 12% stake in Standard Micro Grid Zambia, a startup identified through the "EDF Pulse Africa" competition, which develops and installs mini-grids using a solution with standardised containers and smart meters, enabling the sale of energy blocks on demand.

Ivory Coast – ZECI

The EDF group and Off Grid Electric (OGE), now known as "Zola Electric" – an American company involved in the distribution of solar energy in Africa, in which Electranova Capital, EDF's cleantech venture capital investment fund, holds a shareholding – created in October 2016 a joint company in the Ivory Coast, ZECI, in which they each hold a 50% stake, for the supply of competitive off-grid solar energy in Africa. Within the framework of this joint venture, the EDF group and Zola Electric assume the cost of the installation and maintenance of solar kits intended for households in rural areas and on urban outskirts.

Ghana – ZEGHA

Off Grid Electric, now known as "Zola Electric", the Ghanaian company CH group and EDF decided to create ZEGHA, in which they respectively hold a 50%, 20% and 30% stake, and launched the pilot phase in December 2017 on the Ivorian model.

1.4.6 Energy services and other activities

In a regulatory and societal environment which places the fight against climate change at centre stage, and in line with its *raison d'être*, EDF group aspires to significant growth in energy services to deliver high-performance, innovative, and sustainable solutions for its customers.

These services address the issues raised by local authorities, businesses, and domestic customers in a wide variety of fields: decentralised energy production, low-carbon heating networks, green hydrogen, smart lighting, electric mobility, smart building management, energy savings advice, and energy efficiency. The range of solutions offered by the Group is innovative, and meets customers' emerging requirements, notably reducing carbon emissions and improving energy performance.

1.4.6.1 Energy services

These solutions draw on the Group's expertise, in particular in R&D, and are implemented through its various subsidiaries. In June 2017, they were brought together beneath the single banner of the "EDF Solutions énergétiques" brand, placing the latter in a position to assist its customers in taking up the challenges of energy transition and economic efficiency.

In addition, in 2017, EDF group created "EDF Pulse Croissance", an organisation designed to be a startup incubator, with the role of exploring ecological and digital transition, providing its clients with innovative and competitive offers and services.

In 2018, EDF focused on electric mobility to help lower carbon emissions in the transport industry, which accounts for 20% of greenhouse gas emissions in Europe. This policy was further enhanced in 2019, in particular through the creation of Dreev, and in 2020 with the acquisition of Pod Point (see section 1.4.5.1 "United Kingdom").

In 2019, EDF engaged in local services with the acquisition of Hello Casa, now known as IZI Solutions. This new activity is aimed at improving home comfort and energy performance.

Lastly, in April 2019 EDF created Hynamics, a subsidiary dedicated to the production and marketing of low-carbon renewable hydrogen from electrolysis, aimed at addressing the needs of industry and heavy-duty mobility.

1.4.6.1.1 Dalkia

The EDF group has held a 99.94% equity interest since July 2014 in Dalkia, a leading player in the European energy services market. Dalkia provides a full range of services and has an excellent sales network in France, developing renewable energy and energy recovery, reducing energy consumption, and improving the performance of installations.

Dalkia has continued its essential business throughout the health crisis, in particular during lockdown periods, by organising crisis management and flexible, agile continuity, as well as rolling out teleworking on a massive scale.

Dalkia's operations

Against the backdrop of climate change, volatile prices, and rare resources, Dalkia provides its customers with expertise to develop, produce, and manage more environmentally-friendly and economical energy systems.

Accelerating customers' energy transition.
Dalkia is active throughout the energy chain, from decentralised production to demand management *via* distribution optimisation, accelerating energy transition for its customers.

Commitments
Thanks to its nearly 80 years of experience in managing heating and cooling networks, optimising industrial utilities, improving the energy performance of buildings, or using alternative and renewable energies, Dalkia offers its customers tailor-made solutions to reduce their energy consumption and to improve the environmental and economic performance of their installations.

Dalkia (including its subsidiaries) manages over 90,000 energy installations in France and abroad, achieving 6.7TWh of energy savings in 2020, as well as enabling its customers to avoid the emission of 4.1 million tonnes of CO2.

Dalkia and the development of renewable energy
Dalkia's core business is to make the most of local energy sources. Dalkia uses local sources of energy to provide its customers – both businesses and local authorities – with sustainable energy solutions:

- the development of renewable energy is a focus of Dalkia's priorities, particularly through the use of renewable and recovered energy: biomass, biogas, geothermal and recovered energy;
- a pioneer in energy transition, Dalkia encourages the production of energy from non-recyclable waste. Energy recovery also contributes to reducing greenhouse gases, limits the use of fossil fuels, and contributes to Dalkia's low-carbon goals.

Dalkia and energy savings
Dalkia's second business line is energy savings:

- Dalkia is innovating on a daily basis to achieve energy savings, through connected buildings that consume less and less, and energy renovation works to make buildings more efficient;
- Dalkia also optimises its customers' consumption by processing all their data using "Descs": energy performance management centres that combine digital and human intelligence.

Main subsidiaries of Dalkia in France

Dalkia Smart Building

Dalkia Smart Building, a wholly-owned subsidiary of Dalkia, specialises in designing and implementing solutions to help its customers adapt to the energy shift and digital transition in France. Complementing the regional scope, Dalkia Smart Building designs and implements solutions to upgrade existing school, government, indoor pool and office facilities and build new buildings and neighbourhoods (smart buildings, smart thermal and electric grids, green data centres, smart pools).

Dalkia Wastenergy

Dalkia Wastenergy, a wholly-owned subsidiary of Dalkia, specialises in waste recovery serving local authorities and industrial customers:

- waste recovery *via* incineration, anaerobic digestion and boilers running on solid recovered fuel (SRF) able to generate steam, electricity or biogas;
- materials recovery *via* compost, the sorting and packaging of recyclable materials and solid recovered fuel generation.

Dalkia Wastenergy designs, builds and currently operates facilities located in France, Great Britain and Poland.

Dalkia Froid Solutions

Dalkia Froid Solutions, a wholly-owned subsidiary of the Dalkia Group, specialises in industrial and commercial refrigeration and HVAC. Its aim is to supply all its customers, everywhere, with controlled temperatures, optimising energy consumption and protecting the environment thanks to innovative end-to-end management of the process encompassing consultancy, design, installation, and maintenance.

Dalkia Biogaz

Dalkia Biogaz, a wholly-owned subsidiary of Dalkia, is a company specialising in biogas generation, treatment and recovery. Dalkia has expertise in the field of anaerobic digestion, with the biogas produced used both in cogeneration and for direct injection into the natural gas distribution network.

Dalkia Air Solutions

Dalkia Air Solutions, a wholly-owned subsidiary of the Dalkia Group, provides a complete offering of auditing, design, installation and maintenance for compressed air, nitrogen, and breathing air systems aimed at all sectors of industry. Compressed air is an energy flow that has a high electricity component, and thus offers potential for energy savings.

CRAM

CRAM is a wholly-owned subsidiary of Dalkia, located mostly in north-western France (Normandy, Picardy and Île-de-France). It proposes and implements projects in the field of operations and maintenance, management, and construction of thermal and air handling installations. With headquarters in Le Havre, the company has a workforce of 600 and manages over 5,000 installations.

Dalkia EN

Dalkia EN (*Énergie Nucléaire*, Nuclear Energy) is a wholly-owned subsidiary of the Dalkia group and a go-to partner for EDF dedicated to the nuclear environment. The entity has a headcount of 500 working in two business lines: maintenance of backup electricity production resources and cold generation and ventilation systems for nuclear power plants and coordinating providers and building maintenance for nuclear and thermal power plants.

Main subsidiaries of Dalkia abroad

Dalkia Polska Solutions

Dalkia Polska Solutions, based in Poland, designs, builds and maintains technical facilities (ventilation, heating, air conditioning, fire protection, etc.) for commercial buildings and industrial sites. It also provides innovative solutions for the building's energy performance management.

Dalkia Polska Energia

Dalkia Polska Energia is mainly specialised in the generation and distribution of heat in the region of Katowice in Poland (Upper Silesia). It has recognised expertise in the energy recovery of mine gas as an alternative to coal to be used by heating networks and electricity distribution facilities.

Dalkia Rus

Specialised in energy efficiency for industrial customers, Dalkia Rus is one of the pioneers in the energy services sector in Russia.

Imtech

Imtech, jointly owned by Dalkia and EDF Energy, specialises in major HVAC and electrical engineering works, technical facilities maintenance, and data acquisition and control systems integration. Imtech provides its services to the construction, industry and tertiary sectors and public authorities.

Imtech is established in the United Kingdom, Ireland and Scandinavia with its subsidiary Suir Engineering. Its subsidiary Breathe is a specialist in energy performance in the UK.

Groom Energy Solutions, rebranded Dalkia Energy Solutions

Based in Massachusetts, Dalkia Energy Solutions provides companies and industrial customers with a comprehensive approach to consultancy, project management and the performance of energy efficiency work, with nationwide coverage in the United States.

Aegis Energy Services

Bought out in August 2018, Aegis Energy Services LLC, a company based in Holyoke, Massachusetts, specialises in small gas cogeneration plants, which it designs, produces and commissions, and maintains. The firm has installed just under 1,000 cogeneration plants since it was founded in 1985.

1.4.6.1.2 Citelum

Citelum is the subsidiary of the EDF group dedicated to associated smart lighting and connected services, and one of the leading players in the field in France and throughout the world.

With 600 employees in France, Citelum employs 2,500 people, mainly in Europe (including France, Italy, Spain and Denmark) and in South America (including Mexico, Brazil and Chile), which enables it to manage the services of leading cities throughout the world (Mexico City, Copenhagen, Barcelona, Rome, etc.). Citelum manages over 3 million street lights all over the world, lighting the way for 30 million residents.

The technological changes in lighting equipment currently enable it to make use of an existing connected infrastructure, thereby facilitating energy savings, remote management of installations and improvements to security as well as showcasing cultural heritage. This lighting equipment, connected to other devices (sensors, cameras, etc.), offers new value-added services in the areas of the prevention of pollution, video-monitoring of the territory, information to users or the management of urban mobility and parking.

Citelum operates on the following three value chains:

- increasing attractiveness for customers through the optimisation of lighting, while limiting energy expenditure and its environmental impact;
- improving perceived security;
- optimising mobility and relieving traffic congestion by providing solutions for traffic lights, traffic control, and electric vehicle recharging and smart parking infrastructures.

Citelum marks out its difference through its capacity to assist in all phases of a project, from design and completion of the works to operation and maintenance, by incorporating into its service offer: financing solutions, innovation with its Citegestion subsidiary's digital urban space management platform, MUSE®.

Preserving the environment, wellbeing, and development through electricity and innovative service solutions are at the heart of Citelum's business. The solutions provided by Citelum, notably smart lighting, are developed to save energy in cities, minimise light pollution, and preserve biodiversity. Light plans developed by Citelum in France and internationally are designed to adjust lighting to the nocturnal cycles of neighbouring fauna and flora.

In particular, Citelum's business is in global performance markets that include specific performance commitments in figures. It is developing innovative solutions in the collection and management of public data in order to deliver additional services to local authorities and residents, enhancing the quality of public services and safety, and contributing to better quality of life. For private-sector clients, Citelum also deploys indoor lighting renovation solutions for their buildings, providing energy savings by adjusting lighting levels to match their needs and business.

Internationally, Citelum has strengthened its portfolio by entering into new contracts, in particular in Italy, Spain, and South America (see section 1.4.5.3.5 "South America").

1.4.6.1.3 EDF Pulse Croissance

EDF Pulse Croissance is helping to prepare the future of EDF group by exploring new business models for energy and digital transition. Established in 2017, EDF Pulse Croissance is EDF group's startup incubator. The purpose of EDF Pulse Croissance is to create new growth drivers for EDF by providing innovative and competitive products and services to households, businesses and local authorities. To create new business lines and services, EDF Pulse Croissance has developed a model based on two complementary activities: a corporate venture and a startup incubator. To address emerging needs and anticipate new political, economic, societal, technological, environmental, and legal trends, it has developed a customer and product-centric approach.

Since it was set up, EDF Pulse Croissance has invested about €250 million [(1)] in 23 startups and built up stakes in 16 investment funds.

Four areas will be prioritised:

- industrial efficiency for our business customers;
- residential services;
- sustainable town and country planning;
- decentralised energy systems.

EDF Pulse Croissance is a closely-knit team that works closely with R&D, EDF group's business lines, and partner stakeholders working in startups and open innovation. In 2020, EDF Pulse Croissance developed a new roadmap detailing its future investment and incubation priorities, in a collaborative undertaking entitled "Energy Transition: New Markets and New Business Lines" (*Nouveaux Marchés, Nouveaux Métiers de la transition énergétique*). This defines the most promising growth opportunities in terms of value creation, innovation, and carbon neutrality in connection with EDF group's business lines that are consistent with its *raison d'être*.

Incubator

EDF Pulse Croissance draws on EDF group's ideas and expertise to design and develop new business and services. The incubator offers bespoke support for employees and enlists in-house and third-party experts to test, create, and develop business models. This support helps intrapreneur employees as well as EDF group as a whole, upskilling the workforce and participating in the Group's transformation.

The EDF Pulse Croissance model provides incubated projects with an investment vision and constant exposure to markets.

EDF Pulse Croissance supports startups in a range of fields relating to the energy and digital transition:

- **Hynamics**, which uses water electrolysis powered by low-carbon, renewable electricity to produce low-carbon hydrogen;
- **Metroscope**, digital twin software for improving the performance of industrial installations;
- **Perfesco**, which has developed an innovative finance solution for improving energy efficiency in industry;
- **Exaion**, providing environmentally-friendly, competitive, and sovereign cloud-based blockchain and high-performance computing solutions;
- **Agregio**, an aggregator for renewable energy production and flexible consumption

An investor and fund partner

To develop new business activities and innovative solutions, EDF Pulse Croissance can invest directly in fledgling startups or put them in contact with the Group's ecosystem – particularly with some fifteen dedicated funds in which EDF Pulse Croissance has a stake.

Startups in which EDF Pulse Croissance is a shareholder enjoy multiple benefits:

- synergies with EDF group's other startups, subsidiaries, and business lines;
- strategic support from EDF Pulse Croissance in its capacity as an active shareholder (EDF Pulse Croissance is represented on the Board of Directors of each startup in the portfolio);
- its experts' detailed familiarity with the energy market;
- a source of funding;
- support in the form of tools to structure business.

EDF Pulse Croissance can also create joint ventures with startups able to explore new business models and set out to conquer new markets in France or abroad. Essentially, investment is seen as part of a comprehensive business and industrial partnership.

Furthermore, EDF Pulse Croissance invests in venture capital funds to strengthen its position in the innovation ecosystem, reduce EDF's financial exposure, and develop skills and synergies within EDF group.

This investment strategy is commensurate with the issues facing the Group, focusing on:

- general and multi-sector funds such as smart cities and clean tech, chosen for their reputation in a geographical area that is both active and relevant for EDF;
- and in specialist and/or seed funding for new technologies designed to provide better integration of supplementary technology building blocks alongside those already used by R&D in particular.

This strategy has resulted in the Group investing in about fifteen thematic funds, mostly in France, but also in Europe, North America, and China. In 2020, to further enhance its partnership strategy and expand its international portfolio, EDF Pulse Croissance invested in 2 new US funds.

In 2020, EDF Pulse Croissance invested in 5 startups, including one subsidiary derived from an intrapreneurial project.

New arrivals in the EDF Pulse Croissance portfolio in 2020

Startups incubated by EDF Pulse Croissance

Urbanomy

Launched at the beginning of 2020, Urbanomy is the result of an intrapreneurial project incubated by EDF Pulse Croissance and a wholly-owned subsidiary of EDF. Urbanomy targets the market for smart cities internationally, more especially in the UK and Germany. It provides strategic, technical, and economic consultancy services to urban development stakeholders, notably private-sector stakeholders such as property developers, private developers, and investors. Its integrated offering is structured around six pillars: energy efficiency, energy systems, urban mobility, the environment, quality of life, and energy communities. Urbanomy was set up by 3 EDF employees from R&D in the UK, the International Division, and EDF Pulse Croissance.

EDF Pulse Croissance shareholdings

Securkeys

Securkeys offers an anonymous site watch service and secure one-hour duplicate key delivery throughout France, 24/7. Securkeys customers send a copy of their keys in a sealed envelope to their nearest approved Securkeys security centre. If they lose their keys or find themselves locked out, they can ask for the duplicate to be returned by an approved agent. EDF Pulse Croissance has bought a share in the company alongside other financial and institutional stakeholders. In 2018, SecurKeys won a EDF Pulse Croissance Request for Proposals in home services.

TeepTrak

TeepTrak specialises in monitoring industrial performance in real time. The company markets a solution allowing industrial companies to capture data about the performance of their production plant (speed, operating time, downtime, and overall equipment efficiency) and analyse this data to improve their productivity and yield. TeepTrak provides an affordable, easy-to-install solution (comprising both hardware and software in a turnkey package) compatible with all types of machinery used by VSBs, SMEs, and multinationals. In May 2020, EDF Pulse Croissance took a stake in the share capital of TeepTrak alongside Xange in order to enrich its offering in the field of Industry 4.0.

(1) Source: EDF Pulse Croissance Holding, financial statements as of 31/12/2020.

Archipels

Archipels develops digital trust services (document and data certification, probative value, etc.) based on a consortium blockchain infrastructure. This infrastructure certifies document origin, authenticity, and integrity. Archipels seeks to combat fraud, facilitate companies' support for new customers, and cut costs relating to legally required "Know Your Customer" document verification. The offer is directed at professionals based in France and, ultimately, in Europe. EDF Pulse Croissance invested in Archipels in 2020 alongside Caisse des Dépôts et Consignations, Docaposte, and Engie.

PowerUp

PowerUp is developing a solution to improve Lithium-ion battery performance, enabling batteries to last up to twice as long. PowerUp monitors batteries remotely, tracking their health and predicting their life expectancy. It then uses this data to manage battery charging management to preserve batteries and increase their lifespan. PowerUp's solution is directed mainly at stationary storage use cases (*e.g.* backup batteries and autonomous fleet managers) that can be developed in partnership with R&D and CEA. In November 2020, EDF Pulse Croissance took out a stake in PowerUp's share capital alongside SuperNova Invest and business angels. This will help accelerate the development of EDF group's storage solutions, thus contributing to the goals of EDF's Storage Plan, launched in 2018.

Requests for proposals

EDF Pulse Croissance organises requests for proposals designed to promote startups, VSBs, and SMEs that are already established or maturing, working in innovative technologies, products, tools, and sets of solutions, and likely to contribute to the development of a new business line or sales offer. Selected in liaison with the Group's business lines and third-party experts, the winners receive support from the Group and its partners to develop the innovative solution in question.

Since it was first set up, EDF Pulse Croissance has launched four requests for proposals:

- in 2017, a request for proposals concerning international nuclear decommissioning put together with the Deconstruction and Waste Project Department (DP2D) identified a number of promising solutions, including Cyclife Digital Solutions (formerly Oreka Solutions), now a subsidiary of EDF group;
- in 2018, two requests for proposals were organised with EDF's Domestic Customer Marketing Department in the field of support for elderly domestic customers (the silver economy) and home services. Two of the startups that won these requests for proposals benefit from EDF Pulse Croissance funding: Zenpark in 2018 and Securkeys in 2020;
- in 2019, EDF Pulse Croissance launched a further request for proposals, this time in the realm of e-health, in partnership with AG2R La Mondiale, to identify innovative solutions in support of prevention, screening, and assistance with chronic diseases in the various living environments. In December 2019, the two innovative startups ExactCure and Pheal were rewarded. ExactCure received EDF Pulse Croissance funding to develop a personalised simulator for taking paracetamol during the Covid-19 crisis.

1.4.6.1.4 Other service activities of the EDF group

Other subsidiaries within the EDF group complete the range of energy services that EDF offers. These focus on specific areas, targeting different categories of customers (residentials, professionals, businesses and local authorities) and cover a wide range of activities including research, construction, equipment maintenance, investment financing and assistance with obtaining permits and subsidies.

Energy management

To help customers manage their energy and fluid consumption, the EDF group provides facility monitoring and management solutions. Its subsidiaries Netseenergy and Edelia are active in this strategic area.

Netseenergy

A wholly-owned subsidiary of the EDF group specialising in energy intelligence for buildings and industrial processes, Netseenergy supports companies and local authorities in energy transition by providing technological and human resources throughout the energy management value chain in a variety of ways:

- recovering multi-fluid consumption data (electricity, gas, water, etc.): instrumentation, metering, remote readings, invoice flow, etc.;
- formatting retrieved data using iBoard, the online interface for tracking, analysing, and controlling B2B energy efficiency: Data Analytics (indicators, charts, aggregation), Reporting, Algorithms;
- support for energy efficiency backed by a human energy manager (a consultancy service to accompany the iBoard solution offered to customers seeking ISO 50001 certification of their energy management systems).

Netseenergy processes almost 9 million items of data daily for a total of 20,000 sites, using bespoke solutions tailored to the needs of its customers: energy performance control, innovative energy audits, and more. A specialist in the IoT (Internet of Things), collecting data from 60,000 connected objects every day, Netseenergy provides energy management for total space of over 120 million square metres.

Edelia (EDEV Téléservices)

Edelia is a wholly-owned subsidiary of EDF group that designs and implements solutions for individuals and businesses to monitor and control their energy consumption. Its online platform provides a range of innovative digital services to the EDF group customers. Edelia also offers modular tools based on the IoT that can be adapted to users' own ecosystems, thus getting the most out of connected objects in smart homes and enhancing digital customer tools.

Connected home

A wholly-owned subsidiary of EDF group set up in 2016, Sowee is the only energy market player to combine energy sales with a Connected Station for domestic customers. The Connected Station provides both comfort and energy savings by remotely controlling domestic gas and electric heating, and simulating energy budgets on the basis of temperatures and real-time use. Daily routines are facilitated by the integration of Amazon Alexa in the Connected Station's speaker base and the display of practical information such as indoor air quality, weather, journey times, etc.

Sowee has also joined forces with industrial players in the sector (Saunier Duval, Muller, Aldes, Delta Dore, and Daikin) to provide coordinated supervision of natively connected new equipment (boilers, ventilation, electric radiators, heat pumps, lighting, and roller shutters). In 2021, Sowee also launched a demand-side management option for owners of connected stations in its fleet.

Electric mobility

EDF group launched the Electric Mobility Plan (*Plan Mobilité Électrique*) in October 2018 (see section 1.3.2 "CAP 2030: strategic priorities").

IZIVIA

IZIVIA, a wholly-owned subsidiary of EDF group, is a flagship player in the electric mobility market in France. IZIVIA provides charging solutions for electric vehicles targeted at local authorities, energy consortia, and businesses – and, since January 2020, co-ownerships. IZIVIA makes its expertise available to customers through a full-service offering: supply and installation of charging stations, infrastructure supervision and maintenance, and service packages.

IZIVIA is the leader in public charging stations in France and one of the leaders on the business segment, operating over 10,000 public and private-sector charging points. In 2020, IZIVIA achieved significant wins on the local authority market (including the MObiVE network in Nouvelle Aquitaine and SIGEIF in Île-de-France), with companies (31 PSA sites across Europe), and for leading retail chains. In another development, IZIVIA IG, a wholly-owned subsidiary of IZIVIA, is aiming to equip 1,500 EDF group sites with charging stations by 2030.

Together with investment fund Demeter, IZIVIA is rolling out a network of 641 charging points in the 59 municipalities of the Metropolis of Lyon. This network is one of the most ambitious projects to roll out charging stations across an entire area in France to date. IZIVIA is also preparing to roll out a network of 300 fast charging stations located at high-traffic sites close to trunk roads.

To facilitate electric car journeys, in its capacity as a mobility operator, IZIVIA also offers a Pass coupled with a mobile app allowing users to recharge at over 100,000 charging points, with interoperability across France and the whole of Europe.

Electrical engineering

HTMS, a wholly-owned subsidiary of EDF, has acquired three companies working in electrical engineering, brought together under the EDF Electrotechnics brand. HTMS has thus become a unique player in the field of electrical engineering, covering all requirements and all the components of HVA, HVB and LV solutions.

EDF Electrotechnics specialises in the manufacture of HVA substations, carrying out design, integration, installation, equipment, repair, sales, and rentals. It is involved in the operation and maintenance of high-voltage (HVA and HVB) equipment and substations, the supply and replacement of circuit breakers and transformers, troubleshooting, project management support and training.

Heating: CHAM

CHAM is a wholly-owned subsidiary of the EDF group, specialising in the installation, maintenance, and repair of domestic electric heating, ventilation and air conditioning equipment: boilers, heat pumps, air conditioners, thermodynamic tanks, etc.

With 1,000 employees across France, CHAM completes upwards of 800,000 tasks a year, meeting the needs of homeowners, private and public collective housing, and businesses.

Cham draws on its local and digital channels to win over and serve customers. Cham is preparing to roll out e-maintenance for some of its customers. To do so, it is trialling remote diagnosis and repair.

In its relentless pursuit of internal and external growth, CHAM is positioning itself as a specialist energy services provider based on three key strengths: professional staff, network expertise and strong local markets.

IZI by EDF

Launched in February 2019, *IZI by EDF* is EDF's brand covering services other than energy in France for domestic customers and very small businesses, irrespective of whether they are EDF customers, to support their facilities and energy transition.

In 2020, *IZI by EDF* released a full-service offering for sustainable homes and electric mobility:

- a turnkey energy renovation offer focusing on heating solutions (heat pumps and boilers), insulation, ventilation, and window installation, including calculation and deduction of all regulatory aid from the customer quote, as well as a finance solution and a quality commitment;
- a full-service solution to transition to electric mobility, including the installation of a home charging station, green electricity supply with *Vert Électrique Auto*, the *pass mobilité* (operated by IZIVIA) mobility pass to recharge anywhere in Europe, and electric vehicle leasing.

Through *IZI by EDF*, EDF is positioned as a general contractor-assembler for customers. It assumes liability, guaranteeing successful services and providing the ten-year warranty itself. It provides a strong commitment to the quality of work and customer relations, using carefully selected qualified contractors.

IZI by EDF also provides offers from EDF group's specialist subsidiaries (CHAM, IZIVIA, and EDF ENR) and certain other strategic partners (AXA, Homiris). *IZI by EDF* is thus committed to providing peace of mind and sustainable comfort for French consumers.

Local Energy Management

In summer 2019, EDF group created the Local Energy Management (LEM) entity to speed up the development of innovative offers relating to decentralised energy management. LEM provides coordination for companies developed through intrapreneurship or acquired through external growth, including Agregio, Dreev, e2m, PowerShift, and Store & Forecast, in a range of business lines:

- aggregating, managing, and promoting local flexibility, both upstream (intermittent production from wind and solar farms) and downstream (consumer load shedding capacities);
- marketing renewable energy production through new supply models such as Power Purchase Agreements (providing renewable energy from renewables producers), Virtual Power Plant platforms, and peer-to-peer sales, through which domestic customers can buy from producers using blockchain);
- smart charging solutions for electric mobility;
- software solutions for energy optimisation of local electricity systems through energy forecasting and storage.

A wholly-owned subsidiary of EDF, Agregio is an aggregator directed at two types of customer: producers of renewable electricity (wind and solar power, etc.) and electricity consumers (industries, companies, etc.). For electricity producers, Agregio offers tailored solutions to optimise and sell their production on the markets and secure income over time. Agregio is also aimed at industrial and tertiary consumers, who are willing to reduce or shift their consumption in exchange for compensation, according to the needs of the electricity system.

Energy2market (e2m), is a company specialising in the aggregation of renewable production and local flexibilities. It manages and operates over 5,000 connected, decentralised energy production and flexibility sites (wind farms, solar farms, biomass plants, etc.) with total installed capacity of over 4GW. e2m also markets Virtual Power Plant operating and optimisation systems for its European customers.

At the end of 2020, EDF group is among the European leaders on these new markets, with 8GW of decentralised production/consumption assets and over 5,000 optimised decentralised assets.

1.4.6.2 Gas activities

In Europe, the EDF group uses over 270TWh of gas. As such, EDF has developed a gas strategy to ensure the security of gas supply for its more than 5.4 million customers [(1)], its cogeneration plants and its gas power plants.

Thus, EDF group is present on the natural gas market in France and across Europe, mainly through Edison in Italy, EDF Energy, and Luminus. Since 1 August 2017, Edison has become EDF group's gas platform under a service agreement to manage assets and develop its upstream business (see section 1.4.5.2.2 "Edison Strategy"). It also relies on EDF Trading for its short-term operations relating to transactions on the continental and United Kingdom wholesale markets, as well as on Dalkia (for cogeneration plants).

The optimisation of EDF SA's LNG asset portfolio flexibility is being managed by JERA Global Markets, a joint venture between EDF Trading Limited (33.33%) and JERA Trading International Pte (66.67%).

Lastly, the Group is present outside Europe, especially in the United States, where EDF Energy Services is an important natural gas supplier of major industrial customers and distributors.

1.4.6.2.1 Natural gas end-market

In Europe, on 31 December 2020, the downstream customer portfolios were as follows:

- France (EDF and ÉS): around 1.9 million customers (retail and key accounts) and about 33TWh volume sold;
- Italy (Edison): around 0.9 million customers, and about 83TWh gas volume sold;
- United Kingdom (EDF Energy) [(2)]: around 1.9 million customers and about 30TWh volume sold;
- Belgium (Luminus): around 0.6 million customers and about 11TWh volume sold.

1.4.6.2.2 Gas assets and projects

1.4.6.2.2.1 Supply sources

In Europe, the Group's gas and LNG supply comes from short- and medium-term gas markets and from a diversified portfolio of short-term and long-term contracts, originating from Qatar, Russia, United States, the North Sea and North Africa.

In the United States, the majority of the supplies originates from the gas markets.

In the rest of the world, specific contracts have been concluded to ensure the supply of the Group's gas power plants.

(1) Customers are broken down by number of delivery points at end 2020.

(2) Excluding Northern Ireland.

In order to continue being able to supply its customers, the Group aims to strengthen and diversify its medium and long-term sources of gas. In particular, in LNG, EDF has taken out medium and long-term contracts, one of the aims of which is to enhance the regasification capacity of the Dunkirk LNG terminal. Furthermore, in 2021, Edison is due to start importing one billion cubic metres of gas per year from Azerbaijan under a long-term contract (see section 1.4.5.2.3.2 "Gas business").

1.4.6.2.2.2 Infrastructures

Gas pipelines

Apart from its various rights to transport capacity in the European network, the EDF group participates, through its Edison subsidiary, in infrastructure projects for gas importation (see section 1.4.5.2.3.2 "Gas business").

LNG regasification terminals

In line with the Group's gas strategy, EDF is the main shipper using the Dunkirk LNG terminal in the long term.

EDF retains the right to use 80% of the Rovigo offshore terminal's regasification capacity, *i.e.* 6.4 billion cubic metres a year, through Edison (see section 1.4.5.2.3.2 "Gas business").

The Group also holds regasification capacities in the terminal of Zeebrugge (Belgium).

Small Scale LNG supply chain

Since 2018, Edison is building a small scale LNG supply chain to sell LNG in Italy comprising a first onshore depot and a small scale LNG terminal in order to help reduce CO_2 emissions for transport by road and sea (see section 1.4.5.2.3.2 "Gas business").

Storage

In Germany, the EDF group has storage for natural gas in salt cavities situated in Etzel. The aboveground facilities are operated through a 50/50 joint venture with EnBW. EDF has around 190 million cubic metres of volume capacity in this salt cavity storage.

With respect to storage activities of the Group in Italy and in the United Kingdom, see respectively, sections 1.4.5.2.3.5 "Regulated activities" and 1.4.5.1.2.2 "Thermal generation and gas storage".

The Group also holds storage rights in the Netherlands, Belgium and France.

1.4.6.2.2.3 Exploration and Production (E&P)

Following a strategic repositioning, Edison announced on 17 December 2020 the sale to Energean of its upstream business in oil & gas exploration and production (excluding Algeria and Norway). On 30 December 2020, Edison announced that it had entered into an agreement with Sval Energi for the disposal of 100% of Edison Norge AS, which owns the oil & gas exploration and production business located in Norway (see section 1.4.5.2.2 "Edison Strategy").

1.4.6.3 Optimisation and trading: EDF Trading

EDF Trading (EDFT) is the EDF group's interface with the wholesale energy markets providing market, optimisation and risk management services to EDF group companies as well as third parties. The company operates across Europe, North America and Asia in the wholesale markets primarily in the electricity, natural gas and LPG business and provides customers with access to financial oil and environmental products. LNG and coal and freight activities are carried out by JERA Global Markets in partnership with JERA of Japan. Through its North American subsidiary, EDFT is one of the main service providers to electricity producers and energy suppliers for access to wholesale markets, and one of the five leading electricity suppliers for major-account customers in sales and industry.

EDF Trading's registered office is located in London. The company has around 820 employees globally and its regulated activities are authorized by the UK's financial market regulator, the Financial Conduct Authority.

Among other things, EDFT provides a full range of wholesale market services to EDF DOAAT (see section 1.4.3 "Optimisation activities for EDF in France") and EDF Customers Division in France and serves as a route to market for the other entities of EDF group.

European Electricity market

EDF Trading is a leading participant in the European electricity wholesale market trading almost 2,000TWh annually. The company provides a full range of risk management services to EDF group's asset operators and to third parties. It has an extensive geographic footprint and scale of activity which makes it able to adapt quickly to changes in the market and to develop new business where appropriate. In 2020, EDFT developed its PPA [(1)] activity to support renewable energy development, and extended its presence in the Nordic markets.

European Gas

EDF Trading is also a leading participant in the European gas wholesale market trading 590bcm annually. It optimises EDF entities' gas assets including production, transmission rights, long-term supply contracts and re-gasification and storage capacities. This enables EDFT to support the EDF group and third party customers with complete gas wholesale market solutions. In 2020, EDFT expanded its flow activities with an increasing number of customers or suppliers in Europe and some major players accessing the European markets to hedge their portfolio.

North American wholesale markets

EDF Trading North America is a leader in the wholesale energy markets in North America, where it benefits from broad geographical coverage, offering solutions to customers across the entire North American energy value chain. It provides energy management solutions, natural gas supply, and real-time services for electricity producers in the USA. As one of the leading suppliers of production services for electric power plants in the USA, EDF Trading North America manages over 29GW for 105 electric power plants. For retail energy aggregators, it provides supply services on the wholesale market, as well as services to interface with Independent System Operators (ISOs).

Retail sales operations in North America

Ranked in the top five electricity suppliers to commercial and industrial customers in North America, the retail supply and services team offer natural gas, electricity, and environmental products to a portfolio of commercial and industrial customers, managing a portfolio of 2.6GW of customer demand response. Some of these customers are also active in Europe, allowing EDFT to address their needs on a worldwide basis. In 2020, EDFT expanded its market coverage and developed its activity to serve the interest of C&I customers for renewable energy supply.

Environmental products

EDF Trading is committed to the environmental products marketplace and, as subsidiary of a leading renewable operator, it offers a broad range of multi-commodity hedging solutions that support the EDF group and third party customers' decarbonization targets around the world. EDFT is active in the compliance and voluntary carbon markets, guarantees of origin certificates in Europe, Renewable Energy Certificates in the US, and International Renewable Energy Certificates in the rest of the world. In addition, it is a recognised provider of risk management products in the European weather market. In 2020, EDFT developed its activity to support EDF group entities' green marketing initiatives and to propose high quality certificates to customers interested in offsetting their carbon footprint.

International markets

Following the sale of its coal and freight business to JERA in April 2017 and the merging of their LNG optimisation and trading activities into JERA Global Markets in 2019, EDFT holds a 33% financial stake in JERA Global Markets, a leading seaborne energy trader. In 2020, the Company continued to develop its global activities, in particular in the LPG market and EDFT also entered the Japanese Power market.

(1) Power purchase agreement.

1.4.6.4 Equity interests

1.4.6.4.1 EDF Trading Logistics

With a fuel oil supply volume of approximately 1.1 million tonnes and 0.7 million tonnes of coal processed in 2020, EDF Trading Logistics acts as EDF's vehicle for fuel oil and liquid biomass purchases. It organises fuel oil, liquid biomass and coal supply logistics operations for all of the EDF group's thermal plants in mainland France, Corsica and France's overseas departments, in close collaboration with DOAAT, EDF PEI and SEI. It controls the coal terminals in the ports of Le Havre and Montoir de Bretagne.

In addition, EDF Trading Logistics provides the Group its expertise in regard to managing risks relating to the transport of fuel oil (hazardous materials), an activity that has received ISO 14001 certification which was renewed on 31 October 2019, and in the management of environmental crises arising from this activity.

1.5 Research & development, patents and licenses

The EDF group's Research & Development (R&D) activities are handled on the one hand by the Research & Development Division – EDF R&D and on the other by certain Group subsidiaries. These activities are complementary and in line with the Group's CAP 2030 strategy. A *Charte R&D* coordination scheme for these has been drawn up at Group level.

EDF group's R&D is both integrated and cross-disciplinary, in order to facilitate synergies and method transfers between the different divisions within the Group. It employs 2,663 [(1)] persons worldwide.

Skills cover all the Group's field of activities: renewable energies and storage, networks, nuclear generation, thermal, hydropower, energy management, trade and services, IT systems, environment. They are specific to particular disciplines, business lines and projects, and also come together for work on major systems.

EDF R&D is currently organised on a multi-site basis, with several sites located in France and abroad, mainly in Germany, the UK, China, the United States, Singapore and Italy.

EDF R&D's main centre is located in Palaiseau on the Paris-Saclay campus where it opened in 2016. At end 2020 EDF's R&D employed 1,839 people in France representing 30 nationalities.

The main missions of the EDF group's Research and Development Division (R&D) are firstly, to support the Group's divisions and subsidiaries on a day to day basis, by providing them with its top-level expertise and high performance practices, and secondly, to contribute to build the Group's future by anticipating the developments and major challenges with which it is confronted.

In 2020, EDF group defined its *raison d'être*: "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development".

R&D is now engaged in the pursuit of this goal. Its avenues of research are structured around three broad topics:

- electric transition;
- climate transition;
- digital and societal transition.

In 2020, the EDF group's total R&D budget was €685.2 million. It comprises EDF's R&D budget of €518 million, as well as the research carried out by certain wholly-owned subsidiaries, mainly Framatome, EDF Energy and Edison. This is one of the largest R&D budgets of any major electricity company.

It should be noted that 98% of EDF R&D's operating budget in France is dedicated to decarbonation and energy systems transition. In particular, expenditures covered research into energy efficiency, uses of electricity as a substitute for fossil fuels, renewable energies and their insertion into the grid, energy production and storage, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of disturbances.

1.5.1 R&D priorities

EDF R&D's work serves all the Group's business lines. For each of them, it offers technological solutions or innovative business and economic models designed to improve their performance, and prepare the Group's future in the longer term by means of medium and long-term anticipation initiatives. It is one of the factors in EDF becoming a global industrial group providing low-carbon electricity systems.

Its research focuses on three main areas, in line with the CAP 2030 project:

- electric transition: electricity, especially if generated using low-CO_2 emission facilities, will play a major role in decarbonising the end uses of energy. Among these uses, electric mobility and innovative heat production methods are important development drivers for EDF;
- climate transition: this focus includes issues in relation to EDF's electricity generation facilities. EDF group, a champion of carbon-free energies, endeavours to ensure that its facilities emit as little CO_2 as possible and, therefore, to make a major contribution to the Paris Agreement climate goals;
- digital and societal transition: this focus recognises the advent of connected objects and digital tools, which have been developing exponentially in the domestic and business worlds in recent years. This transition is inseparable from the very significant changes in our lifestyles and actions with respect to energy use.

The research work on grids led on behalf of Enedis is carried out under a services contract, which defines obligations that guarantee the protection of commercially sensitive information and compliance with the principle of the independent management of the distributor. Enedis also has a complementary R&D programme, independently of that agreed for EDF R&D.

1.5.1.1 Electric transition

The development of energy efficiency, distributed renewable energies, new energy storage solutions, regulatory and technological changes (digitisation and smart meters) as well as market deregulation, have all led to profound changes in the relationship between energy firms and their customers. They allow customers to be actively involved in their consumption and production of energy, on an individual or regional scale.

Shifts in European and French legislation and regulation, exemplified by the EU's Clean energy for all Europeans Package and France's National Low-Carbon Strategy (SNBC) and multiyear energy programme (PPE), as well as various tax incentives to replace fossil fuels with clean electricity (batteries vs combustion engines, heat pumps vs oil-fired boilers) are shaping the future energy landscape.

Technical/economic and regulatory work done by R&D, some of it in partnership with France's Building Scientific and Technical Centre (CSTB) have clearly demonstrated that generalising electric applications in homes and service sector buildings is consistent with the trajectory established by France's National Low-Carbon Strategy. Shared during the public consultation phase prior to the first environmental legislation covering new builds, these findings have helped ensure built assets are firmly set on a course to becoming carbon-neutral, with an initial milestone as soon as 2021.

(1) Calculated as full-time FTEs.

Electric transition for buildings and industry also has an important role to play in encouraging the development of distributed renewable energy. Electric applications are all becoming connected and controllable, from basic radiators to electric vehicle charging stations *via* increasing numbers of white goods applications. These can offer more flexibility for the electricity system.

EDF customers are also becoming engaged stakeholders, with access to information about their energy use virtually in real time, advanced advice on how to make energy savings, and energy efficiency suggestions made *via* increasingly sophisticated digital interfaces. EDF group subsidiaries' connected boxes and stations feature algorithms developed by EDF's R&D: these can provide dynamic management of all applications to achieve targets set by a household in respect of a given budget, comfort, CO_2 emissions, or self-production.

The dynamics of the energy transition in the territories are creating new uses of electricity and new expectations. For example, energy communities are emerging: cities have expressed enthusiasm for optimising infrastructures and their management (transport, waste treatment, buildings, energy generation, grids) and aim to become smart cities or "sustainable cities".

EDF's R&D is thus contributing to industrialisation and performance of these local ecosystems. Over and above the legal and economic structuring of the energy communities that emerge in collective self-consumption projects, R&D researchers also help to overcome technical barriers relating to the real-time monitoring of local electricity production and consumption.

Data-related issues are also present in the field of heating and cooling networks. EDF's R&D has helped to design digital twins of networks to optimise their operation.

R&D also supports local regions, for instance by contributing to the community dynamic among industries at Fos-sur-Mer and the Dunkirk sea port, conducting experimental projects relating to energy and materials optimisation at the local level.

Battery storage is a crucial factor in electric mobility. R&D research in this respect consists, firstly, in characterising battery safety and performance in the lab, and secondly, in innovating in the realm of breakthrough technologies with the potential to deliver significant improvements in battery life and/or cost. R&D is also studying non mobile applications for the reuse of batteries that were originally used in electric vehicles (combining them with renewable energies, system services, etc.). In the longer term, R&D will adopt a similar approach for the hydrogen technologies that are used for mobility, including electrolysers and charging stations, as well as fuel cells for heavy transport and light vehicles.

Energy transition towards a low-carbon economy in Europe also involves reducing the carbon footprint of electricity systems, *i.e.* smart grids. It raises not only technical, economic and regulatory issues and will require taking on new challenges, such as:

- managing the intermittence of production sources that use renewable energies and pushing back the limits of their inclusion in electrical systems; As part of the EU-SysFlex project in particular, EDF R&D is working with 34 European partners on the development of new sources of flexibility to achieve the goal of 50% renewable energy in Europe by 2030;
- integrating new uses of electricity by optimising the production mix and grid requirements;
- optimising electricity flows across Europe;
- optimising decentralised energy systems (demand-side management, decentralised generation and storage, etc.) by integrating them into larger scale energy management systems;
- adapting the coordination of electricity systems in order to address a reduction in inertia of the electricity system in a context of increasing use of power electronics in order to factor in patterns of use and new production sources;

1.5.1.2 Climate transition

In the field of nuclear, hydro and fossil-fired power generation, EDF R&D is developing tools and methods to improve the safety of production resources, optimise their operational lifespan, and increase their performance in terms of output and environmental impact. There are three key priority goals: ensuring the Group maintains its advantage in terms of nuclear power over the long term, developing renewable energies while reducing their cost and increasing the extent to which they are used in electricity systems, while improving the environmental acceptability of our generation facilities.

1.5.1.2.1 Stronger, longer-lasting nuclear power production by EDF group, with few CO_2 emissions

1.5.1.2.1.1 For EDF

R&D is working to protect EDF's assets through actions in line with its policy to improve the safety of facilities, particularly with regard to enhanced performance and extended operating lifespan.

More broadly, the EDF group (EDF and Framatome) works on R&D with the CEA as part of the Institut Tripartite; this partnership was renewed in 2020. In 2017 the three partners launched the Nuclear Plan of Tomorrow Initiative comprising technological building blocks for existing plants and nuclear new build. This policy, already comprising 25 building blocks in 2020, is structured around digital technology, safety and risk management, materials, structures, and their manufacture. For instance, several technology building blocks aim to acquire and capitalise knowledge of the mechanisms involved in component ageing and its impact on the operating lifespan of EDF group nuclear units. Other building blocks are seeking to provide better modelling of threats to power plants such as earthquakes or fire in confined spaces, developing phenomenological approaches combined with large-scale digital simulation.

To support these programmes, R&D is developing digital simulation tools and experimental test resources, as well as tools that are capable of handling the fresh challenges raised by the increase in large sets of digital data, IT security, and new information and communication technologies.

In 2020, encouraged by the success of the ConnexLab experience, which aims to test out new operating and maintenance concepts, R&D launched the "Digital Reactor" project. This is noteworthy in the nuclear industry in that it brings together nine key partners (EDF, CEA, FRAMATOME, SMEs, MSEs, and academics) to develop innovative simulation products and services in the field of reactor physics.

The project will enable any operator to have a digital twin replicating its installation, allowing it to provide training in reactor operation. It also gives engineering departments and design firms working in the industry a computing environment based on the best available techniques, both in terms of available computing power and in terms of state-of-the-art scientific programming.

Furthermore, R&D contributes to the preliminary design of the Small Modular Reactor (SMR) reactor called Nuward.

1.5.1.2.1.2 For Framatome

In 2020, the accomplishments of the Technical and Engineering Division included:

- upgrading reactor justification software and methods used to prepare safety reports. Examples include neutron calculations of core power and analyses of thermal-hydraulic behaviour in the event of accidents;
- the new CATHARE 3 accident thermal-hydraulics software, as well as the advanced neutron simulation chain project ("ODYSSEE") carried out in partnership with EDF;
- designing primary reactor components. This R&D made advances in the areas of compliance with new regulatory requirements and the ability to justify the behaviour of equipment up to 60 years;
- using advanced learning methods to shorten the time required for studies.

Some of these developments have been in partnership with CEA, EDF, and the French Radiation protection and Nuclear Safety Institute (*Institut de radioprotection protection et de sûreté nucléaire, IRSN*).

Developments of the Installed Base Business Unit's service activities have resulted in significant progress: control of welding procedures, constant improvement in intervention equipment for PWR and BWR power plants, and the consolidation of an innovative digital product and service offering to enhance our customers' performance.

For the Projects and Components Business Unit, Framatome's Le Creusot plant continued its programme to ensure the reliability of low-alloy steel part manufacturing for the EPR2 Project, with full characterisation of demonstration parts made using new manufacturing processes in order to comply with the requirements of ESPN regulations. Carbon mapping of a high-tonnage ingot studied in partnership with Industeel should make it possible to adapt the forging of a primary steam generator base in 2021, without segregation.

The I&C Business Unit is continuing with the development of nuclear instrumentation and safety control products, in particular the next generation of high-security digital I&C, compatible with TELEPERM XS. This addresses the requirement for future I&C renovation projects, delivering major technological innovations in performance, compactness, robustness, and enhanced resistance to threats.

1.5.1.2.2 Support for the development of renewable energy, storage, and hydrogen

The second priority is support for the development of renewable energies in France and abroad, which play an increasingly important role in the European and global energy landscape.

For renewable energies, storage and hydrogen, the goal of R&D is to identify technological breakthroughs that offer a significant competitive advantage, and to help the most promising technologies emerge industrially, working in partnership with academia, industry and startups. EDF is investigating a wide range of renewable energies and storage solutions: hydropower, photovoltaics, onshore and offshore wind power, solar thermodynamic power, biomass, marine energies, geothermal power, electrochemical batteries, flywheels, flow cells, supercapacitors, electrolysers, fuel cells (hydrogen) and thermal energy storage (heat and cold).

For example, in the photovoltaic solar power field, EDF Renewables has launched innovative power plants that are currently undergoing experimental prototyping, such as agri-photovoltaic, floating photovoltaic or bifacial photovoltaic power plants. Tools for dimensioning and calculating specific photovoltaic production are generally developed in parallel. In addition, laboratory experiments allow us to understand the failure and degradation modes of these new technologies (photovoltaic cells, electrochemical batteries, electrolysers, wind turbine), whose technologies evolve regularly.

R&D is also working to develop tools and methods to enhance operational performance and optimise the cost of projects on electricity generation systems that are based on renewable energies, projects on storage and systems for hydrogen generation by electrolysis power by EDF group's low carbon electricity.

1.5.1.2.3 Environmental acceptability of facilities

The third priority is to improve the environmental acceptability of our production facilities. Climate change, the marked decline in biodiversity and Earth's limited resources make EDF a legitimate choice for a low carbon energy mix. The aim of the R&D Division's initiatives is:

- through its scientific and technical expertise, to contribute to the way in which the regulatory environment is evolving;
- to provide justification for our production facilities being on par with the best available techniques, at an economically acceptable cost, and to leverage these best available techniques in new projects;
- to acknowledge and manage our impact on terrestrial and aquatic environments, enhance the value of our improvement initiatives, limit and enhance the value of our sub-products;
- to know how to anticipate and address new developments in climate change, for example by becoming more familiar with the robustness of the heat sinks for power plants in light of future climate change; As well as to study how water resource availability may change in the future as a result of changes in climate and physical geography.
- to contribute to leveraging our positive actions with regard to local stakeholders.

Therefore, for many years, EDF has set up research teams dedicated to biodiversity issues. An ambitious research programme seeking to develop high-performance tools to assess and manage impacts on biodiversity is currently underway, delivering results that can be used immediately to acquire better scientific knowledge of the impacts of EDF production resources on biodiversity and constantly improve biodiversity around power production facilities.

1.5.1.3 Digital and societal transition

Digital transition impacts the entire electric power system and is a key driver of the electric and climate transitions described above. The information technology research programme focuses on:

- firstly, understanding and anticipating the impacts on the Group's businesses and the possible disruptions that may be caused by technologies such as artificial intelligence, the internet of things, 5G telephony, cyber security, blockchains, quantum computing, virtual reality, etc.;
- secondly, maintaining and developing a cross-disciplinary ecosystem of scientific computing to support the studies conducted by R&D and engineering.

2020 saw confirmation of the central role now played by AI in the programme: firstly, as a foundational technology allowing the value of the huge volume of data to be leveraged, and secondly, by being increasingly combined with other digital technologies such as cybersecurity (intrusion detection) and digital simulation (hybridisation of physical and statistical models, IoT, and blockchain).

Following on from the AI Manifesto for Industry (*Manifeste de l'IA pour l'industrie*), we launched a joint laboratory with Thales and Total devoted to AI, the goal of which is to develop methods suitable for our industrial challenges, in particular in relation to critical systems. An ambitious roadmap has been drawn up covering explainability, learning through reinforcement, and AI and simulation.

As in previous years, we have contributed extensively to the work done by Group Task Forces on breakthrough digital technologies: the AI Task Force, the IoT Task Force, and the Blockchain Task Force. It is important to note the dominant role of this programme in the incubation of a large number of use cases, in particular for production data transfer security and electricity origin traceability.

This year saw R&D entrusted with coordination of EDF's 5G Task Force, identifying 7 key use cases for group business lines on an experimental basis. R&D work is focusing on the 5G Living Lab, research into cybersecurity, and technology watch.

In terms of simulation, we have started an in-depth review of our software environment for simulation, devising a mechanical simulation platform that constitutes a new, more user-friendly and intuitive resource. The fruit of nearly 20 years of development, it draws a full benchmarking against leading market tools, allowing us to reinforce our strategy and focus on key modules for our studies.

To support digital transition, R&D is continuing to invest in powerful supercomputers with combined total nominal power of 15PFlops in 2021. They are vital for simulation studies of physics and for automatic learning modules for artificial intelligence.

More than ever, the various types of energy are also at the core of the challenges facing modern societies, with issues raised about its availability, its climatic, environmental, economic and geopolitical impacts, the resilience of energy systems, and access to energy for all. The goal to achieve energy transition by 2050 will require rapid shifts over the next 30 years in terms of uses, technical and industrial changes, and changes in lifestyles and consumption patterns. The challenge of carbon neutrality may cause unprecedented changes in the major systems that structure our lives. It is therefore essential to anticipate the societal and social consequences of these developments, in relation to the independent dynamics at work in society today. R&D develops specific tools to understand these societal issues and employs researchers in human and social sciences who work to understand these developments:

- the trends laboratory is an exploratory, multidisciplinary and collaborative system that focuses on societal trends and identifies areas to be monitored and issues that are the subject of debate for EDF group. Finally, it explores certain emerging or fundamental topics in greater depth;
- the Design Lab places the user experience at the core of its approach. It engages in various types of design (industrial, information, service, strategic) to develop industrial proposals and solutions;

- lastly, the close relationships that have been forged with the innovation ecosystem (startups, fab labs, etc.) make it possible to envision new joint innovation practices. In 2020, 45 partnerships were engaged with startups and innovative SMEs.

1.5.1.4 EDF's R&D partnerships internationally

To conduct its research and development programmes, EDF R&D develops a large number of partnerships both in France and worldwide, the purpose of which is to maintain its expertise at the highest global level in the disciplines central to EDF's concerns, and to supplement its internal reservoir of skills.

R&D's partnership policy is embodied in a variety of ways, both nationally and internationally.

In France, R&D has entered into framework agreements with major public research organisations. The main academic partner in France is the French national research agency (CNRS): EDF renewed for five years its partnership framework agreement with CNRS in 2019. Over the past few years, R&D has also set up about fifteen laboratories on a joint basis with academic partners and technical or industrial centres. With them, it is participating in collaborative research projects funded by several national or European desks. Each shared laboratory offers an opportunity to establish a combined team in order to focus on a common scientific and technical problem, with a view to creating value, expertise and knowledge for all partners; this constitutes a major asset when taking part in cooperative projects. In 2020, the joint laboratory convention 4EVLab, which brings together La Rochelle Université's Environmental Engineering Science Laboratory and CNRS to study building energy (building envelope, indoor air quality and energy efficiency, urban facilities and energy) was renewed. A new joint laboratory was also launched, bringing together EDF, Framatome and the Lyon National Institute of Applied Sciences (INSA) in the field of digital simulation of welding.

R&D also supports a few specially targeted teaching and research chairs.

R&D is also active within the Energy Transition Institutes (ITE), which have been set up pursuant to the Future Investments Programme, such as the Ile-de-France Photovoltaic Institute (IPVF), France Énergies Marines, which focuses on marine energies and offshore wind power, and Vedecom, which works on electric mobility.

EDF group is the driving force behind ConnexITy, an R&D programme aimed at connecting, through digital technology, players in the nuclear sector in order to simplify power plant operation, site preparation and design.

EDF is also a founding member of several European associations recognised at the EU level, such as Nugenia for nuclear power and EASE for storage.

Other developments include several partnerships within the Paris-Saclay campus ecosystem, including the SEISM Interest group on earthquakes, bringing together CentraleSupélec, ENS Paris-Saclay, CNRS, GRGM, EDF, and the Institute of Mechanical Science and Industrial Applications (Institut des sciences de la mécanique et applications industrielles, IMSIA) Joint Research Unit, bringing together ENSTA, CNRS, CEA, and EDF.

EDF's R&D has also set up the Materials Ageing Institute (MAI), an international research centre on materials ageing that brings together, alongside EDF, most of the world's major nuclear operators.

Internationally, since the early 2000s, EDF has had a research centre in Germany, EIFER, in collaboration with the Karlsruhe Institute of Technology (KIT). EIFER is the centre of reference for the hydrogen industry. In this respect it supports EDF group subsidiary Hynamics, dedicated to the commercial development of hydrogen solutions for industrial markets and heavy-duty mobility. EIFER teams are also fully engaged with topics relating to sustainable cities and territories, geothermal energy, and biofuels.

EDF R&D UK consolidates the Group's positions in the British research eco-system, particularly through Strathclyde University in the field of renewables, as well as with Manchester University, Imperial College, the National Nuclear Laboratory (NNL) and the University of Bristol in the field of nuclear energy. The centre provides direct support to the activities of EDF business units whether in the existing nuclear field (extension of AGR reactor lifespans, and decommissioning following EDF UK's announcement to shut down several reactors), or in new projects with the installation of an antenna in Bristol to support the HPC project and help solve its environmental problems. The centre is also fully mobilised, in digital solutions for clients and offshore wind farm projects for which it is the reference centre for all the Group's projects in France and abroad.

In Italy, Edison's Research, Development & Technological Innovation Division (RD&TI) provides medium to long-term support for strategy and, in the shorter term, informs the development of new services and offerings from Edison. More especially, Edison's R&D activity focuses on the following topics: smart homes and IoT, advanced photovoltaic cells, energy storage, and electric mobility (in particular, "vehicle-to-grid" and "vehicle-to-home" solutions). Staff and laboratories are located mainly on two sites, known as the *Officine Torino* and *Officine Milano*, situated in innovation spaces in the two Italian *Politecnici* (Milan and Turin), thus nurturing cooperation and firmly embedding Edison RD&TI in the world of innovation and research in Italy.

The Beijing centre is an asset in terms of participating in large-scale Chinese smart grid demonstration projects for smart grids (direct current, 5G), or nuclear facilities (see section 1.4.5.3.6.1 "Activities in China"). In 2020, with the support of R&D France departments, the centre made a major contribution to the launch of a new digital business by EDF China in partnership with Yuansuan. The centre also operates on areas such as sustainable cities and, more broadly, local multi-energy projects combining electricity, biomass and heating and cooling networks. It also provides support to the new renewable energy development entity established in China.

The United States R&D and innovation sector is one of the largest and most buoyant in the world. EDF group has had an R&D and Innovation center in Silicon Valley for several years, which supports its development in the USA and contributes to innovation in the Group. This laboratory's research areas include direct support to the subsidiary EDF Renewables North America, as well as the analysis, thanks to a dedicated team, of technological and digital trends, market design and the assessment of new business models for the Group in the USA.

Singapore's R&D centre mainly focuses on supporting the promotion and implementation of the Group's know-how concerning sustainable cities and marketing the various solutions of the Group. In 2020, the Singapore Lab focused more especially on the industrialisation of microgrid solutions at competitive prices using renewable energy, developed and tested with its demonstrator on Semakau island off the coast of Singapore.

1.5.2 Intellectual property

Intellectual property plays a major role in protecting the EDF group's technologies and know-how from competition, and in leveraging these assets through licensing agreements.

EDF is keen to strengthen its industrial property portfolio in order to make the most of its capacity for innovation and technological expertise. The portfolio is comprised of patents, registered software and formalised expertise.

Patents

At the end of 2020, EDF's and Enedis' portfolio comprised 716 patented innovations, protected by 2,103 property titles in France and abroad.

The strengthening of the patent portfolio is a priority. The aim of this is to facilitate R&D cooperation, protect the development of EDF's activities, contribute to EDF's external image, boost the motivation of researchers, and provide maximum leverage for inventions.

In 2020, EDF filed 66 patent applications [1] (61 in 2019).

Trademarks

"EDF" is a registered trademark in over 90 countries. The Group's name is a vital component of its image and its assets: the EDF brand, Internet domain names and logos are therefore constantly monitored, in order to protect them against any fraudulent use likely to jeopardise the Group's image. Moreover, following the work to enhance the status of the "EDF" brand, the Company has entered into brand licensing agreements with those of its subsidiaries that use the "EDF" brand.

The Group has also registered a large number of other trademarks, in particular those relating to the business of its various subsidiaries.

At the end of 2020, the EDF group's brand portfolio comprised some 558 names, protected by over 1,440 property titles, excluding the subsidiaries own portfolio.

(1) Enedis filed five patent applications.

EDF faces many challenges in a rapidly changing world. The Group is doing its utmost to meet these challenges and control the risks to which it is exposed.

EDF's business model is based in particular on economic and environmental performance, relying on business lines geared to energy transition, R&D and innovation. It is founded on a strong sense of human ambition and on the commitment of employees, who are called upon to maintain operational performance, in a safe and secure manner, while adapting activities, skills and working methods.

€16.2 billion	1	1.9	71%	70,000
2020 GROUP EBITDA	LEVEL 2 ESS (1)	GLOBAL LTIR (2)	OF EMPLOYEES TRAINED (3)	EMPLOYEES CONNECTED REMOTELY AT THE SAME TIME (4)

(1) In 2020 : ESS = Significant nuclear safety event on the INES scale.

(2) In 2020 : LTIR of EDF group and its providers.

(3) % of employees who took a skills development course in 2020 despite the health crisis.

(4) during the health crisis, demonstrating the resilience of the Information Systems.

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2

RISK FACTORS AND CONTROL FRAMEWORK

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Section 2.1 "Risk management and control of activities" describes the risk and activity control systems that apply to the entire Group.

Section 2.2 "Risks to which the Group is exposed" describes the most significant risks the Group believes it is exposed to, bearing in mind the Group' s specific characteristics.

2.1 Risk management and control of activities

This section presents the business control and risk management systems applicable to the entire Group for 2020. These systems, developed and implemented with due respect for the management independence of network infrastructure managers, are in line with the framework defined by the Group's policies. They also comply with the general principles set out in the AMF risk management and internal control reference framework (published on 22 July 2010). They are also based on developments in the main international reference frameworks, in particular COSO-2013.

2.1.1 Control environment

Framework: Group policy corpus

Since 2017, the EDF group has organised the control of activities and risks around the Group policies, validated and signed by the Executive Committee. This corpus defines all of the sustainable and cross-functional requirements to be implemented in all of the Group's entities and subsidiaries. Regular updates make it possible to adapt requirements to regulatory changes and strategic orientations. A review of Group policies with regard to the *raison d'être* was undertaken in 2020.

Control system objectives

The system for controlling the risks and activities of the Group, defined in the "Functioning principles/Risk management and internal control" policy aims to:

- identify and periodically reassess the significant risks and opportunities likely to impact the targets of the Group, in order to ensure the existence and control of relevant and effective action plans;
- constantly ensure:
  - compliance with laws and regulations, including those relating to the management independence of network infrastructure managers,
  - the smooth running of processes and projects;
  - the reliability of financial and non-financial information;
  - compliance with Group policies;
  - and the control of risks and activities of any kind.

Principles of execution

The fundamental principles of execution are based on the three lines of control model:

- 1st line of control: each manager at all levels is responsible for: identifying and controlling the main risks related to their activities, ensuring this control for the missions that they themselves have entrusted to their employees, to ensure that the control systems are appropriate and proportionate to the risks identified, and to report on them formally and regularly to their own manager through self-assessments;
- 2nd control line: the support functions define common requirements for the Group and supervise their control. Their contribution to the control of the Group's activities is set out in section 2.1.2. Amongst them, the risk and internal-control functions organise the overall control measures and prepare reports intended for the Group's governing bodies;
- 3rd control line: the independent audit system can check the appropriateness and effectiveness of the measures for managing the risks and activities of the Group's entities, check management of the main cross-functional processes and major projects of the Group, and more generally, check the level of control of the Group's risks (see section 2.1.3).

All of these measures based on the three control lines provide the managers and governing bodies of the Group with "reasonable assurance" concerning the identification and coverage of the main risks.

1st line	54 operating entities	• Meet the requirements of the Group' s set of 40 policies • Implement 1st level controls adapted to their risks and issues • Carry out an annual risk mapping and self-assessment of their risk management system • Implement progress and risk treatment action plans
2nd line	Functional Support Departments*	• Define and update the Group' s 40 policies • Define the control and self-assessment sheets in their field for the operational entities / first line of control • Implement 2nd level controls organised within their functions • Analyse the reliability of entity self-assessments • Coordinate the progress and risk management action plans of their function
3rd line	Internal Audit (see 2.1.3)	• Independently assess the entire system • Make recommendations to be incorporated by entities as improvement initiatives • Provide the governance bodies with reasonable assurance that the system as a whole is effective (incorporating in particular the 1st and 2nd lines)

* Group policies, implemented by the functional departments of the second line of control, cover the following areas: procurement and contract management, communication – institutional relations – partnerships, sustainable development, ethics and compliance, finance and markets, crisis management and business continuity, data management, real estate, legal affairs, project management, human resources, internal control, general services, safety and security of assets, information systems.

Scope

With regard to the scope of control (excluding subsidiaries managing regulated infrastructures), these purposes and principles are implemented by the entities or subsidiaries, who themselves ensure their implementation in the entities or subsidiaries they control.

With regards to the other subsidiaries of the Group (subsidiaries that are operators of regulated infrastructure and significant shareholdings), EDF representatives within the governing bodies make sure that a system for controlling activities and risks is put in place. They provide regular information on the map of risks and internal control and audit activities (programme and main results). They can also check the effectiveness and appropriateness of each of these measures through a periodic audit of the respective entities. The applicable principles are adapted for the operators of regulated infrastructure to ensure compliance with obligations related to their management independence.

The management bodies

The organisation of the Executive Management of EDF is described in section 4.3.1. "Members of the Executive Committee". Each member of the Executive Committee is responsible for implementing all actions necessary to controlling the risks within their scope.

Risk Committee

The Executive Committee meets at least twice a year as a Risk Committee, during which it examines in particular the mapping of Group risks, the assessment of internal control activities and audit activities (annual programme, results). It identifies the priority risks for the Group, shares their strategy for mitigation and designates the members of the Executive Committee who are its sponsors.

The Group Executive Committee Commitments Committee

To strengthen the appraisal and monitoring of projects, the Group Executive Committee Commitments Committee (CECEG) [1] thoroughly examines the most significant projects in terms of the extent of the commitments and/or the risks incurred before decisions are made by the Executive Committee (see section 2.1.2.3 "Approval of commitments").

2.1.2 Focus on the 2nd line of control: cross-functional control systems

The second line is made up of all the functional departments, which are responsible for leading and coordinating the implementation of the Group's policies within their remit. The focus is specifically on the following cross-functional control systems: risk mapping and operations and risk management report, ethics and compliance programme, approval of commitments, reliability of financial information, crisis management and business continuity, insurance, etc.

Please note: aspects relating to the Group's human resources, including in particular the control of risks relating to the health and safety of employees and service providers, are set out in detail in section 3.3.1.3 "Health and safety of employees and subcontractors" of the Universal Registration Document.

2.1.2.1 Risk mapping and the report on the control of activities and risks

Report on the control of the activities and risks of the entities

Each Group entity (54 entities in 2020 covering the scope of EDF and controlled subsidiaries) prepares an annual report on the control of its activities and risks based on a self-assessment, including a description of its improvement actions. Each report gives rise to a commitment signed by the Director of the entity on the level of control achieved and the actions undertaken.

The report includes in particular internal control, the report on the safeguarding of assets and the ethics and compliance report.

The ethics and compliance section meets the requirements of the Group Ethics and Compliance policy, including: the ethics alert system, prevention of the risk of corruption (monitoring the integrity of business relations, managing gifts and invitations); financial ethics (prevention of the risk of money laundering and financing of terrorism, prevention of market abuse, and compliance with the EMIR regulation [2]); prevention of breaches of competition law; prevention of conflicts of interest; compliance with personal data protection rules; combating fraud; combating harassment and discrimination; due diligence; compliance with sector-specific regulations (REMIT regulation [3] on integrity and transparency of energy markets, regulations on dual-use goods); compliance with international sanctions programmes.

The part relating to security of assets fulfils the requirements of the Security of Assets against Malicious Acts Group policy, including: the safety of individuals during international travel, the security of material assets and the security of intangible assets (identification, classification and protection of sensitive information).

In addition to these topics, entity self-assessments more generally report on the control of all their "business line" activities and all the requirements of the other cross-functional areas identified in Group policies, in line with their risk mapping.

Finally, the self-assessments report on the control of the requirements relating to accounting and financial internal control, in line with the AMF framework (see section 2.1.2.4 "Reliability of financial information, accounting and financial controls, organisation of financial risk management").

Entity risk mapping

The entities produce an annual risk map based on a methodology common to the entire Group. The process of constructing the risk map for the entities is based on:

- the principle of management accountability discussed in section 2.1.1 "Control Environment";
- a typology of risks, including internal or external risks and operational or strategic risks, as well as opportunities;
- a qualitative evaluation method of the impact, the probability and the level of control of each risk;
- the description of action plans for dealing with risks and the evaluation of their effectiveness.

Numerous discussions have taken place between the Group Risk Division and the entities, with the aim of querying the relevance of risks and the soundness of the control actions undertaken.

(1) The composition of the Group Executive Committee Commitments Committee is the same as that of the Executive Committee.
(2) European Market Infrastructure regulation (EMIR): European regulation on market infrastructures.
(3) Regulation on Wholesale Energy Market Integrity and Transparency (REMIT): European regulation on the interity and transparency of wholesale energy markets.

Methods and tools: Several methodological documents and tools are made available to the entities to support risk and internal control approaches:

- a risk analysis methodological guide and a software package (SIGR – Risk management Information System) to support entity risk maps;
- an internal control guide, a detailed self-assessment framework and a digital platform for sharing and summarising self-assessments (Internal Control Information System).

Group risk mapping

On the basis of these reports, supplemented by a cross review with the Internal Audit Department, the EDF group Risk Department draws up the consolidated mapping of its major risks, including the overall assessment of internal control and providing Management and governance bodies with a consolidated and regularly updated view of the major risks and their level of control [(1)]. These documents are validated by the Risk Committee and are presented to the Board of Directors after examination by the Audit Committee.

In October 2020, a version of the complementary risk mapping was presented to the Risk Committee, integrating elements related to the Covid crisis.

The Risk Committee identifies, within the Group risk mapping, a smaller set of "priority risks" selected as a result of their operational or strategic importance.

2.1.2.2 The Group Ethics and Compliance program

The Group Ethics and Compliance Department implements the Group Ethics and Compliance programme on the basis of the following reference frameworks (see section 3.3.2 "Ethics, compliance and human rights"):

- the Group Ethics and Compliance Policy (PECG), validated by the Executive Committee on 17 May 2016 and reviewed in 2020, which compiles the main rules that Managers must know, respect and ensure compliance within their entities, in strict accordance with the risks of these entities. The PECG is backed up by instruction notes and support guides designed to assist its deployment, including in particular monitoring the integrity of business relations, financial ethics, protection of personal data, the fight against fraud, the management of gifts and invitations and the prevention of conflicts of interest. The PECG is the supra-reference to the Group Ethics Charter and the Ethics and Compliance Code of Conduct, which can be updated according to new applicable regulations and is subject to audit;
- the Group Ethics Charter built around the Group's three values (Respect, Solidarity, Responsibility), which defines the requirements that should guide the actions and conduct of the Group employees on a daily basis. An updated version of the Charter, which dates from 2013, has been rolled out throughout the Group as of March 2019;
- the Code of Ethical Conduct and Compliance published on 1st June 2017 and set out in the internal regulations of the entities, which constitutes the Universal Registration Document for the prevention of corruption and applies to all employees (requirements of the Sapin II Law). An updated version of the code of conduct is currently being discussed with employee representative bodies with a view to it coming into force in 2021;
- the EDF group ethics and compliance whistleblowing system, which allows employees and external collaborators (temporary staff, employees of a service provider, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.) of the Group, to make a report in accordance with the "Sapin II" Law of 9 December 2016, relating to transparency, the fight against corruption and the modernisation of economic life (see section 3.3.2.4 "Whistleblowing system"). The same alert system is also made available to third parties for issues covered by the "Due Diligence" Act of 27 March 2017 relating to the due diligence obligations of parent companies and ordering companies.

2.1.2.3 Approval of commitments

The EDF group's Commitments policy sets the framework for commitment decisions in terms of steering, governance and control. This policy applies to all commitment projects, regardless of their amount, for all EDF entities and subsidiaries, excluding regulated subsidiaries while respecting the governance of listed companies. Before each commitment decision, the proposed projects undergo a risk analysis according to a methodological reference framework made available to the entire Group. Strategic projects (beyond the thresholds defined in the Commitments policy) are reviewed by the Group Executive Committee Commitments Committee (CECEG).

Draft commitments are reviewed, where appropriate, by the Board of Directors as described in sections 4.2.2.3 "Powers and duties of the Board of Directors" and 4.2.2.8 "Activity of the Board of Directors in 2020".

Strategic disposal projects are investigated separately and supervised by the Disposals Committee (part of the CECEG) to preserve confidentiality and responsiveness.

2.1.2.4 Reliability of financial information – internal accounting and financial controls – Organisation of financial risk management

The EDF group has organised its financial risk management around the following functions:

- **Performance Management, reporting**, tasked with:
  - contributing to the management of the performance of the Group's entities by helping define the Group's performance plans and by challenging the measures implemented by the entities and business lines. For this purpose, the Finance Department implements a set of management indicators adapted to the economic model of each of the Group's activities;
  - contributing to budget monitoring through general performance reviews in the departments and controlled subsidiaries;
  - developing and disseminating financial management methods and processes, contributing to the dissemination of management culture within the Group;
  - managing the management cycle processes, summarising them and suggesting decisions to departments and subsidiaries;
  - developing medium- and long-term financial trajectories.
- **Accountancy:**
  - preparing EDF's financial statements and the Group's consolidated financial statements;
  - ensuring accounting compliance through Group reference frameworks based on accounting standards and the chart of accounts;
  - coordinating the Group's internal accounting and financial control system, in accordance with the system presented below.
- **Taxation:**
  - ensuring the consistency of tax practices, the requirements of which are listed in the Group's Tax policy. The precise provisions in this area are discussed in section 3.4.2.2 "Contribution to development through taxation" of this document;
  - ensuring the proper implementation of legal and declarative obligations, notably by monitoring the subject;
  - ensuring the accounting follow-up of the deferred tax position and the periodic justification of the accounts;
  - identifying and controlling the Group's tax risks.
- **Finance and Investments:**
  - coordinating all the actions inherent in the Group's balance sheet and financial result, with the aim in particular of controlling the exposure of the Group's hedging assets, debt and the Group's overall balance sheet to financial risks;

(1) Group risk mapping notably includes environmental risks and risks related to climate change (physical risks and transition risks). These risks are described in section 2.2 "Risks to which the Group is exposed"; the strategic response to the challenges of climate change is described in section 3.1 "Carbon neutrality and the climate".

- managing the investments and acquisitions and disposals as well as the listed or unlisted dedicated assets. The Group Risk Division prepares an annual risk mandate and specific working frameworks which define the principles for managing risks and the risk limits that are acceptable for this portfolio;
- appraising the investment projects presented to the CECEG meetings to anticipate impacts and improve the reliability of the financial trajectories on the Group's balance sheet and profit and loss accounts, as defined by the Commitments policy;
- contribute to portfolio reviews and economic and financial optimisation analyses;
- ensuring that the Group is financed in accordance with the Financing, Treasury and Financial Risk Management policy; verifying the proper application of the policy's principles (drafting of frameworks, methodology, monitoring of exposures, regular calculation of risk indicators and checking that risk limits are complied with). The positions of the trading room in charge of cash management are monitored by the Group Risk Management Department.

The policy on Financing, Treasury and Financial Risk Management requires all entities of the Group to continuously and systematically identify financial risks (in particular, liquidity, interest rates, foreign exchange and counterparty). The Group Risk Department exercises 2nd level control of these risks *via*:

- verification that the principles of the policy have been properly applied (preparing work management frameworks, methodology, monitoring exposures, regular calculation of risk indicators and checking compliance with risk limits);
- the control of positions in the trading room in charge of cash management. For these activities, a system of indicators and risk limits checked on a daily and a weekly basis is in place. The Markets Committee (a body that brings together the Finance and Investment Department and the Group Risk Department) checks and reviews on a quarterly basis, where necessary, requests for exemptions to the work management framework and requests for investment in new financial products.

The policy on the constitution, management and control of the financial risks involving Dedicated Assets of EDF applies to the portfolio of dedicated assets which are managed by the Financial Department. The Group Risk Department prepares an annual risk mandate and specific working frameworks which define the principles for managing risks and the risk limits that are acceptable for this portfolio.

Reference frameworks

The accounting standards used by the EDF group (the scope of the Group's consolidated financial statements are included in the appendix to the consolidated financial statements (see section 6 "Financial statements") comply with the international standards published by the International Accounting Standards Board ("IASB") approved by the European Union and applicable as at 31 December 2020. These international standards include the IAS (International Accounting Standards), IFRS (International Financial Reporting Standards) and the SIC and IFRIC interpretations. The accounting rules and methods are specified in the Group's accounting principles manual and summarised in the notes to the consolidated financial statements.

The principles applicable to the preparation and reporting to the Group's Finance Department are defined in the Accounting and Financial Reporting policy. The specific internal control provisions are described in the Group guideline entitled "Accounting and Financial Internal Control", and the control objectives to be implemented in the entities are specified and updated each year in the Group's Internal Control Guide. The Finance Management Directors of the Departments of the Business Lines and Subsidiaries sit on the Management Committee of the entities to which they belong. With the exception of the operators of regulated infrastructure, they are appointed and evaluated jointly by operational management and the management of the Finance function. A network of correspondents from the Operational Departments and subsidiaries facilitates dissemination of the instructions and harmonised implementation throughout the various Group entities.

Each EDF operational and functional Director makes a commitment each year with regard to the quality of the Internal Control system in the Accounting and Financial areas, the improvement goals for the coming period and the truthfulness and exhaustiveness of the accounting information for which they are responsible by preparing a commitment letter sent to the Group Accounting and Tax Director. In return, each Director receives a letter of appreciation of accounting and tax quality from the Group's Accounting and Tax Director based on the various elements of assessment (results of internal controls, indicators of the accounting quality dashboard, letter certifying the compliance of the CSP2C accounts, specific actions) to highlight the progress made and determine the improvement actions to be undertaken or continued. An indicator reference framework is used within EDF. It makes it possible to measure areas of conformity of the accounting information for each process. With regard to subsidiaries, each legal entity is responsible for the implementation of the Group's Accounting and Financial Internal Control Directive.

Procedures for preparing and controlling the consolidated financial statements

The consolidated financial statements are prepared by the Consolidation Department of the Consolidation Accounting Division on the basis of data entered locally by each entity (parent company entities and subsidiaries) in accordance with Group standards and closing instructions, following a single chart of accounts. The scope of consolidation is closed after noting all companies of significance that are controlled, jointly-controlled or under significant influence. The non-significant nature of entities for which EDF holds an interest and which might fall within the scope of consolidation is examined regularly and submitted annually for the assessment of the Statutory Auditors.

The half-year consolidated financial statements are presented to the Audit Committee and then approved by the Board of Directors. The annual consolidated financial statements are reviewed by the Audit Committee, then closed at 31 December of the fiscal year by the Board of Directors and lastly approved by the Shareholders' Meeting.

Each half-yearly and annual closing gives rise to the preparation of instructions specifying the main deliverables expected from each party involved in the publication of the financial statements as well as the preparation of the management report and the Universal Registration Document (URD) for the annual financial statements. Meetings with EDF departments and the subsidiaries facilitate the preparation of these financial statements and make it possible to anticipate changes with regard to certain treatments thereby increasing the reliability of the accounting and financial information published. An analysis of the conditions of preparation (compliance with deadlines, quality of information, etc.) after the event allows for regular improvement of the consolidated financial statements preparation and analysis process.

Quaterly reporting of information on the EDF group balance sheet accounts and the income statement can anticipate the processing of complex operations and contribute to making the results more reliable.

Forecasts and management acts are implemented using a single reference framework and tools shared between accounting and management. This system contributes to the coherence of Group management and facilitates dialogue at all levels of the organisation and helps promote exchange of information between actors and the quality of the information produced.

Procedures for preparing and auditing the corporate financial statements

The corporate financial statements are prepared annually and semi-annually by the Parent Company Financial Statements Department of the Accounting Consolidation Division. The annual corporate financial statements are closed on 31 December of the fiscal year, approved by the Board of Directors of EDF and then approved by the Shareholders' Meeting.

The condensed half-year corporate financial statements are closed on 30 June of the fiscal year by the Board of Directors. EDF's transactional accounting (excluding the Nuclear Fuel Division, the Insular Energy Systems Division, the Decommissioning and Waste Projects Division and the Executive Talents Training Managers Department for the payroll accounting aspect) is entrusted to the Shared Accounting and Consulting Services Center (CSP2C) of the Tertiary Services Department, which also handles the transactional accounting for certain French subsidiaries. The treatment of transactional accounting is organised by process. "Governance pacts" set the respective responsibilities of the Operational and Functional Departments, of the CSP2C or, where applicable, the accounting operators in the operational business lines and the Accounting Consolidation Division.

Meetings are organised on a quarterly basis with the EDF departments to prepare the financial statements and anticipate changes with regard to certain treatments to increase the reliability of the accounting and financial information published.

2.1.2.5 Crisis management and business continuity – The example of the Covid-19 crisis

Like the Covid-19 pandemics, natural disasters (floods, landslides, earthquakes, etc.), significant climatic variations (droughts, etc.) or any other event the scope of which is difficult to predict (pandemic, major industrial accident in the world, etc.) could affect the Group's activities; this was the case with the storms Klaus (2009), Xynthia (2010), Amelie (2019), Alex (2020) in metropolitan France, or Irma (2017) in the West Indies, or with episodes of extreme cold (winter 2017) or heat waves (summer 2019). In the event of an exceptional incident, the measures adopted may generate costs beyond those of repairing the damage caused by the disaster and the loss of earnings from the interruption of the goods and services provided by the Group.

To meet this risk, EDF has defined a crisis management policy that takes into account the Group's territorial presence and the importance of the Group's industrial and public service business in the economy. This "Crisis-Management and Business-Continuity policy" defines the organisation principles and specifies the entire system necessary to its implementation. This policy consists in particular of:

- making sure of the existence of organisations for crisis management and permanent systems for raising alerts;
- checking the existence and regular update of relevant crisis-management procedures, with regard to the risks involved;
- defining, for periods of crisis, coordination procedures with all stakeholders;
- ensuring feedback from crises and crisis exercises is systematically applied in order to avoid or reduce the consequences of similar crisis;
- checking the existence and update of business continuity plans within each entity;
- checking the implementation of professional development actions for all players in the crisis.

A crisis exercise programme allows these mechanisms to be tested in terms of their effectiveness and overall consistency.

In 2019, the EDF group set up an action plan to increase the entities' preparedness with regard to business continuity issues: in this context, the development of a pandemic crisis exercise, including the revision of the EDF group's pandemic plan, was initiated in the summer of 2019. This work proved to be particularly useful for the management of the Covid crisis in 2020: relying on operational, preparedness and training measures, the EDF group was able to face, proactively and with foresight, the health crisis as from the end of January 2020.

Feedback after the summer of 2020 enabled the Group to approach the second lockdown with the lessons needed to continue its activity.

Lastly, to prepare for possible consequences of the Covid crisis on the supply/demand balance during the winter of 2020/2021, the EDF group took part in the preparation and implementation, in October 2020, of an "Extreme Cold" crisis exercise organised by the French Ministry of Ecological Transition and Solidarity.

2.1.2.6 Insurance

In order to protect its assets and limit the impact of certain events on its financial position, the EDF group has dedicated insurance programmes that cover its major risks in terms of property damage, civil liability and insurance of persons. Nuclear risks are subject to the specific civil liability regime described below.

Organisation

The Group Insurance Division is responsible, while respecting the management independence of the regulated infrastructure operators, for preparing the insurance policy of the EDF group and organising its implementation throughout the Group, in order to continuously optimise the overall costs of its insurable risks [(1)].

Its duties are to:

- continuously analyse cover for the EDF group's risks in conjunction with the Group Risk Department: analysis by business line, entity and project;
- establish rules for the Group's entire scope that enable covering all risks that can and must be covered, as well as optimising the total cost thereof and managing volatility;
- promote and apply these rules to all Group entities, using appropriate means and in compliance with governance rules;
- develop and monitor the tools necessary to perform the above tasks, including within the subsidiaries reporting to the Insurance Division: EDF Assurances and the Group's captive insurance companies.

The Insurance Managers of entities and controlled subsidiaries that join the Group's programmes are responsible for:

- ensuring that all risks are insured;
- scheduling prevention inspections and overseeing implementation of the resulting recommendations;
- reviewing cover strategies and amounts declared (risk quantification);
- analysing losses and participating in claims handling.

This work, carried out in close collaboration with the Group Insurance Division, makes it possible to continuously improve the quality of information on insurable risks as programmes are renewed and prevention visits are carried out (assessment of maximum possible claims, "SMP"). In connection with prevention actions, the Group Insurance Division establishes and oversees implementation of the site inspections programmes.

We are continuing to integrate Framatome into the Group's insurance programmes with a view to improving the coverage offered and achieving financial synergies. Framatome offers civil liability insurance for corporate officers, property and casualty insurance (not including nuclear assets), Cyber risk insurance, motor vehicle risk insurance, and nuclear operator's civil liability insurance and related transport insurance, which has been included in the Group's programmes since 18 February 2020.

Group Insurance Policies

Purpose: the Insurance policy, validated by the Executive Committee in January 2017, specifies the risks that the Group decides to transfer to the market and the general principles for optimising these transfers: mass purchasing through the implementation of Group insurance programmes, sharing between traditional markets and other types of cover (specialised mutual insurance companies, transfer to the financial markets, etc.), individual and Group deductibles (generally, only large-scale risks are transferred) and optimisation of intermediation expenses.

Implementation methods: since 2004, an update on the situation and costs of covering EDF's risks through insurance or the transfer of risks to the financial markets has been presented to the Audit Committee. The Audit Committee therefore receives regular updates on insurance and a review of the insurability of Group risks.

Since 2011, a Strategic Insurance Policy Committee ("COSA"), currently chaired by the Finance and Investments Director, provides an opportunity for the business lines and the Finance Department to reflect on changes to and procedures for implementing the Insurance policy, in particular the main characteristics of the programmes.

The Group Insurance Division and the Group Risk Department produce an annual analysis of the risk mapping at Group level, supplemented by the insurance coverage system in place. Based on this shared view, EDF is in a position to improve, and, where necessary, extend the coverage of insurable risks in accordance with the principles established by the Group in this area.

The goal of the Group's insurance programmes is to integrate the controlled subsidiaries as broadly as possible, in order to homogenise risk coverage and streamline its management, on the one hand, and to control the corresponding insurance costs, on the other hand.

Insurance contracts, according to market practice, include exclusions, limits and sub-limits.

(1) Risks that can be transferred to the insurance markets and the alternative markets.

Use of captive insurance companies and mutual insurance companies

Like all major French and international groups, EDF uses captive insurance companies and mutual insurance companies to supplement coverage provided by the traditional insurance markets.

The EDF's captive insurance companies are:

- Wagram Insurance Company DAC, an insurance company founded in 2003 in Dublin, which is involved in the majority of the Group's insurance programmes;
- Océane Re, a reinsurance company established in 2003 in Luxembourg, to reinsure EDF's nuclear civil liability risk.

It should be noted that Framatome also has had a reinsurance company (Tereco) in Luxembourg since 21 December 2018.

Furthermore, EDF is a member of the Oil Insurance Limited (OIL) mutual insurance company in order to deal with the risks of damage (excluding overhead networks) to the property owned by the Group or under concession (EDF and its consolidated subsidiaries). OIL is an insurance mutual company which provides its members with cover for property damage. The scope covered includes *inter alia* nuclear power plants (the conventional portion), fossil fuel-fired power plants, hydropower facilities, network substations and exploration and production assets.

The Group's damage insurance programmes combine this cover provided by OIL and covers provided by market insurers.

The EDF group is also a member of the European Liability Insurance for the Nuclear Industry (ELINI), the European Mutual Association for Nuclear Insurance (EMANI), the Nuclear Industry Reinsurance Association (NIRA) and Blue Re, which are mutual insurance companies that manage cover in this field for European nuclear power operators.

The captive and mutual insurance companies enable EDF to reduce the total amount of premiums paid and, more generally, the cost of its insurance schemes.

Civil liability insurance (not including nuclear civil liability)

EDF has taken out a general civil liability insurance program covering EDF, Enedis and their controlled subsidiaries against the financial consequences of civil liability, excluding nuclear damage, that may be incurred by the entities in the course of their activities due to damage caused to third parties. In particular, this programme covers the risks of civil liability associated with the operation of structures (hydroelectric dams, fossil fuel-fired power plants, substations and other network facilities), risks associated with development of the Group's renewable energy activities (wind, solar, etc.), as well as risks associated with environmental damage (emissions of solid, liquid or gaseous substances).

The actions and measures implemented to prevent industrial and environmental risks and limit their effects are described in particular in section 2.1.2 "Focus on the 2nd line of control: cross-functional control systems".

This cover is purchased to the extent of available capacity under acceptable financial terms on the insurance and reinsurance markets. Maximum cover is €1 billion. Under this programme, the share of risk retained by the Group with regard to an insurable accident ("retention"), including the share of Wagram Insurance Company DAC and Océane Re, does not exceed €40 million per insurable accident. Subsidiaries generally opt for lower deductibles that are more consistent with their financial capacity.

Civil liability insurance for corporate officers

EDF holds civil liability insurance covering corporate officers and Directors of EDF, Enedis and their controlled subsidiaries against the financial consequences of their civil liability incurred in performing their management functions.

Damage insurance (excluding nuclear assets)

Conventional damage programme

The scope of the conventional damage programme includes virtually all EDF subsidiaries, in particular EDF Energy, Edison, Dalkia and the distribution network operator Enedis.

Wagram Insurance Company DAC, the Group's captive insurance company, together with other insurers and reinsurers, provide extensions of cover (property damage and business interruption) in addition to the covers provided by OIL, bringing the maximum up to €1 billion.

Under this programme, the Group's retention per claim, including the deductible (which varies by subsidiary) and the share of the risk retained by Wagram Insurance Company DAC and by Océane Re, does not exceed €15 million.

This programme provides cover for business interruption for most subsidiaries in the event of property damage, but not for EDF, which does not benefit from this cover. The actions and measures implemented to prevent industrial and environmental risks and limit their effects are described in particular in section 2.1.2 "Focus on the 2nd line of control: cross-functional control systems".

Cover for "construction" risks

EDF has taken out insurance policies covering specific construction risks (construction all-risk and erection/testing all-risk policies). These policies are not included in any Group programme but are purchased on an *ad hoc* basis for major construction projects such as the EPRs of Flamanville and Hinkley Point C, the construction of combined cycle power plants, dams, etc.

These covers are specifically monitored and are renegotiated if unforeseen events occur during the construction projects.

Storm coverage

In connection with the renewal of the storm insurance coverage, Enedis signed with Swiss Re on 27 June 2016 a parametric insurance contract covering the aerial transmission network against the consequences of exceptional storms.

With a term of five years and total cover of €275 million, this innovative insurance contract triggers, in the event of a claim, parametric compensation based on a composite index for wind speeds recorded by Météo-France stations weighted by the vulnerability of the distribution network in each region of the Enedis concession area.

The overhead networks of the Island Energy Systems, for their part, do not benefit from "property damage" coverage, except within a radius of 1,000 m around the production units.

Cyber risk cover

Since 1 July 2017, cyber risk cover has been put in place. The €100 million coverage policy underwritten for two years covers all EDF entities and the subsidiaries of the Group. This coverage was renewed on 1 July 2019.

Its purpose is to cover the expenses incurred to handle major disruptions caused by a cyber-attack against the Group's information systems.

Specific insurance for nuclear facility operations

Civil liability of nuclear facility operators

Several international conventions govern the civil liability of nuclear facility operators, in particular the Paris Convention of 29 July 1960 on Third-Party Liability in the Field of Nuclear Energy and the Brussels Convention of 31 January 1963, which supplements the Paris Convention (hereinafter the "Conventions"). The Paris Convention introduced a special liability system for nuclear damage, which is strict (even in the absence of fault), limited in terms of the amount [1] and duration, and is exclusively focused on the operator of the nuclear facility. These Conventions apply to the signatory countries that have ratified them, including France and the United Kingdom.

(1) With the exception of country Parties that have opted for unlimited liability (Germany, Switzerland, Sweden, etc.).

Protocols to amend the Paris and Brussels Conventions were signed on 12 February 2004 but have still not entered into force. Ratification and entry into force of the revised Conventions is currently scheduled for 3 January 2022. They require higher amounts of compensation than the original conventions, in order to cover a greater number of victims and types of damage that are eligible for indemnification. The State in which the nuclear facility of the operator that is liable for causing the damage is located is liable for amounts above the €700 million for which the operator is liable, up to €1,200 million (provided that said State is a Contracting State of the Brussels Convention). Over and above this amount, the Contracting States of the Brussels Convention are liable up to a maximum amount of €1,500 million. In addition, for personal injury only, the time limit to claim compensation has changed from 10 years to 30 years from the date of the incident. The definition of "nuclear damage" is evolving and includes, in addition to damages to persons and property, economic losses, the cost of protective measures, the cost of measures to rehabilitate damaged environments, and certain other losses resulting from damage to the environment.

These Conventions also provide that the operator has an obligation to take out insurance or lodge a financial guarantee for the liability amounts established in order to guarantee the availability of funds.

In France, the civil liability obligations imposed on nuclear facility operators were transposed into the French Environmental Code.

More specifically, since 2016, Articles L. 597-28 and L. 597-32 of the French Environmental Code provide that the limits on the civil liability of nuclear operators are set at €700 million for nuclear installations (€70 million for low-risk installations) and €80 million for risks during transport.

EDF has a "Nuclear Civil Liability Insurance Programme (RCN)" insurance cover obtained following a call for tenders, which enables the Group to meet its obligations while controlling their financial impact. The insurance is shared between the nuclear insurance market (AXA, reinsured by the French nuclear pool Assuratome), the Group's captive insurance companies, and the nuclear mutual insurance company ELINI.

In view of probable changes to nuclear operators' obligations during this period (particularly following the application of protocols amending the Paris and Brussels Conventions), withdrawal clauses were included in the contract.

Framatome joined the Group's insurance system on 18 February 2020. Its insurance programme is equally divided between the nuclear insurance market (AXA, reinsured by Assuratome), the Group's captives and the ELINI nuclear mutual insurance company.

In the United Kingdom, where EDF Energy operates nuclear power plants, the nuclear operator's civil liability rules are similar to French rules. The UK Parliament approved on 4 May 2016 the "Nuclear Installations Order" (order transposing the above-mentioned amending Protocols of February 2004), which makes substantially the same changes as the French TSN Act in 2006 but which, for the most part, shall enter into force only in conjunction with the Protocols.

This Order will raise the British operators' obligations from the current limit of £140 million to the equivalent of €700 million, and they will be progressively increased over a five-year period to reach a cap of €1.2 billion.

EDF Energy is currently insured by ELINI and Wagram Insurance Company DAC. The reinsurance company Océane Re shares in this risk under the reinsurance contract it issues for the benefit of Wagram Insurance Company DAC.

Furthermore, the Conventions provide that for Contracting States, over and above the maximum amount for which the operator is liable, the State in which the incident occurred is responsible for compensating victims up to a maximum of €217.4 million; over and above this amount, Member States that have ratified the Brussels Convention contribute collectively to compensation up to a limit of €372.6 million.

Civil liability for transport of nuclear substances

Under the Paris Convention, the operator that is the "shipper" is civilly liable for transport of nuclear substances (unless stipulated otherwise). Since 18 February 2016, the liability ceiling has been set at €80 million with an unchanged scope of damage, and will subsequently be extended to a broader scope of damage admissible for compensation when the revised Paris Convention comes into force. This liability is as of now covered by the aforementioned nuclear operator civil liability policy.

Cover for damage to nuclear facilities

The cover obtained through EDF's membership in the OIL mutual insurance company provides protection against material damage in cold areas, excluding the consequences of a nuclear accident, of 60% of $400 million in excess of a deductible of $15 million, both in France and the United Kingdom.

Since 1st October 2018, the insurance system covering nuclear installations has been revised as follows:

- in France, the protection provided by OIL is supplemented, for the consequences of a nuclear accident, including the cost of decontaminating the site, by an insurance coverage of €90 million in excess of a deductible of €10 million using the EMANI nuclear mutual insurance company, Axa and Allianz (reinsured by Assuratome), and Wagram Insurance Company DAC (reinsured by Océane Re);
- in the United Kingdom, OIL protection is supplemented for the consequences of a nuclear accident, including site decontamination costs, by an insurance programme with a total capacity of €1,510 million, exceeding an amount of €240 million provided by the EMANI nuclear mutual insurance company, the British nuclear pool NRI and Northcourt, which includes specialised British insurers.

Framatome is insured with the Mutuelle EMANI for damage and consequential operating loss affecting installations involved in the manufacture of fuel, up to €650 million, with a deductible not exceeding €5 million in damages and 90 days in operating losses. In addition, EDF Inc. is a member of NEIL (Nuclear Electric Insurance Limited) – a nuclear mutual insurance company located in the United States, so as to cover the activities of CENG (Constellation Energy Nuclear Group) in the United States.

Pandemic

In France and in 2020, employee health and provident insurance policies do not exclude the consequences of the pandemic; moreover, only operating losses resulting from a damage claim may be insured for certain Group companies. As a result, the Group has not been confronted with the issues related to possible pandemic-related exclusions in property and casualty insurance policies.

Premiums

The total amount of Group insurance premiums for all types of cover was €240 million in 2020.

2.1.3 Focus on the 3rd line of control: the Group's audit unit

The Group's audit unit is composed of all of the audit resources of the Group exercising an internal audit activity. Pursuant to a decision of the Chairman and CEO this function is supervised by the Group Audit Director. It includes the Internal Audit Department ("IAD" reporting to the General Secretary) and audit teams specific to each of the main French and foreign subsidiaries. The relationship between the IAD and Enedis audit teams, as well as their respective prerogatives were set to ensure compliance with the principle of management independence. The IAD carries out functional supervision of the business line (co-appointment and peer assessment of Audit Directors of the subsidiaries by the IAD – excluding Enedis –, exchanging best practices, training, sharing tools and methods, etc.). At the end of 2020, the Group audit unit consisted of 70 FTE [1].

(1) Full-Time Equivalent.

Operating standards for EDF and controlled subsidiaries

The IAD applies the international standards defined by the Institute of Internal Auditors and monitors their compliance.

The missions, powers and responsibilities of the auditors as well as the rights and duties of the audited parties are defined in a charter that was issued in July 2019. It sets out the fundamental principles governing audits, the procedures for drawing up the programme, the types of assurance assignments entrusted to it, and the duties of the audited parties and auditors. It includes a code of ethics applicable to the entire sector. This code is intended to promote a culture of ethics and serves to reiterate that the auditor must comply with and apply certain basic principles relevant to the profession and the conducting of internal audits.

The Internal Audit Department has direct access to the Chairman and Chief Executive Officer; it reports on assignments to the Audit Committee, which gives an opinion on the risk-based internal audit universe, reviews the performance of audits and verifies the adequacy of the workload and resources dedicated to internal audits.

Auditors are trained in the same methodology, in line with international standards and are evaluated at the end of each mission.

The IAD's processes for all activities (from the definition of the audit programme to the monitoring of action plans) are outlined and steered.

The audit unit regularly submits voluntarily to evaluation by IFACI [(1)]. The last evaluation of 2018 stated, as previously, that the audit practices were compliant with the international standards of the profession.

Functioning procedures

The Group's audit unit conducts audits of the entities and controlled subsidiaries, Business Units, projects and cross-functional functions. These audits include a review of the robustness of internal control and are carried out every three to five years depending on their level of significance. The IAD conducts corporate cross-functional audits, whereas the Audit Departments of the subsidiaries only conduct audits within their scope. The IAD is the only entity competent to carry out audits of BUs/projects involving a corporate level risk.

The audit program is drawn up on the basis of the Group's priority risk universe; all Group BUs, projects and processes must be audited on a regular basis.

All audits give rise to recommendations which, once validated by the audited parties and their management, become the subject of action plans drafted by the aforementioned management and audited parties. These action plans are sent for opinion to the IAD, which subsequently monitors them, starting no later than six months after the audit report is circulated.

A half-yearly summary report recaps the main findings of the corporate audit and the follow-up of action plans. The half-yearly report also presents the results of the audit programme, the satisfaction of the audited parties, the activity of the sector as well as an assessment of skills and the budget. Furthermore, it identifies any recurring or generic problems observed in several audits and which merit special attention. Finally, it provides an audit-based view of the Group's level of risk control. This report is presented to the Chairman and Chief Executive Officer, the Executive Committee, and then to the Audit Committee and the Board of Directors.

2.1.4 External controls

Like all listed companies, the EDF group is subject to review by the AMF. As a company majority owned by the French State, EDF is also subject to control by the Cour des Comptes (French Court of Auditors), State Controllers, the Inspectorate of Finance, Economic Affairs Committees or *ad hoc* Committees of inquiry of the French National Assembly and Senate.

According to law, the Statutory Auditors certify the annual financial statements (parent company and consolidated financial statements) and perform a limited review of the Group's half-yearly condensed consolidated financial statements. Their report includes the verifications on the information on corporate governance required by the Articles L. 225-237-3 *et seq.* of the French Commercial Code.

In the light of its activity, EDF is also subject to control, in France, by the Energy Regulation Commission (CRE) and the French Nuclear Safety Authority (ASN).

2.2 Risks to which the Group is exposed

The Group operates in a fast-changing environment that entails numerous risks of various kinds: they may be strategic or operational; some are exogenous, others are endogenous and inherent to the Group's business lines. Their consequences may be manifold and may affect the Group's operating results, the Group's financial position and its ability to finance its strategy or development, affect its internal or external stakeholders or environment, or impact its reputation.

The Group describes hereinafter the specific risks to which it considers itself exposed. The principle of specificity leads us to describe in this section only those risks for which the specificity of the EDF group is a key factor. For risks that are not specific to the Group, the absence of a risk description in this section does not exclude the Group from taking the risk into account.

Risks are divided into five categories, described in sections 2.2.1 to 2.2.5 respectively.

Section 2.2.1 "Market regulation, political and legal risks" describes the risks related to changes in public policy and regulation in the countries and territories where the Group operates, as well as the legal risks to which the Group is exposed.

Section 2.2.2 "Financial and market risks" describes the risks arising from exposure to the energy markets in which the Group operates, as well as risks related to changes in the financial markets and the reliability of related information.

Section 2.2.3 "Group transformation and strategic risks" describes the risks related to the Group's ability to adapt, particularly in terms of strategy and skills, in response to the needs for transformation brought about by climate change, new competition, and technological and societal changes.

Section 2.2.4 "Operational performance" describes the risks related to the control of the Group's operating activities across its various industrial activities and projects, including EPR, services and sales. In particular, this section describes the risk to the Group relating to current and/or future EPR projects, which is a major risk.

Section 2.2.5 "Specific risks related to nuclear activities" supplements section 2.2.4 for the Group's nuclear-related activities, which entails additional risk factors and special provisions, particularly in view of the primary requirements of nuclear safety and the very long-term capital-intensive nature of nuclear activity.

The risks are outlined in detail in each of the relevant sections for their respective category. They are numbered to make it easier to connect the table with the graph and the detailed descriptions that follow.

The economic disruptions caused by the Covid health crisis led to a drop in demand for electricity in 2020 and had a significant impact on many of the Group's activities, most notably nuclear production, construction sites (construction of major projects and maintenance of nuclear power plants) and service activities. This health crisis will continue to affect the Group's performance in 2021 and beyond. Its impact on the Group's risks is specified in the presentation of each of the risks concerned. The main impacts are as follows:

- disruption of industrial supply chains for products or equipment from countries affected by the epidemic (risk 4E);
- health impacts on the activity of the Group's employees and service providers (risk 4C);

(1) Institut français de l'audit et du contrôle interne (French Institute of Audit and Internal Control).

- disruption of the running of the Group's operations, construction sites and major projects in the event of restrictions likely to affect business continuity (risk 4A) and possibly the level of production, particularly in the event of an impact on nuclear unit shutdowns (risk 5A);
- Covid impact effects on demand and the weakening of the economy (unpaid and uncollectable amounts) (3A);
- impact of a possible slowdown in economic activity with regard to the price of raw materials and electricity on the wholesale markets, as well as on the level of demand for electricity or counterparty risks (risks 2C and 2E);
- impact of a disruption in the financial markets through a decrease in the valuation of the portfolio of dedicated assets or pension assets affecting the Group's financial results and the coverage rate of nuclear provisions, and impact of a decrease in interest rates on the calculation of the amount of nuclear provisions and provisions for employee benefits (risks mentioned in chapter 2.2.2).

These impacts could be accentuated if the crisis were to continue.

All the risks identified in this document have been selected because they are significant in terms of the materiality of their estimated impact on the Group. In addition, they are prioritised based on a qualitative assessment of their criticality, taking into account simultaneously the significance of the potential impact for the Group, the probability of their occurrence and the level of control, in light of the actions undertaken. This prioritisation produces a three-level scale for all risks: the criticality can be considered strong, intermediate or moderate. The categories are not hierarchically arranged, but the risks are compared with each other, which is reflected in their level of criticality.

As a general rule, the scope of exposure is France, Belgium, Italy, the United Kingdom and all countries in which the Group is present. Where the scope of exposure is more restrictive, it is specified in the table and in the risk description.

Exposure to risk may vary according to duration. The potential impact of these risks may produce effects at very different time horizons, ranging from very short term (less than a year), to medium term (up to a few years) to very long term (up to several decades or more, given the nature of the relevant industrial activities which may span centuries).

In order to control risks, measures have been put in place. Some measures apply to all risks: internal control, commitment approval process (see section 2.1); others are specific to each risk.

Additional provisions for taking into account certain risks related to Corporate Social Responsibility are set out in Chapter 3. Cross-references shall, where appropriate, be specified in the risk description.

EDF group's specific risks

1. Market regulation, political and legal risks

- **1A** – Public policy developments in France and Europe
- **1B** – Changes in the regulatory environment (ARENH, regulated sales tariffs, environmental legislation, and SNBC national low carbon strategy)
- **1C** – Evolution of the regulatory framework for hydraulic concessions***
- **1D** – Evolution of the regulatory framework for electricity distribution concessions ***
- **1E** – Ethics or Compliance violations
- **1F** – Legal litigation risk
- **1G** – Insufficient compensation for missions of general interest*

2. Financial and market risks

- **2A** – Interest rate risk
- **2B** – Financial markets risk
- **2C** – Energy market risk
- **2D** – Exchange rate risk
- **2E** – Counterparty risk
- **2F** – Access to liquidity risk

3. Group transformation and strategic risks

- **3A** – Transformation capacity in the face of disruptions
- **3B** – Adaptation to climate change: physical and transition risks
- **3C** – Adaptation of employees'' skills
- **3D** – Ability to ensure long-term social commitments

4. Operational performance

- **4A** – Management of large and complex industrial projects (including EPR projects)
- **4B** – Hydraulic safety violations
- **4C** – Occupational health or safety violations (employees and service providers)
- **4D** – Attacks against assets, including cyberattacks
- **4E** – Operational continuity of supply chains and contractual relationships
- **4F** – Risk of a blackout or supply/demand imbalance
- **4G** – Industrial safety and impact on environmental assets, including biodiversity

5. Specific risks related to nuclear activities

- **5A** – Failure to comply with the objectives (i) in terms of operation and/or (ii) in terms of extending the operating life of nuclear power plants (France and United Kingdom) **
- **5B** – Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments ***
- **5C** – Nuclear safety risks during operation resulting from nuclear civil liability **
- **5D** – Control of the fuel cycle **

Caption

- **Strong criticality**
- **Intermediate criticality**
- **Moderate criticality**

Main scope of exposure, France, Europe and International, except for specific notes
** France*
*** France and United Kingdom*
**** France and Italy*

2.2.1 Market regulation, political and legal risks

1A: Public policy developments in France and Europe.

Changes in public energy policies and the political framework of market regulation in the countries where the Group operates, such as the energy-climate act or the Multi-year Energy Programme (PPE) in France, or the "Green deal" in Europe, are likely to lead to profound changes in the Group' governance or business portfolio. These could hinder the Group's development in relation to its competitors or undermine its ability to meet its commitment to climate protection.

Criticality in view of the control actions undertaken: Strong.

By decree of 21 April 2020, the French government adopted the Multiannual Energy Programming (PPE) which sets out the government's priorities for action in the field of energy for the continental metropolis for the period 2019-2028.

In particular, in this context:

- the French Government has confirmed the objective of diversifying the electricity mix and reducing nuclear power to 50% of electricity production in France by 2035: to reduce nuclear power to 50% of the energy mix, 14 reactors should be shut down by 2035 (including the two at Fessenheim). This would represent a quarter of the reactors currently operating in France. At the request of the French government, EDF offered to study the shutdown of reactor pairs at the Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin sites. It will ultimately be up to the government to identify which sites have priority. It could therefore be decided to shut down one or more reactors in the EDF fleet prematurely, not as a result of an industrial choice but as a result of the application of the Multi-year Energy Programme (PPE). Such decisions should lead to EDF being compensated for the harm suffered, as reiterated by the French Constitutional Council in a decision of 13 August 2015;
- in this respect, with regard to the Fessenheim nuclear power plant, on 27 September 2019, EDF sent the Minister responsible for ecological and solidarity transition and the Nuclear Safety Authority the declaration of permanent shutdown of the two reactors of the Fessenheim nuclear power plant, and, on 30 September 2019 a request to terminate the authorisation to operate such plant. The submission of this request and declaration follows the signing, on 27 September 2019, by the French State and EDF, of the protocol governing the State's indemnification of EDF for the early closure of the Fessenheim power plant. In accordance with the Decree of 18 February 2020 repealing this authorisation, reactors no. 1 and no. 2 were definitively shut down on 22 February 2020 and 30 June of the same year, respectively. Decommissioning operations will only begin once the decree stipulating decommissioning operations has been issued by the French Minister in charge of nuclear safety.

The Energy-Climate Act was enacted on 8 November 2019. It specifies the key points of the energy and ecological transition policy in France and updates the objectives set by the energy transition act for green growth.

In particular:

- in terms of energy mix, the Act ratifies the postponement to 2035 of the deadline for reducing the share of nuclear power in electricity production to 50%. The Act also raises the fossil fuel consumption reduction target from 30 to 40% by 2030 (compared to 2012), and plans to achieve carbon neutrality by 2050 by dividing greenhouse gas emissions by a factor of more than six;
- it sets up a scheme to limit from 1 January 2022 the level of CO_2 emissions from installations generating electricity from fossil fuels, with the aim of closing down coal-fired power stations by 2022;
- in addition, the Act changes the ARENH system in two ways: it raises the "ARENH ceiling" from 100 to 150TWh as of 1 January 2020 to allow the French government to increase the maximum overall volume of electricity that EDF transfers to alternative suppliers by decree to 150TWh. The Act also authorises the French government to revise the price of ARENH. In its decision of 7 November 2019, the French Conseil constitutionnel (Constitutional Council) made the legality of such a decree conditional on sufficient consideration of "the economic conditions governing the generation of electricity by nuclear power plants". However, the French government had not implemented these possibilities by the end of 2020.

The Act also specifies the procedure concerning the Strategic Business Plan (PSE), which will have to cover both periods of the Multi-year Energy Programme (PPE), be made public (with the exception of information relating to business secrecy), and present the accompanying measures put in place for employees as a result of the closure of nuclear or thermal power stations. In the event that the PSE is incompatible with the PPE, the act provides for a formal notice followed, if necessary, by sanctions.

The European legal framework, which notably organises the liberalisation of the energy sector and climate and energy policies, underwent significant changes in 2019 with the finalisation of the Clean Energy Package and is likely to evolve in the future, in particular through the "Green deal".

The "Green deal", a flagship mechanism of the new European Commission, is likely to include key provisions for the energy sector in general and the EDF group in particular. In this context, the foundations for important changes in the European legal framework applicable to the energy sector and affecting climate and energy policies were laid in 2020 with the publication by the European Commission of several strategies and a limited number of concrete legislative proposals on infrastructure and sustainable finance. The potential consequences could be as follows:

- the revision of the EU Emissions Trading Scheme (EU-ETS) within the EU, including its extension to other sectors, could introduce many uncertainties and risks regarding the level and predictability of prices. Furthermore, the relationship between the various measures and objectives currently under review (renewables, energy efficiency) must also be clarified;
- the various legislative proposals aimed at regulating the development of hydrogen could limit support policies to renewable hydrogen only, thus limiting funding for electrolytic hydrogen produced from the French low-carbon electricity mix;
- the revision of the Guidelines for State Aid for Energy and the Environment (LDAEE) poses a pivotal challenge for the EDF group's future investments. The main risks are the alignment of the LDAEE with the taxonomy (in particular the possible exclusion of nuclear and certain hydraulic activities), the creation of brakes on long-term investments and possible restrictions on capacity mechanisms.

In 2020, the legal framework for the European Taxonomy for Sustainable Finance was set out in more detail. At the end of 2020, the taxonomy delegated act proposed by the Commission did not include nuclear power, which was dealt with in a specific process; referred to restrictions on hydraulic works that go beyond the applicable European legal framework; and proposed an emission threshold for low-carbon hydrogen that would not allow the hydrogen produced from the French electricity mix to be classified as sustainable. EDF continues to be strongly active on this subject, even though the Council and the European Parliament have the right to veto the text in its entirety. This poses a major risk for the Group, as the exclusion of nuclear power could seriously hamper the Group's ability to finance itself.

In addition, the negotiations that the French State began in 2020 with the European Commission on the new regulation of existing nuclear power will continue in 2021.

These developments could be unfavourable to the Group and could adversely affect its ability to meet its commitment to climate protection. In particular, they could result in insufficient asset compensation, not be in line with the Group's development objectives, change the competitive environment in which the Group operates, change the level of regulated tariffs or affect the profitability of current or future production units or any of the Group's other activities. In general, the legislative and regulatory framework put in place in France, in Europe or in the countries where the EDF group is present is likely to have a significant impact on the Group's results or its business model.

Moreover, in terms of the governance or delimitation of its scope of activity that may be enforced, EDF group could be affected by a limitation or loss of control of certain strategic and operational decisions that could have a negative impact on the outlook and profitability of its various activities. At the same time, EDF, as a shareholder, may continue to bear certain risks, calling into question its potential liability with regard to third parties or affecting the profitability of its assets. Finally, the competent authorities or certain States could, in order to preserve or promote competition on certain energy markets, take decisions that are contrary to the Group's economic or financial interests or that impact its integrated operator model.

Finally, in the renewable energies field, EDF relies primarily on its EDF Renewables subsidiary (see section 1.4.1.3.3 "EDF Renewables activites"), which does business in numerous countries. The profitability of these developments often depends on the support and tendering policies implemented in the different countries. The Group cannot guarantee that these policies will not change in some of these countries in ways that will be detrimental to the profitability of investments.

1B: Changes in the regulatory environment (ARENH, regulated sales tariffs, environmental legislation, ESC and SNBC national low carbon strategy).

A significant portion of the Group's revenues comes from regulated activities. Thus, any change in regulated sales tariffs, the ARENH or the Tariffs for Using the Public Transmission and Distribution Networks (TURPE), or any change in the regulation (energy savings certificates, environment regulation, CO2 regulation), would be likely to affect the Group's profitability and its ability to meet the challenges of energy transition by developing low-carbon energy solutions for the protection of the climate. Furthermore, given the impact of ARENH on EDF's financial situation, the failure of its reform represents a major risk for the Group

Criticality in view of the control actions undertaken: Strong.

ARENH reform - major risk if no reform is carried out

The law on the New Organisation of the Electricity Market (NOME law or *Nouvelle Organisation du Marché de l'Electricité*) has introduced the Regulated Access to Electricity from the Existing Nuclear Fleet (ARENH), for the benefit of EDF's competing electricity suppliers.

The Multi-Year Energy Programme (PPE) stipulates that "the government will propose the terms of a new regulation for existing nuclear power that will make it possible to guarantee consumer protection against market price increases beyond 2025 by giving them the competitive advantage linked to the investment made in the historic nuclear fleet, while giving EDF the financial capacity to ensure the economic sustainability of the generation facilities to meet the needs of the PPE in low price scenarios.".

With this in mind, in January 2020, the government launched a call for contributions from market players and stakeholders on the fundamental findings that lead to the need for a new economic regulation, as well as on its proposed construction and operating principles.

Any modification of the ARENH system (volume ceiling, prices) or its replacement by a new system is the responsibility of the French government or the legislator and requires prior in-depth discussions with the European Commission, which means that there is a great deal of uncertainty about what changes will ultimately be implemented and the associated deadlines.

In this context, the major risks for the Group are as follows:

- with regard to the existing ARENH system, under the current conditions of the scheme:
  - the optional nature of the mechanism gives suppliers opportunities for arbitrage between the ARENH mechanism and the markets to the detriment of EDF, and exposes EDF to major uncertainties that have a negative impact on the effectiveness of its energy market risk management with no corresponding consideration since the option is free of charge. As a result, EDF is highly exposed to falls in wholesale electricity market prices when their total level (energy + capacity) is below the ARENH price (currently €42/MWh) for the year of delivery in question. Conversely, the positive impact of wholesale electricity market price increases is limited when their total level (energy + capacity) is above the ARENH price,
  - risk of an increase in the volume of ARENH without sufficient change in price (see "risk 1A Changes in public policies in France and Europe"). If this development were implemented, it would further reduce EDF's ability to benefit from wholesale market prices for electricity when their total level (energy + capacity) is above the ARENH price. The French government has announced, however, that it will not increase the ceiling of the HRDA for 2021,
  - furthermore, the implementation of the mechanism was the subject of disputes in 2020, described in note 1.4.1 to the consolidated financial statements. These disputes relating to the application of *force majeure* in the context of the Covid-19 health crisis exemplify the arbitrage carried out by certain alternative suppliers when market prices become lower than the ARENH price, by suspending the performance of the ARENH contract between them and EDF in order to benefit from cheaper supplies on the markets;
- with regard to future regulations: a comprehensive negotiation on the framework of the future regulation of existing nuclear power is currently underway between the French State and the European Commission. The main risks relate to the level of prices, the French State's ability to negotiate with the European Commission sufficient terms of compensation and proportionate consideration. The risk that these negotiations might fail is a major risk for the Group, particularly in its ability to finance the development of its strategy.

Tariff regulation

In France, a significant portion of the EDF group's revenues is based on regulated tariffs set by public authorities or regulatory authorities (Electricity Regulated Sales Tariffs – TRVE, Tariffs for Using the Public Transmission and Distribution Networks – TURPE).

Within the framework of the Energy and Climate Act, several provisions have been taken concerning regulated sales tariffs or the ARENH:

- the provisions concerning the ARENH: they are described in §1A above (Developments in public policies in France and Europe);
- the reduced scope of sites eligible for the Regulated Sales Tariffs (TRVE): as of 1 January 2021, only domestic end consumers, including sole proprietors and co-owners' associations of a single residential building;
  - domestic end consumers, including sole proprietors and co-owners' associations of a single residential building,
  - and non-domestic end consumers employing fewer than ten people and having annual sales, revenue or balance sheet total not exceeding €2 million may benefit from the TRVE for their sites with a subscribed power less than or equal to 36kVA.

In this context, the major risks for the Group are as follows:

- with regard to the regulated sales tariffs: risk of disputes by stakeholders;
- with regard to TURPE 6: the Energy Regulatory Commission has been organising the consultation process since 2019 for the future TURPE 6. This process gave rise to a deliberation by the Energy Regulatory Commission on 21 January 2021 and should culminate in a publication in the French Official Gazette at the end of March 2021, due to come into force on 1 August 2021. The risk involves whether the level of compensation of network operators is sufficient to enable them to carry out the tasks entrusted to them.

More generally, in France as in other countries, the Group cannot guarantee that the ARENH, regulated sales tariffs, TURPE or local tariff regulations will be set at levels that enable it to preserve its short-, medium- and long-term investment capacity and its proprietary interest, by ensuring a fair return on the capital invested by the Group in its generation, service, transmission and distribution assets.

Other regulatory issues

- **Environmental regulation** (ER): in order to meet the National Low Carbon Strategy (SNBC) target of zero CO_2 emissions from residential and tertiary buildings by 2050, the 2020 ER, which is due to come into force at the beginning of 2022 for single-family homes, multi-family dwellings, office and educational buildings and will be applied one year later for the other tertiary sectors, gives priority to reducing the carbon footprint of buildings. Correcting the pitfalls of the 2012 thermal regulation which led to the generalisation of

gas heating in collective housing, the 2020 ER aims to promote the use of low carbon energy in low-energy buildings by concentrating on three priority areas:

- continuing to improve energy performance and reduce consumption in new buildings, with even more efficient insulation, with the same minimum level of insulation for all;
- reducing the carbon impact of new buildings on the "operation" and "construction" sides;
- ensuring better adaptation to future climatic conditions, including "summer comfort" to "withstand the heat waves that will become more frequent and intense as a result of climate change".

In particular, it is expected that a greenhouse gas (GHG) emission cap on operations will be set at 4kg CO_2 eq/m^2.yr in single-family homes and 14kg CO_2 eq/m^2.yr in collective housing, initially before being reduced to 6kg CO_2 eq/m^2.yr thereafter. These values would facilitate the deployment of efficient, low-carbon solutions such as heat pumps (PAC), virtuous heating networks (rate of renewable and recoverable ENR&R energy >60%) and biomass.

The texts – decree and order – enabling the implementation of this system are expected to be published in the first half of 2021.

- **Energy Savings Certificates**: In France, the energy savings certificates (ESC) measure, which is set out in Articles L. 221-1 *et seq*. of the French Energy Code, imposes energy savings obligations on energy sellers. It sets a multi-year savings target and financial penalties for non-compliance. This measure was revised as of the third period (2015-2017) by adding an additional measure relating to energy savings for the benefit of households facing energy poverty, thereby reinforcing the Group's actions relating to the CSR issue of "Energy poverty and social innovation". The overall level of bonds was doubled in the fourth period (2018-20, extended to 2021). The Act of 8 November 2019 also includes a chapter on the fight against ESC fraud and aims to greatly increase the number and effectiveness of controls and sanctions.

  The doubling of the bond, in a market where the activation of new energy-saving deposits generating Energy Saving Certificates takes time and is subject to increased competition between obligors, has led to considerable pressure, resulting in particular in a significant increase in the price paid for trading Energy Saving Certificates over-the-counter. The latter has levelled off relatively well since the beginning of 2019 under the combined effect of the Government's "stimulus package" and the one-year extension of the fourth period. However, there is still a risk that the objective will not be achieved by the end of the period, which may therefore lead to deterioration in the Group's financial position. In addition, the fifth period, which is to begin in 2022, could result in increased bond volumes and constraints, which would pose new risks to achieving the objective. Finally, there is a risk of non-compliance regarding the ESCs (produced or acquired by EDF), for which the Group has set up appropriate governance and mechanisms.
- **Price of CO_2**: There is also a risk, which could be brought about by inadequate regulation, that CO_2 prices may be too low or highly volatile and not allow sufficient development of low-carbon energy solutions, at the expense of an effective transition in favour of the fight against climate change. This may represent a loss of opportunity to promote the Group's low-carbon energy solutions and call into question the Group's ability to achieve its decarbonisation objectives.

1C: Evolution of the legal and regulatory framework for hydraulic concessions.

The Group carries out its hydropower generation activities under concessions, licence or delegation agreements. Therefore, the Group does not always own the assets it operates. In France, changes in the legislative and regulatory framework, particularly for the renewal of concessions (provisions for the most powerful installations), changes in the economic conditions of concession specifications and the conditions for implementing advertising and competitive bidding procedures could have an impact on the Group's results.

Criticality in view of the control actions undertaken: Intermediate.

In France, hydropower generation facilities are operated under concessions awarded by the French State for structures of 4.5MW or more and within the framework of prefectoral authorisations for structures of less than 4.5MW. The challenges associated with the renewal of hydraulic concessions in France are specified in section 1.4.1.3.1.4 "Hydropower generation issues". To date, the French State has still not renewed 20 concession titles that expired on 31 December 2020, corresponding to an installed capacity of 2,508MW.

The EDF group cannot guarantee that each of the concessions that it currently operates will be renewed, or that any concession will be renewed under the same financial terms and conditions as the initial concession. Furthermore, the Group cannot guarantee that the compensation paid by the government in the event of early termination of a concession's operation will fully compensate the Group's consequent loss of revenue, or that future regulations will not change in a way that could negatively affect the Group. These factors could have an adverse impact on its activities and financial position.

The Group also operates under hydroelectric power generation concessions in other countries where it operates, notably in Italy. Depending on the conditions in each country, these concessions may not be continued or may not be renewed in its favour with changes to the financial terms and conditions of the concession specifications, which would have an adverse impact on the Group's activities and financial position.

1D: Evolution of the regulatory framework for electricity distribution concessions.

Enedis conducts its distribution activities under public service concessions and does not own most of the assets it operates. Changes in the regulatory framework, and in concession specifications could have an impact on the Group's results.

Criticality in view of the control actions undertaken: Intermediate.

In France, the law stipulates that Enedis and the Local Distribution Companies (LDC) have, in their respective service areas (as well as EDF for areas not interconnected to the continental metropolitan network), exclusive rights to ensure the public service of public electricity distribution. In the same way, EDF and the LDCs carry out a supply mission in their service areas at regulated tariffs, similarly under the exclusive rights granted to them under law.

Insofar as all the assets constituting the public electricity distribution network, with the exception of the source substations, are owned by the authorities organising the public distribution of electricity (AODE), the law provides that Enedis enters into concession agreements with the latter, generally for a term of 25 to 30 years. In this way, Enedis carries out its public service missions (network maintenance, renewal and development, metering, connections, etc.) both under the law (the French Energy Code specifies the missions of distribution network operators) and under these contracts. Moreover, the purpose of such contracts is, yet again in application of the law, to provide access to the regulated sales tariffs; they are therefore trilateral (they bind the authorities organising the public distribution of electricity (AODE), the distribution system operator and the supplier to the regulated tariffs).

Due to the exclusive rights granted to them, Enedis and EDF, when renewing a concession contract, cannot be pitted against other players. This is the legal basis for the current process of renewing concession contracts with all of the authorities in charge of organising electricity distribution, based on a new contract template drawn up in December 2017 by the FNCCR (Fédération nationale des collectivités concédantes et régies (National Federation of Licensing Authorities)), France Urbaine, EDF and Enedis. Although two recent decisions by the French Council of State (Conseil d'État) have confirmed the compatibility of the exclusive rights granted to EDF and Enedis with, on the one hand, European Union law and, on the other hand, the constitutional principle of the free administration of local authorities, the Group cannot guarantee that such provisions will not be modified in the future through legislation. Furthermore, the Group may not obtain the renewal of these contracts under the same financial terms and conditions.

1E: Ethics or Compliance Violations.

Risks of prohibited and unethical practices in the conduct of business by employees or third parties could put the EDF group at risk of non-compliance with regulations, or even violations of human rights or fundamental freedoms.

Criticality in view of the control actions undertaken: Moderate.

The international nature of the Group's activities and the strengthening of regulatory frameworks that punish unethical business practices, in particular, are likely to expose the Group, its employees or third parties acting on behalf of the Group to breaches of its ethical commitments or non-compliance that could damage its reputation or lead to civil or criminal sanctions.

The Group has implemented all the necessary measures to ensure that its practices comply with the regulations in force. Reporting to the General Secretariat, the Group Ethics and Compliance Department (DECG) is responsible for disseminating knowledge of, and compliance with, the Group's ethical values, as well as the main regulations to which the Group is subject by virtue of its activity and geographical locations. In particular, thirteen programmes have been set up to prevent risks relating to ethical breaches or non-compliance. These programmes cover the following topics:

- preventing the risk of corruption and influence peddling;
- preventing conflicts of interest;
- fight against fraud;
- compliance with international sanctions programmes;
- prevention of harassment and discrimination;
- prevention of market abuse;
- prevention of the risk of money laundering and financing of terrorism;
- compliance with the EMIR European regulation (European Market Infrastructure Regulation to regulate financial markets);
- compliance with the REMIT (Regulation on Wholesale Energy Market Integrity and Transparency) regulation;
- preventing breaches of competition law;
- personal data protection;
- export control (dual-use goods);
- a duty of care (which covers the environment, human rights and health and safety).

These programmes are set out in section 3.3.2 "Ethics, compliance and human rights". Failure to comply in any way with the regulations associated with these various topics could cause legal action to be taken against EDF, which could adversely affect the Group's results and reputation.

1F: Legal litigation risk.

Proceedings or litigation could have a significant financial or reputational impact on the Group.

Criticality in view of the control actions undertaken: Moderate.

In the ordinary course of its business, the EDF group is involved in litigation, the development of outcome of which could have a material adverse effect on its results or financial position.

In particular, the EDF group is subject in France to proceedings initiated by its competitors or by administrative authorities owing to its position in certain markets. Claims made against EDF could be considerable and could lead to the payment of compensation or a fine, or even lead to orders being issued that could have an impact on some of EDF's activities. For example, in proceedings before the competition authorities in France or by the European Commission, the amount of fines may be as high as 10% of the consolidated revenues of the company concerned (or of the group to which it belongs, as the case may be). The EDF group may also be involved in litigation relating to commercial or fiscal disputes with significant stakes, the outcome of which is inherently unpredictable.

The EDF group considers that overall, in all the countries in which it operates it complies with all the specific regulations in force, and mainly those relating to the conditions under which it carries out its nuclear activities, but it cannot anticipate in this respect what the supervisory and administrative or judicial authorities, which are consulted, may decide. These risks are monitored with particular vigilance and give rise to implementation of prevention policies (contractual policies, compliance policies, etc.). A procedure is in place to provide information to the Group's Legal Department on actual or potential material litigation or other disputes and investigations.

The main proceedings in which the EDF group is involved are described in notes 17.3, 5 and 1.4.1 of the appendix to the consolidated financial statements and in section 7.1.5 "Disputes".

1G: Insufficient compensation for missions of general interest.

EDF is responsible for certain general interest missions, in particular public service missions, the costs of which are covered by mechanisms that might not fully compensate for the additional costs incurred in connection with these obligations, or which might be called into question.

Criticality in view of the control actions undertaken: Moderate.

In France, public service missions are assigned to EDF under French law (in particular Articles L. 121-1 *et seq*. of the French Energy Code), which also provides for compensation mechanisms in favour of EDF in respect of the discharge of such missions. The estimated amount of public service energy costs to be offset in France in 2021 for EDF amounts to €9,492.1 million (decision of the Energy Regulation Commission of 15 July 2020 on the assessment of public service energy costs for 2021) (it must be noted that the repayment schedule came to an end and that the historical CSPE receivable was thus entirely reimbursed). The amounts of public service charges are set out in the Finance Act n°2020-1721 of 29 December 2020 for 2021.

The development of renewable energies connected directly to the distribution network may, in certain regions, saturate the reception capacities of the source substations and networks. This situation may possibly generate local imbalances, or disputes if Enedis must disconnect certain producers or connect them with significant delays. New investments may be required in these regions, with the risk that the costs associated therewith may not be taken into account.

More broadly, the texts provide for EDF to be fully compensated for the public service charges it bears. However, even if this principle of full compensation of public service obligations is legislated, it cannot be completely ruled out that the terms of said compensation may be called into question and that said compensation may not include any new public service obligation allocated to EDF (for example, at the end of the negotiations on the new public service contract).

EDF maintains a close dialogue with the French State authorities on the issue of financing public energy service obligations in order to implement and secure the compensation mechanism (particularly with respect to working capital requirements), so as to secure payment by the French State at the end of the year and avoid year-on-year arbitrations by the French State.

The occurrence of any of these events may have an adverse impact on EDF's activities, results and financial position. Such situations could also call into question the Group's ability to meet its CSR goals, mainly those aiming at helping fragile populations (see section 3.3.4 "Energy poverty and social innovation").

2.2.2 Financial and market risks

The EDF group, through its varied activities, is exposed to numerous financial and market risks. This section describes these various risks by addressing interest rate risk, financial market risk, energy market risk, foreign exchange risk, counterparty risk and liquidity risk. All of these risks could affect the Group's ability to finance its investments. Financial and market risks are also discussed in the activity report (see section 5.1.6) and the appendices to the financial statements.

2A – Interest rate risk.

The Group is exposed to risks related to changes in interest rates in the various countries in which it operates. These rates depend partly on the decisions of the central banks.

Criticality in view of the control actions undertaken: Intermediate.

Risk of falling interest rates

Lower interest rate fluctuations could affect the Group's economic indebtedness, due to changes in the value of the Group's financial assets and liabilities, as well as its discounted liabilities. The discount rates for pension and other specific employee benefit commitments (see note 16 of the appendix to the consolidated financial statements for the year ended 31 December 2020) and the Group's long-term nuclear commitments (see note 15 of the appendix to the consolidated financial statements for the year ended 31 December 2020) are directly or indirectly linked to interest rates over different time horizons.

For the specific case of nuclear provisions in France, given the decline in rates over the past few years, the discount rate could be reduced over the next few years. The extent of this decrease, if any, will depend on the future evolution of rates, mainly 20-year sovereign rates.

The order of 1 July 2020 on securing the financing of nuclear expenses, which amends the initial order of 21 March 2007, outlines new provisions concerning the regulatory ceiling on the discount rate. This is now expressed as a real value corresponding to the unrounded representative value of the expected long-term actual interest rate used for the calculation published by the European Insurance and Occupational Pensions Authority (EIOPA) of the ultimate forward rate (UFR) applicable on the relevant date, increased by 150 basis points. This ceiling is applicable as from the year 2024. Until 2024, the ceiling is equal to the weighted average of 2.3% and this new ceiling. The weighting assigned to the 2.3% amount is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023.

Furthermore, an increase in nuclear provisions due to a decrease of the discount rate may require allocations to the dedicated assets and may result in an adverse effect on the Group's results, cash flow generation and net debt.

As the case may be, this increase in provisions, including those covered by dedicated assets, does not mean however a mechanical impact on the amount to be allocated to dedicated assets as of the considered dates, as the former depends on:

- the return on dedicated assets and the resulting hedge rate;
- the period within which the allocation is made, as applicable rules provide for the option to set a maximum time period to proceed with the allocation, subject to approval by the Supervisory Authority.

In this respect, the decree of 1 July 2020 relating to securing the financing of nuclear expenses has modified the regulatory framework of the allocation obligation:

- elimination of the obligation, which previously existed under certain conditions, to allocate funds to dedicated assets when the coverage rate is greater than 100%;
- raising the threshold to 120% (from 110% previously) above which it is possible to withdraw funds from dedicated assets;
- increasing to 5 years (instead of 3 years previously) the maximum period for allocating funds to dedicated assets in the event of undercoverage, following authorisation by the administrative authority.

These changes have no impact on the pre-existing 2020 allocation obligation in respect of the financial statements as at 31 December 2018 (€797 million) which was met in 2020.

Given the changes in the regulatory framework, no additional allocation is expected in respect of 2020, as the rate of coverage of nuclear provisions by dedicated assets is greater than 100%.

Overall, a 1% decrease in interest rates would have the following impacts:

(i) an impact on pre-tax income that could amount to approximately -€1,220 million for nuclear liabilities in France, as a result of the impact of this rate cut on the corresponding discount rate, all other things being equal;

(ii) an impact on pre-tax income of approximately -€200 million for provisions for employee benefits in France, as a result of the impact of this rate cut on the corresponding discount rate.

In total, the sensitivity of pre-tax income therefore amounts to approximately -€1,420 million for a 1% fall in interest rates.

Risk of higher interest rates

Upward variations in interest rates could affect the Group's ability to obtain financing on optimal terms, or even its ability to refinance itself if the markets were very strained in view of the risk related to changes in flows linked to variable-rate financial assets and liabilities. Financial securities and derivatives held by the Group, as well as debts issued, may pay or receive coupons directly indexed to variable interest rates.

Thus, a 1% increase in interest rates would have an effect on the pre-tax income of approximately -€200 million, due to the increase in coupons linked to the debt issued by the Group.

These unfavorable impacts related to a rise in interest rates are in principle more than offset by the favorable impacts related to a rise in interest rates in connection with long-term commitments (see previous point).

2B – Financial markets risk.

As a result of its activities, the EDF group is exposed to risks related to the financial markets, in particular equity risk.

Criticality in view of the control actions undertaken: Intermediate.

The Group is exposed to equity risk on securities held primarily as dedicated assets constituted to cover the cost of long-term commitments in relation with the nuclear business, in connection with outsourced pension funds and, to a lesser extent, in connection with its cash assets and investments held directly by the Group.

The market value of the listed equities in EDF's dedicated asset portfolio was €13,362 million at 31 December 2020. The volatility of the listed equities at the same date was 26.6% based on 52 weekly performances, compared to 9.2% at 31 December 2019. Applying this volatility to the value of listed equity assets at the same date, the Group estimates the annual volatility of the equities portion of dedicated assets at €3,554 million.

At 31 December 2020, the sensitivity of the listed bonds (€12,396 million) was 5.5, *i.e.* a uniform 100 base point rise in interest rates would result in a €678 million decline in market value. This sensitivity was 6.1 at 31 December 2019.

2C – Energy market risk.

In order to sell its output, the Group is exposed, directly or indirectly, to the prices of the European wholesale energy markets and capacity markets, the levels of which impact its financial position.

Criticality in view of the control actions undertaken: Intermediate.

In conducting its production and marketing activities, the Group does business in energy markets, primarily in Europe. As such, the Group is exposed to changes in wholesale market prices: electricity – energy prices and prices of capacity guarantees for the countries concerned -, gas, coal, petroleum products, CO_2 emission quotas (see section 5.1.2 "Economic environment" for information on recent changes in these prices). A connexion exists between these markets: a fall in the prices of gas, coal, oil products or CO_2 leads to a fall in electricity prices. In view of the dominant position of nuclear generation in the EDF fleet, which requires neither gas nor coal and does not emit CO_2, the fall in the price of these commodities has a very limited positive impact for the Group compared to the negative impact of the resulting drop in electricity prices.

Various factors, over which the Group has no control, influence these price levels: commodity prices on world markets, the balance between supply and demand, but also pricing and tax policies or subsidies allocated to certain means of production. As a result, these markets can experience significant and unpredictable price increases and decreases, as well as liquidity crises.

This exposure thus impacts the Group's revenue and all of its financial indicators. In particular, persistently low electricity prices may affect the profitability of the Group's generating units and, more broadly, the value of its assets, as well as the conditions for their maintenance, their life expectancy and any renewal projects.

In France, the degree of exposure to market prices for electricity depends on the level of sales under the ARENH system currently applicable until the end of 2025, which in turn depends on the level of market prices and potential regulatory changes. The risks related to possible changes in the ARENH system are described in Risk 1B "Changes in the regulatory framework".

The Group manages its exposure to energy markets through a specific energy market risk policy, which is essentially aimed at gradually reducing uncertainties regarding the level of its financial results in the coming years (see section 5.1.6.2 "Management and control of energy market risks" for more detailed information on the associated principles and organisations). This policy serves to mitigate the impact of price changes but cannot be used to negate them: the Group remains subject to the structural trends of upward or downward movements in these markets (see Note 18.6 "Market and counterparty risk management" of the appendix to the consolidated financial statements for the year ended 31 December 2020).

In addition, a Group REMIT Directive defines the expectations for ensuring that Group entities comply with the European regulation n° 1227/2011 on the transparency and integrity of wholesale energy markets (see section 3.3.2.2.4 "Compliance with the REMIT regulation"). However, there is a risk that it may not be possible to ensure compliance with this regulation.

2D – Exchange rate risk.

Due to the diversity of its activities and their geographical distribution, the Group is exposed to the risks of fluctuations in foreign exchange rates, which may impact currency translation adjustments, balance sheet items and the Group's financial expenses, equity and financial position.

Criticality in view of the control actions undertaken: Moderate.

Due to the diversification of its activities and geographical locations, the Group is exposed to the risk of exchange rate fluctuations, which may have an impact on the translation differences affecting balance sheet items, Group financial expenses, equity, net income and project internal rate of return (IRR).

As the Group is involved in long-term contracts, an unfavourable currency fluctuation could have consequences on project profitability. In the absence of hedging, currency fluctuations between the euro and the currencies of the various international markets in which the Group operates can therefore significantly affect the Group's results and make it difficult to compare performance levels from year to year. If the euro appreciates (or depreciates) against another currency, the euro value of the assets, liabilities, income and expenses initially recognised in that other currency will decline (or increase). Moreover, insofar as the Group is likely to incur expenses in a currency other than that in which the corresponding sales are made, fluctuations in exchange rates could result in an increase in expenses, expressed as a percentage of turnover, which could affect the Group's profitability and income.

To limit exposure to foreign exchange risk, the Group has introduced the following management principles:

- local currency financing: to the extent possible given the local financial markets' capacities, each entity finances its activities in its own functional currency. When financing is contracted in other currencies, derivatives may be used to limit foreign exchange risk;
- matching of assets and liabilities: the net assets of subsidiaries located outside the Euro zone expose the Group to a foreign exchange risk. The foreign exchange risk in the consolidated balance sheet is managed by market hedging involving use of financial derivatives. Hedging of net assets in foreign currencies complies with risk/return targets, and the hedging ratio varies depending on the currency, ranging from 46% to 67% for the principal exposures. If no hedging instruments are available, or if hedging costs are prohibitive, the foreign exchange positions remain open and the risk on such positions is monitored by sensitivity calculations;
- hedging of operating cash flows in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are in the relevant local currencies, with the exception of flows related to fuel purchases which are primarily in US dollars, and certain flows related to purchases of equipment, which concern lower amounts. Under the principles laid down in the Strategic financial management framework, EDF and the main subsidiaries concerned by foreign exchange risk (EDF Energy, EDF Trading, Edison, EDF Renewables) are required to hedge firm or highly probable commitments related to these future operating cash flows.

2E – Counterparty risk.

Like all economic operators, the Group is exposed to possible default by certain counterparties (partners, subcontractors, service providers, suppliers or customers).

Criticality in view of the control actions undertaken: Moderate.

A default by these counterparties may impact the Group financially (loss of receivables, additional costs, in particular if EDF is required to find satisfactory alternatives or take over the relevant activities or pay contractual penalties).

The Covid crisis may lead to a risk of some of the Group's counterparties defaulting. The Group remains vigilant, particularly with regard to industrial counterparties that could be weakened by this downturn in the economic situation. To date, there has not been any discernible material impact on the Group's commercial counterparties.

The risk may be hedged by the use of margin calls.

Furthermore, the Group has a counterparty risk management policy which applies to EDF and all operationally controlled subsidiaries. This policy sets out the governance associated with monitoring for this type of risk, and organisation of the counterparty risk management and monitoring. The policy also involves quaterly consolidation of the Group's exposures. The CRFI (Financial Risks Control) Department closely monitors Group counterparties (daily review of alerts, special cautionary measures for certain counterparties).

At 30 September 2020, 92% of the Group's exposure concerns investment grade counterparties, mainly as a result of the predominance of exposures generated by the cash and asset management activity, as most short-term investments concern low-risk assets.

2F – Access to liquidity risk.

The Group must at all times have sufficient financial resources to finance its day-to-day business activities, the investments necessary for its expansion and the appropriations to the dedicated portfolio of assets covering long-term nuclear commitments, as well as to deal with any exceptional events that may arise.

Criticality in view of the control actions undertaken: Moderate.

The EDF group was able to meet its financing needs by conservative liquidity management, and has obtained financing on satisfactory terms.

The Group's ability to raise new debt, refinance its existing indebtedness or, more generally, raise funds in financial markets, and the conditions that can be negotiated to this effect, depend on numerous factors including the rating of the Group's entities by rating agencies. The Group's debt is periodically rated by independent rating agencies. Any downgrading of EDF's debt rating could increase the cost of refinancing existing loans and have a negative impact on the Group's ability to obtain financing. To meet liquidity needs, the Group has a significant cash reserve. Hybrid emissions may be considered. To this end, on 8 September 2020, EDF issued bonds with an option to convert and/or exchange them for new and/or existing green shares ("Green OCEANEsbonds") for a par value of €2,400 million and an issue value of €2,569 million.

Furthermore, a range of specific levers are used to manage the Group's liquidity risk:

- the Group's cash pooling system, which centralises cash management for controlled subsidiaries. The subsidiaries' cash balances are made available to EDF SA in return for interest, so as to optimise the Group's cash management and provide subsidiaries with a system that guarantees them market-equivalent financial terms;
- centralisation of financing for controlled subsidiaries at the level of the Group's Cash Management Department. Changes in subsidiaries' working capital are financed by this Department in the form of stand-by credit lines provided for subsidiaries, which may also be granted revolving credit from the Group. EDF SA and the investment subsidiary EDF Investissements Groupe (EDF IG), set up in partnership with the bank Natixis Belgique Investissements, also provide medium and long-term financing for EDF group operations outside France, arranged by EDF SA and EDF IG on a totally independent basis: each company sets its own terms, which are the same as the subsidiary would have in an arm's-length market transaction;
- active management and diversification of financing sources used by the Group: the Group has access to short-term resources on various markets through programmes for French commercial paper (*billets de trésorerie*) and US commercial paper. For EDF, the respective ceilings for these programmes are €6 billion for the NeuCP programme and $10 billion for its US commercial paper;
- the repurchase of bond debt securities with bank counterparties for cash;
- liquidity requirement analyses were updated during the crisis in March and at the end of 2020, showing potentially increased requirements as a result of the consequences of the health crisis. EDF chose to resort to repurchase agreements at the time of the March crisis, which created significant liquidity. These measures were gradually phased out starting in the summer of 2020.

2.2.3 Group transformation and strategic risks

3A – Transformation capacity in the face of disruptions.

The Group's development strategy, changes in the scope of activities and synergies within the Group, risk not being implemented in accordance with the objectives defined by the Group, even though it faces increased competition on European energy markets, particularly on the French electricity market, which is its main market.

Criticality in view of the control actions undertaken: Intermediate.

In France, since 1 July 1 2007, the electricity market has been totally open to competition. All EDF customers can select their electricity supplier (see section 1.4.2.1 "Presentation of the market in France"). In a context of escalating competitive intensity (new customer expectations, new regulations, emergence of new players, mergers between existing operators, changes in market prices, etc.), these changes, at constant consumption and price levels, have had and may have in the future a negative impact on the Group's sales in France. EDF must therefore adjust its marketing expenses; insufficient adjustment could have a negative impact on its profitability. In addition, the Covid health crisis could have an impact on demand and weaken the economy, which could result in unpaid or uncollectable debts. Elsewhere in Europe, the Group faces different situations, depending on the local competitive conditions (totally or partially open markets, position of competitors, regulations, etc.). The type of competition faced by the Group, the evolution over time of such competition and its effect on the Group's activities and results vary from one country to another. These factors depend in particular on the market depth and its regulations in the country in question and on other factors over which the Group has no control.

In this context, particularly following the development of low-carbon electricity uses and energy services and energy efficiency, the Group may not be able to defend its market share, to reach its downstream low carbon goals, or gain market shares as expected, or it may see its margins decrease, which would have an adverse effect on its activities, its strategy and its financial position.

Furthermore, the Group, in line with its *raison d'être* and its CSR commitments, intends to continue its development as a high-performance and responsible electricity company, championing low-carbon growth in France, in its core countries in Europe (United Kingdom, Italy, Belgium) and in other countries where the Group operates in accordance with the CAP2030 strategy. This strategy combines the search for growth drivers with the promotion of existing assets. The strategy and drivers of the Group's transformation are described in section 1.3 "Group Strategy and objectives".

Weak synergy in the deployment of the Group's model, particularly upstream/downstream integration or in the enhancement of the complementarity of the divisions and the diversity of the solutions deployed by the Group, (see section 1.4 "Description of the Group's activities"), could lead to an increase in risks related to physical and market contingencies, and to a loss of gross margin, to the detriment of customers, subsidiaries and the Group's performance. In addition, insufficient emphasis on geographic diversification, or on the diversification and complementarity of the low-carbon industrial solutions offered by the Group, or a reduction in the cross-functional synergies deployed within the integrated Group could reduce the Group's ability to deal with the seasonal nature of the electricity generation and sales business, the diversity of local expectations and the proximity of its customers and stakeholders, and the efficiency and therefore the competitiveness of the low-carbon industrial solutions implemented.

The Group is implementing development, adaptation and transformation programmes and performance plans in order to give itself the means to carry out its strategy. These programmes may be complemented by a strategic analysis of assets which may itself lead to a requirement for additional financial agility, giving rise to disposals or acquisitions.

Focused primarily on its customers and stakeholders, the Group intends to develop and consolidate its offer of integrated service solutions, in particular energy efficiency and carbon-reduction services, its offer of low-carbon and decentralised power generation solutions, and its offer of diffuse storage solutions, in a sustainable development approach and in close proximity to customers and local communities. This transformation may not be sufficient or innovative enough in the face of technological and societal changes and strong competition.

The Solar Plan, the Electric Storage Plan and the Electric Mobility Plan are three major levers for developing and expanding the range of low-carbon energy solutions offered by the Group in addition to the generation plants already widely available within the Group, particularly wind, solar, hydro and nuclear power.

Moreover, there is a risk of not seizing new opportunities (Hydrogen development, renovation projects) in the context of the recovery plan (France, Europe).

Even in the event of protective contractual arrangements, the Group cannot guarantee that these various projects relating to its offer or to the various low-carbon industrial solutions deployed to meet them can be implemented according to the forecast schedules and under satisfactory economic, financial, regulatory, partnership or legal conditions or that they will ensure a long-term response to the needs expressed by our customers and stakeholders and the expected profitability at the outset, which could have a negative impact on the Group's financial position, its commitment to the fight against climate change, and its reputation.

Nuclear costs and changes in these costs (new nuclear projects, major *Grand carénage* refurbishment projects, etc.) and the Group's ability to finance them could force the Group to reconsider the rate at which it deploys its strategy.

To achieve its strategic transformation objectives, the adaptation programs implemented by the Group rely largely on individual and collective employee mobilisation. However, this mobilisation may not be sufficient due to an industrial relations environment which has deteriorated as a result of the changes linked to these adaptations affecting in particular the Group's organisation, or linked to more general developments (health crisis).

3B – Adaptation to climate change: physical and transition risks.

The Group is exposed to physical effects of climate change that could have consequences on its own industrial and tertiary facilities and more generally on the Group's financial position. The societal, technological and economic context may not be favourable to the Group's low-carbon solutions.

Criticality in view of the control actions undertaken: Intermediate.

Physical risks

EDF group facilities are closely linked to water, wind and solar resources; the overall reliability of the power system depends on the resilience to climatic conditions of generation facilities and distribution and transmission network infrastructures. As a result of this sensitivity to climatic conditions, the EDF group's activities are likely to be significantly affected by the physical effects of climate change, both in terms of chronic effects and an increase in the frequency and intensity of extreme climatic events. To address these risks, the Group's operating entities must regularly update their climate change adaptation plans, based whenever possible on IPCC scenarios, in order to review the measures taken and to be taken. In addition, periodic reviews are carried out on nuclear and hydraulic installations, incorporating both feedback and climate change projections; this is a key cornerstone of the robustness of the installations. Since the 1990s, the EDF group has been building up specific R&D expertise on climate change issues, invested in collaborative academic research projects to support these actions.

However, the effects of climate change present many uncertainties. Despite the actions taken by the EDF group, they could adversely affect the continuity of the Group's business, its operating results, its cash flows and more generally its operating performance. In addition, renewing or taking out these specific insurance covers may be difficult or expensive due to the impact, frequency and magnitude of natural disasters experienced in recent years.

Transition risks

The EDF group's *raison d'être*, adopted in May 2020, centres on the objective of "building a CO_2-neutral energy future". Most of the Group's investments are oriented towards this environment-friendly low-carbon strategy (see section 3.1.1.4"EDF, Europe's biggest investor in carbon-free energy"). In 2018, the Group had already made a commitment to significantly reduce its carbon dioxide emissions, with a target of 30 million tonnes in 2030 instead of 51 million tonnes in 2017 (40% reduction). The EDF group also confirmed this goal in 2020 by joining the "Business Ambition for 1.5 degrees" initiative. The EDF group is making new commitments to achieve carbon neutrality by 2050, both in direct and indirect emissions (scopes 1, 2 and 3), with milestones set for 2023 and 2030. The SBTi organisation certified this approach in 2020 as going beyond the 2°C set out in the Paris agreement. Thus, for the first time the EDF group has set reduction targets for its indirect emissions, covering in particular the emissions associated with the sale of gas to end customers (See section 3.1.1 "Group carbon trajectory"). All of these actions help to control the transition risk.

Achieving the objective of reducing emissions and, more generally, ensuring the success of the Group's low-carbon strategy depend primarily on the continued acceptance of nuclear energy by the public, the successful shutdown or adaptation of fossil fuel power plants and the accelerated development of renewable generation resources to complement nuclear and hydroelectric generation. The Group has been particularly active in the development of solar energy in France, electric storage and low-carbon electric mobility, which will make it possible to develop and promote the Group's low-carbon energy solutions, particularly for the transport sector, which still emits a very high level of carbon dioxide in France and Europe.

Thus, the EDF group's strategy and energy mix are fully in line with the public low-carbon transition policies, which give EDF the opportunity to enhance the value of all its investments and activities. Nevertheless, this opportunity could be stalled by the external, societal, competitive, social, economic, or industrial context. Nuclear energy may not be recognised at the societal level as a key factor in enabling the low-carbon transition. For example,

- the standards or taxonomies currently being put in place to recognise decarbonised energies could include criteria that would de facto exclude nuclear energy, which would be a very significant risk for EDF and more generally for the achievement of national and European emission reduction objectives. See in particular risk no. 1A above "Changes in public policies in France and Europe";
- in connection with the preparation of the 2019-2028 Multi-Year Energy Programme, the French government wished to review several scenarios between 2030 and 2050, "ranging from a 100% renewable scenario to one in which nuclear power remains a sustainable source of electricity generation integrated into the mix for reasons of production management and competitiveness".

In addition, new low-carbon energy solutions may induce new societal questions (new intrusive technologies, land rights-of-way, new conflicts related to the use of water or scarce resources, etc.). New legislative or regulatory changes brought about by climate change could also have a negative impact on EDF's business and lead to new legal or compliance risks. The Group may also have to deal with the emergence of new technologies or disruptive solutions that are part of the efforts to meet the transition objectives.

Such situations could make it more difficult to carry out these transformations and achieve the desired objectives. They could directly or indirectly affect the Group's business volumes, margins, asset value, financial position, reputation or prospects.

Risk summaries and mapping

In 2019, a summary on climate change and its impacts on EDF was presented to EDF's Scientific Council (see section 3.1.3.2 "Implementation of Task Force on Climate-related Financial Disclosures (TCFD) recommendations"). A Group-wide climate risk mapping of all physical and transition risks was also established following the recommendations of the TCFD (Task Force for Climate Financial Disclosures, see section 3.9.4 "Summary of EDF group climate risks"). Climate risks have been identified and assessed using the Group's general risk mapping method. In 2020, this mapping of climate risks, based in particular on the adaptation plans of the operating entities and on the report to the Scientific Co/uncil, has led to a "resilience" action plan mobilising the Group at both corporate and entity levels. It was examined by the Audit Committee. A detailed description of this risk mapping is given in section 3.9.4.

3C – Adaptation of employees' skills.

Skill adaptation and development may be insufficient in view of the Group's transformation, business line requirements and new organisational and working methods.

Criticality in view of the control actions undertaken: Intermediate.

In an environment impacted by the energy and digital transitions, the scope of the Group's activities is changing. New business lines are developing, working methods are changing (empowerment, collective intelligence, operating on project platforms, increased distance working, etc.).

Although the action plans implemented to date have made it possible to control the evolution of the workforce and the adaptation of skills, there is a continuing risk of skills mismatch in the coming years, in this context of transformation.

Risk management is based on matching skills to short-, medium- and long-term needs, on supporting the employability of employees and on managing internal mobility more fluidly. In this regard, the actions undertaken since 2018 relate to:

- anticipating the future, by analysing forecast needs in terms of resources and skills in the short/medium term (GPEC [1]) and the longer term (Prospective);
- pursuing an ambitious approach to skills development through traditional training and the development of professional skills development initiatives;
- developing the employability of employees in order to facilitate their professional development and changes of profession;
- creating the conditions for internal mobility within the Group;
- implementing an external recruitment policy, targeting the skills of tomorrow that are not available on the internal job market – for which the EDF group is one of the leading recruiters in France – and (ii) an inclusive employer approach favouring sourcing *via* work-study and end-of-study internships, with a specific focus on candidates from *zones de revitalisation rurale* (ZRZ) (rural revitalisation zones) and *quartiers politiques de la ville* (QPV) (urban political districts);
- enhancing external career paths as a lever for acquiring new skills (PAME [2], CCE [3]) and "win-win-win" career ends (employee, company, territory) through senior skills sponsorships;
- nurturing a sustained social dialogue, in order to ensure that the trade union organisations have a good understanding of the employment and skills policies.

Obtaining experience may require several years and sufficient coverage for the transfer of knowledge and experience. In 2020, as part of the EXCELL plan in particular, the Group launched a system of knowledge management which should make it possible to secure skills in the nuclear field.

The EDF group considers the dynamic matching of skills to needs to be a major challenge and therefore implements the appropriate measures to facilitate change.

However, it cannot guarantee that the measures taken will always be sufficient or on satisfactory terms, which could have an impact on its business, financial position and reputation as an employer.

3D – Ability to ensure long-term social commitments.

The Group may be required to meet significant commitments related to pensions and other employee benefits.

Criticality in view of the control actions undertaken: Intermediate.

The pension plans applicable in the various countries in which the Group operates involve long-term commitments to pay benefits to the Group's employees (see note 16 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020). In France, in addition to these pension commitments, the Group also owes obligations for post-employment benefits and long-term benefits for employees currently in service. The ongoing pension reform in France may have an impact on the Group's commitments.

At 31 December 2020, the average duration of employee benefits commitments was 20.6 years in France and 23.5 years in the United Kingdom.

In order to cover these commitments, the Group has set up pension funds in the United Kingdom, where coverage of commitments is a regulatory obligation, and outsourced funds in France, which provide partial coverage of commitments.

The amounts of these commitments, the provisions booked, the outsourced funds or pension funds set up and the additional contributions required to make up insufficient funding are calculated based on certain actuarial assumptions, including a discount rate subject to adjustment depending on market conditions and, in the event of any employee-related commitments in France, on the rules governing retirement benefits paid out by the general retirement scheme, and amounts owed by the Group. These assumptions and rules may be adjusted in the future, which could increase the Group's current commitments for pensions and other employee benefits and, therefore, require a corresponding increase in provisions.

Furthermore, if the value of pension funds in the UK proves insufficient to meet the corresponding commitments, primarily due to calculation assumptions or developments in the financial markets, the Group may be obliged to make additional contributions to the relevant funds, which may have an adverse impact on its financial position.

(1) GPEC: Employment and Career Planning.
(2) PAME: External Mobility Guidance.
(3) CCE: Company Creation Leave.

2.2.4 Operational performance

This section describes the most significant risks related to the control of the Group's operating activities across its various industrial activities and projects, including EPR.

Failure to achieve the expected operating results may lead to a direct deterioration in the Group's financial position, reputation and ability to transform.

4A – Management of large and complex industrial projects, including EPR projects.

The Group carries out very large-scale projects. These projects represent a major risk for the Group in terms of the potential financial impact on its shareholders' equity and implications for its development strategy. In particular, the success of EPR projects depends on specific industrial, regulatory and financial factors.

Criticality in view of the control actions undertaken: Strong.

As part of its activity and in its capacity as project owner or prime contractor, the Group is called upon to carry out projects that are very complex, require significant investments and lengthy procedures for construction and regulatory approvals.

The most significant projects in progress concern the completion of large-scale nuclear projects and primarily EPR projects. These projects entail a major risk for the Group.

Other ambitious projects may involve, in France or internationally, offshore facilities for new energies (off-shore wind power in France), the installation of new meters (Linky in France, handled by Enedis) on an entire distribution network concerning tens of millions of customers, in France or the United Kingdom, the implementation of hydraulic projects, or large scale projects relating to the existing nuclear facilities (*Grand Carénage* project and decommissioning projects).

Complex projects subject to numerous uncertainties

The implementation of these projects may give rise to numerous technical, industrial, operational, economic, regulatory, political, environmental or acceptability risks that could jeopardize project schedules, associated costs or profitability.

These projects are large-scale and long-duration projects; they involve numerous industrial partners. There may also be difficulties in terms of relationships with the partners involved with EDF in these projects. For example, trade tensions between the United States and China could have an impact on the conduct of some of these projects given the technologies and partnerships implemented (see risk 4E). Tensions between the United Kingdom and China, and changes in the strategy of our Chinese partner, could in particular weigh on the development of the partnership with CGN.

The health crisis has notably affected the deployment of these major projects and could, if it were to worsen, lead to delays or additional costs, linked in particular to public health requirements that might be imposed (social distancing, curfews, etc.).

Financing and authorisations for major projects

These projects require, among others, administrative authorisations, licenses or permits which may be subject to disputes, withdrawals or delays in obtaining them.

They also involve significant investments, for which the financing and pricing conditions may still be subject to confirmation or modification. Given the economic, sanitary or institutional climate or depending on the appropriate progress of the pending projects, obtaining such funding may be delayed.

To date, the legal framework relating to the European taxonomy for sustainable finance (draft delegated act on taxonomy) proposed by the Commission does not include nuclear power, which is dealt with in a specific process. If this process were to result in the exclusion of nuclear power, this would be seriously detrimental to the Group's ability to finance future major nuclear projects (see risk 1A).

CSR issues

A very large number of stakeholders may be involved in these projects which may, for example, need to be associated with territorial development projects or suffer from difficulties related to local acceptance. In order to improve this project control, the Group has embarked on an overhaul of its project management and has defined a "Commitments" policy that requires an analysis to be carried out of the associated risks and security issues. This project management takes into account, in accordance with EDF's vigilance plan, the potential impacts of projects on human rights, the environment, health and safety, as well as the CSR issues of dialogue and consultation with stakeholders, territorial development, development of industrial sectors, ethics and responsible land management (see sections 3.2, 3.3, 3.4 and 3.6).

Performance

The success of the EPR projects, in particular, will determine the future of the nuclear industry. As such, it represents a key issue for the Group. Since December 2019, the Group has been implementing the Excell plan, which aims to enable the French nuclear industry to successfully complete its nuclear projects (see section 1.4.1.1.1.).

Such situations could, in particular in the event of non-compliance with the Group's contractual commitments or the Group's potential exposure in the event of major contingencies arising from the completion of these projects or the operation of these reactors, have a major impact on the Group's business, results, asset value, financial position, reputation, organisation and outlook.

Operational control of EPR projects

France

EPR Flamanville 3

The Flamanville 3 project (see section 1.4.1.1.3.1 "Flamanville 3 EPR project") is a major industrial, regulatory and financial challenge for the Group. In particular, meeting the timetable and cost objectives is still dependent on:

- implementing the action plan on a hundred welding seams to be reworked on the main secondary circuit piping (VPP and ARE [1]), as well as those of the 8 containment crossings for which ASN has requested immediate repair. For these penetration weld repairs, the preferred option of reworking by remotely-operated robots could run into difficulties, particularly in view of the innovative nature of this option and the delay in the appraisal by the ASN. On this point, the ASN authorisation is currently expected to be issued in the first quarter of 2021. The repairs to all these welds are critical to the completion of the EPR project within the target schedule;
- the documentary or corrective actions under study and their validation by the ASN following the incomplete observance of the 2006 study handbook for the location of the installation of three noozles on the main primary circuit in respect of which a significant event was declared to the ASN on 2 March 2021;
- the re-testing by sampling prescribed by the ASN on the welds of the main primary circuit;
- the successful completion of the start-up tests still to be carried out and the transfer of all the systems to the operator;
- obtaining the various authorisations that must still be issued by the ASN, in connection with the examination of the technical files related to EPR licensing. In this context, a decree of 25 March 2020 extended the maximum time limit for commissioning the reactor to April 2024;
- the ageing of equipment and materials due to the duration of the work;
- the emergence of any other risks, including while the works are continuing.

In a press release dated 9 October 2019, the Group noted that the provisional timetable for implementing the preferred scenario for reworking the feedthrough welds, subject to validation by the ASN of this scenario and the date on which it would be implemented, meant that the fuel could be loaded at the end of 2022. At the end of 2020, a review of the impact of the first lockdown on the construction site did not lead to a change in the fuel loading date and construction cost targets announced in October 2019, but showed that there is no longer any leeway for the project, either in terms of schedule or cost.

(1) VVP: Main Steam System – PWR; ARE: water supply circuit for steam generators

Meeting these targets remain dependent on many factors, in particular the investigations conducted by the ASN, notably regarding the procedures envisaged by EDF for dealing with the welds in the main secondary system. The postponement of the ASN's approval of the process for repairing crossing welds using remotely operated robots until the first quarter of 2021 poses an additional risk to the project's completion cost and schedule.

The risk relating to the schedule and completion cost is therefore very high and the project could face other potentially significant additional costs and delays in the event of new contingencies, in particular in the event that it ultimately proved necessary to halt the crossing weld repairs (EDF does not consider this to be a preferred scenario).

The construction cost to completion of €12.4 billion is expressed in 2015 euros and does not include interim financial interest. As this is a construction cost, it also does not include other elements necessary for the project such as spare parts for the subsequent operation of the plant, or the cost for replacing the vessel. The amount of interim interest as shown in the financial statements at the end of December 2020 amounts to €3,291 million. The additional costs compared to the previous estimate of €1.5 billion 2015 are mainly recognised in other operating income and expenses [(1)] and not in investments. For 2020, these additional costs recorded in other operating income and expenses amounted to €397 million.

Furthermore, these amounts correspond to costs incurred as of 31 December 2020, and not to costs anticipated to be incurred as at the fuel loading date scheduled for the end of 2022.

Renewal of the French nuclear fleet – EPR2

Studies for the EPR 2 Project are underway in order to propose a competitive reactor with a view to partially renewing the existing nuclear fleet. Failure to meet the competitiveness target, the absence of an appropriate regulatory framework or the failure to obtain, or delays in obtaining, the necessary permits to continue the reactor's development could have an impact on the Group's financial position (see section 1.4.1.1.3.2 "Other "New Nuclear" projects).

On 25 January 2019, the French government published the main guidelines of the Multi-year Energy Programme adopted by a decree of 21 April 2020. In accordance with these directions, the government has asked EDF to prepare a comprehensive file with the nuclear industry by mid-2021 relating to a programme of renewal of nuclear facilities in France. The sector contract signed on 28 January 2019 by the French government and the Nuclear Sector Strategic Committee (CSFN) contains a section on the preparation of the industrial capacity necessary for the performance of a programme of construction of new reactors in France. In order to keep in line with this initiative, EDF has started to prepare economic and industrial proposals based on the EPR2 technology. EDF will provide the information to enable the French government to define an appropriate regulatory framework for the financing of such an industrial programme.

On 8 December 2020, the French President stated that "the final decision on the construction of new reactors must be taken by 2023 at the latest, once the Flamanville EPR has been commissioned". Further delays in the commissioning of the Flamanville 3 EPR, a further postponement of the decision or a decision not to build these reactors could impact the Group's financial situation.

China

Taishan EPR

In China, the Group has a 30% stake in TNPJVC (Taishan Nuclear Power Joint Venture Company Limited) alongside its Chinese partner CGN and Guangdong Energy Group (19%). Taishan 1 and Guangdong Energy Group (19%) was the first EPR reactor to be coupled to the grid on 29 June 2018. It was commissioned on 13 December 2018. The Taishan 2 reactor became commercially operational on 7 September 2019 (see section 1.4.1.1.3.2). The feed-in tariff for the electricity generated by Taishan has been set at RMB435/MWh (approximately €56/MWh) for at least 7,500 operating hours per year per reactor, with any surplus being sold at market price. The tariff is lower than expected by EDF. Taishan depends on the state-owned grid operator China Southern Power Grid for regulation between the different generation units. The first tariff and capacity call conditions, which are very important for the economic performance of the plant, are in force until the end of 2021. Together with CGN, efforts are continuing with the relevant Chinese authorities, who will determine the new tariff conditions. The profitability of the asset is also subject to the risk of changes in the volume of sales at this tariff, against a background of development in the electricity market.

United Kingdom

In the UK, the new environment created by implementation of the Brexit (see section 1.4.5.1.2.4) may lead to a change in the implementation and profitability conditions of projects and to reassessing or even discouraging investors associated with the Group's future projects in the United Kingdom or Europe. The agreement of 24 December 2020 could generate disruptions impacting ongoing projects. However, the Group' preparations for this new situation could limit its exposure to this risk as well as limit the extent of any impact (see section 1.4.5.1.3).

Hinkley Point C - EPR

Control of the design and bringing the manufacturing and the major milestones of the Hinkley Point C construction site under control will determine the profitability of the project and the financing of any future projects in the United Kingdom. The Group has a 66.5% stake in the Hinkley Point C Project, alongside its Chinese partner CGN with 33.5% (see sections 1.4.1.1.3.2 "Other "New Nuclear" projects" and section 1.4.5.1.2.5 "Nuclear New Build Business").

In June 2019, the HPC project achieved milestone D-0 (completion of the Unit 1 Nuclear Island Riser) as planned. The Unit 2 Riser was completed in line with the targets in June 2020.

A detailed review of schedule and cost was concluded at the end of January 2021 to estimate the impact of the pandemic so far. This review has concluded the following [(2)]:

- the start of electricity generation from Unit 1 is now expected in June 2026, compared to end-2025, previous target initially announced in 2016;
- the project completion costs are now estimated in the range of $£_{2015}$22 to 23 billion [(3)]. As a consequence, the projected rate of return (IRR) for EDF (different from the project's IRR) is estimated between 7.1% and 7.2% [(4)] [(5)];
- the risk of COD delay of Units 1 and 2 is maintained at respectively 15 and 9 months. The realisation of this risk, for which the level of probability remains high, would incur a potential additional cost in the order of $£_{2015}$0.7 billion. In this case, the IRR for EDF would be reduced by 0.3%.

The agreements between EDF and CGN include a capped compensation mechanism between both shareholders in case of cost overruns or delays. Given the expected level of completion costs, this mechanism is applicable and will be triggered when the time comes. EDF's published IRR takes this compensation [(6)] mechanism into account. These agreements are part of a Shareholders'Bilateral agreement signed between EDF and CGN in September 2016 and are subject to a confidentiality clause.

(1) IAS 16 paragraph 22 on abnormal costs incurred in connection with assets constructed by the Company. These costs will affect the years 2020, 2021, and 2022.

(2) Assuming the ability to begin a ramp up back to normal site conditions from the second quarter of 2021. Please refer to the Press release of 27 January 2021 "Hinkley Point C project update".

(3) Reminder on the costs previously announced in the Press release of 25 September 2019: £201521.5 – 22.5 billion. Costs net of operational action plans, in 2015 sterling, excluding interim interest and excluding forex effect versus the reference exchange rate for the project of £1 = €1.23. Costs calculated on 27 January 2021 (see press release "Hinkley Point C project update") by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index.

(4) EDF equity IRR calculated at the exchange rate of £1 = €1.13 and including the capped compensation mechanism in place between the project's shareholders. Previous IRR of 7.6% - 7.8% was based on an exchange rate of £1 = €1.15 .

(5) Beyond the cost and construction time objectives, this IRR for EDF includes other structuring assumptions. In particular, it is sensitive to inflation rate assumptions and electricity price assumptions after the CfD period: a 0.1 point change in inflation has an impact of 0.1% on the IRR, a change in electricity prices of £201510/MWh has an impact of 0.1% on the IRR.

(6) EDF equity IRR calculated at the exchange rate of £1 = €1.13 and including the capped compensation mechanism in place between the project's shareholders. Previous IRR of 7.6% - 7.8% was based on an exchange rate of £1 = €1.15

The project's financing needs will exceed the shareholders' contractual commitment by the end of construction, which will lead the Group to assume, by the end of construction, a portion of the financing needs that is greater than its share which would lead to difficulties in financing the project in the event of a shareholder misalignment.

The project's IRR is also sensitive to the exchange rate and could be reduced in the event of a significant fall in the pound sterling against the euro, in particular as a result of the implementation of the Brexit mentioned above; it could also be sensitive to inflation and electricity market prices [(1)]. Finally, the governance of the project could also be affected in the event of misalignment between shareholders. Changes to these different factors could have a significative impact on the Group's financial position.

Sizewell C

EDF has also signed two other agreements with CGN relating to two nuclear projects in the United Kingdom: Sizewell C and Bradwell B (see section 1.4.5.1.2.5 "Nuclear New Build Division").

During development phase previous to final investment decision, EDF's share is of 80% and CGN of 20%. EDF has planned to pre-finance the development up to its share of an initial budget of £458 million. Final investment decision is likely to be made by mid-2022. If it is postponed, an agreement should be reached on the financing of the additional costs incurred.

This project is based on the assumption that third party investors will invest a very large majority and EDF plans, at the date of the final investment decision, to become a very minority shareholder with corresponding limited rights and to deconsolidate the project from the Group's financial statements (including in the calculation of economic indebtedness by the rating agencies). At this stage, it is not certain that the Group will achieve this objective.

This financing model has never been implemented for projects of that scale before and therefore would be one of the largest ever equity issuance and project financing on the European market. Securing the appropriate risk-sharing mechanism and ultimately the corresponding financing structure ahead of the Final Investment Decision is therefore key for the project, the UK Government and the current shareholders. EDF's ability to make a final investment decision on Sizewell C and to participate in the financing of this project beyond the development phase could depend on the operational control of the Hinkley Point C project, on the existence of an appropriate regulatory and financing framework, and on the availability of sufficient investors and financiers. None of these conditions are guaranteed at this time.

The British government announced on 14 December 2020 that it was entering into discussions with EDF regarding the financing of Sizewell C.

Failure to obtain the appropriate financing framework and appropriate regulation could lead the Group not to take the investment decision or to take a decision under less than optimal conditions.

Bradwell B

With regard to the Bradwell B project, the assessment by the Office for Nuclear Regulation of the generic design of the UK HPR1000 (UK Hualong) reactor model is underway and the development of this technology at the Bradwell B site in the UK may be impacted by this process. In January 2021, following an initial assessment of the generic design, the Environment Agency published conclusions stressing that this design has many environmentally acceptable elements, but that certain issues relating to heating, ventilation and air-conditioning systems, radioactive waste disposal methods and the use of feedback from the preparation of the various safety cases during the project must be addressed by the project. The Environment Agency expects to complete its design assessment of the Bradwell B project in early 2022.

Insofar as the projects Sizewell and Bradwell involve EDF and CGN, they are likely to be impacted by changes in diplomatic relations between the United Kingdom and China.

India

Jaitapur

Following the signature in March 2018 with NPCIL (Nuclear Power Corporation of India Limited) of a non-binding Industrial Way Forward Agreement (IWFA) for the construction of six EPR-type reactors at the Jaitapur site, in India, with a total power of around 10GW, in accordance with the timetable set by the IWFA, EDF and its partners submitted a complete non-binding conditional offer to NPCIL at the end of 2018. In this offer, the EDF group and its partners will supply all the studies and equipment for the nuclear island, the conventional island, the auxiliary systems as well as the heat sinks and galleries of the EPR technology. EDF will not invest in the project and the NPCIL client will be the overall project manager and integrator in the implementation phase (bearing in particular the risks of licensing, construction, assembly and overall integration). (see section 1.4.1.2.2 "Other "New Nuclear" projects" and section 1.4.5.3.6.2 "South-East and South Asia). In 2020, the technical and commercial convergence process continued with NPCIL to enable EDF to submit a binding technical and commercial offer in the first half of 2021, subject to the establishment of a satisfactory nuclear civil liability framework. At the end of 2020, there was still a lack of convergence on some significant technical-commercial subjects. EDF aims to sign a General Framework Agreement in the months following the submission of the tender, which would allow project implementation activities to be launched.

The project has the risk profile of a supplier of engineering services and equipment supplies; its value therefore lies in the realisation of the margin included in the price of the services sold. Like all large complex industrial projects, this project presents technical, industrial and cost control risks for the scope under the responsibility of EDF and its partners, as well as a risk relating to compliance with pre-defined milestones, particularly with regard to the expected revenue model. In addition to the country risk, the conditions related to the nuclear civil liability framework in India and the securing of the project's financing plan must be resolved before the final contracts are signed.

Framatome

A fundamental element for the success of an EPR project and for the operating safety of EPR reactors in which the Group is involved is accounting for the needs of the final operator, who is responsible for operational safety, from the beginning of the design phase and throughout the design and implementation of the EPR project.

Framatome can expose the Group through its activities for other nuclear operators or customers in France and abroad. Group exposure may be financial or involve the Group's reputation. Framatome's industrial performance remains strategic for EDF Nuclear Operator in France and the United Kingdom. The successful completion of an EPR project depends on quality and compliance with contractual clauses in Framatome's production of studies, components or services for each EPR Project.

In 2020, Framatome continued the action plan aimed, through studies and tests, at identifying and dealing with the deviations observed in 2019 in the stress relieving heat treatment processes used to weld primary or secondary circuit components. With the approval of the safety authorities of the countries in question, the units affected by these deviations continued to operate and a procedure was agreed with the French authority to deal with deviations relating to equipment in the course of manufacture. To date, Framatome has not received any formal complaint from its customers.

Framatome's integration into the EDF group assumes that new nuclear reactor projects will be developed in France and abroad and aims to develop synergies to enhance the attractiveness of the French offer. Failure to achieve these objectives could jeopardise the competitiveness of the nuclear sector in France and that of the Group in its international development, and the success of all EPR Projects.

Other issues and risks specific to nuclear activities, whether in terms of nuclear safety, control of operation and maintenance operations, long-term commitments or the fuel cycle, are specified in section 2.2.5 "Specific risks related to nuclear activities".

(1) beyond the CfD period.

4B – Hydraulic safety violations.

The hydroelectric facilities operated by the Group present risks with potentially serious consequences for people, property and the environment that could have a financial and reputational impact on the Group.

Criticality in view of the control actions undertaken: Intermediate.

The Group's hydraulic structures present specific risks with potentially very serious consequences: breakage, overflow during floods, operating manoeuvres. Hydropower safety comprises all the measures taken when designing and operating plants to reduce risks and hazards to people and property associated with water and the presence or operation of facilities. Hydropower safety is the major and permanent concern of the producer. It falls under the purview of the Group's CSR "nuclear safety, health and security" issue (see section 3.3.1). It involves three main activities:

- measures to address the major risk associated with dam or reservoir failures, through the regular monitoring and maintenance of facilities under the supervision of public authorities, mainly the French regional environment, land use and housing authorities (Directions Régionales de l'Environnement, de l'Aménagement et du Logement – DREAL). Of the largest dams, 67 of them are subject to a special administrative procedure implemented by the competent prefect;
- the management of facilities during periods of exceptionally high water levels, in order to ensure safety at the facilities and for the surrounding communities;
- control of operational risks: changes in the level of the water bodies or the flow of watercourses downstream of the works.

EDF regularly monitors and maintains its dams, including through continuous monitoring. The real-time readings and analysis, at each site, of multiple data (settlement, pressure, leakage measurements, combined with the visual inspection of the concrete and an inspection of the mechanical parts, etc.) enable EDF to conduct a regular assessment on the state of its dams. In Grenoble and Toulouse, EDF teams can analyse the largest dams or those dams that are the hardest to access, remotely and in real time, using a series of sensors.

Furthermore, for each of the large dams, a danger study, including a complete examination, is conducted every ten or fifteen years (for one class A dam and one class B dam respectively). This examination requires draining or an inspection of the submerged parts with sub-aquatic equipment. These operations are carried out under the strict control of the French State authorities (Service de Contrôle et de Sécurité des Ouvrages Hydrauliques (Hydraulic Works Control and Safety Department) within each DREAL (French regional environment, land use and housing authority)).

At the organisational level, the Hydropower Safety Inspector prepares an annual report for the Chairman and CEO of EDF, to which he or she reports directly, as well as to those involved in hydropower safety (see section 1.4.1.3.1.3 "Hydropower safety"). Issued after analyses, inspections and assessments carried out by the Hydropower Safety Inspector, this report aims to give an opinion on the level of hydropower safety of the Group's installations and provide a basis for reflection and progress to ensure its improvement and consolidation. This report is made public on the Group's website.

4C – Occupational health or safety violations (employees and service providers).

The Group is exposed to health and safety risks in the workplace, both in terms of its employees and those of its service providers.

Criticality in view of the control actions undertaken: Intermediate.

Human resources and their related skills are a major challenge for the Group and its service providers. The industrial nature and diversity of the Group's activities reinforce the crucial importance of complying with the rules and taking into account the various risks that may affect people working in the Group's industrial facilities in order to protect health and safety in the workplace.

The risk of work-related accidents or occupational illnesses cannot be excluded in all of the Group's areas of activity. The occurrence of such events may lead to lawsuits against the Group and may result in the payment of damages, which could be significant.

To address this risk, the Group has for many years taken the steps necessary to comply with the health and safety laws and regulations in the various countries in which it operates, and considers that it has taken the measures required to ensure the health and safety of its employees and that of its subcontractors.

Each Group entity has action plans aimed at continuously improving health and safety at work. Actions are also carried out at the level of the Group as a whole: defining and promoting vital rules, the day-long shutdown on 20 October 2020 to jointly discuss the persistence of fatal accidents (see section 3.3.1.3 "Health and safety of employees and subcontractors").

4D – Attacks against assets, including cyberattacks.

The Group is exposed to risks of failure of or damage to its tangible or intangible assets, including its information system. In particular, these risks may arise from malicious actions, including cybercrime.

Criticality in view of the control actions undertaken: Intermediate.

The facilities or assets operated by the Group or its employees may be the target of external attacks or malicious acts of any kind. An attack or malicious act committed on these facilities could have consequences such as injury to persons and/or damage to property, the Group being held liable on the grounds of measures judged to be inadequate and interruptions to operations. The Group would also be forced to make additional investments or incur additional costs if laws and regulations relating to the protection of sensitive sites and critical infrastructures became more stringent.

The Group operates multiple, interconnected and complex information systems (databases, servers, networks, applications, etc.) that are essential to the conduct of its commercial and industrial activity, the preservation of its human, industrial and commercial assets, and the protection of personal data (of customers and employees) which must adapt to a rapidly changing context (digital transition, development of teleworking, new ways to share work in extended companies with suppliers, changes in regulations, etc.).

The frequency and sophistication of information system hacking and data corruption incidents are increasing worldwide. The impact of a malicious attack – or any other failure resulting in the unavailability of information systems – may have a negative impact on the Group's operating activity, financial, legal and asset situation or reputation.

The EDF group has defined an Asset Security policy in the face of malicious acts and an Information System Security policy to prevent this risk and limit its impact in the event of an attack. These policies are supplemented by guidelines on the protection of personal data. However, the Group cannot rule out an attack on its information systems that would have consequences on the Group's operational activity, its finances, its legal position, in particular with regard to the integrity of personal data, or its reputation.

A charter for the use of IT resources is annexed to the Company's internal regulations. IS security training courses adapted to different profiles (users, project managers, IS security managers, etc.) are offered to employees. The Audit Committee of the Board of Directors receives reports on cyber security risk management. Several dozen security audits are carried out each year by external PASSI qualified IS security audit companies (IS security audit providers) by the ANSSI (French National Agency for Information Systems Security), both on IT infrastructures and on business information systems. In addition, the EDF group SOC (Security Operational Center) reports on IS security incidents on a monthly basis.

In 2020, the main actions deployed in the areas of cybersecurity, protection of intangible assets and, more generally, the company's resilience to the risks of damage to information systems are:

- continuing to notify cybersecurity objectives to the Directors of the Group's main entities;

- deploying within the entities a security reference framework based on the rules of the Agence nationale de la sécurité des systèmes d'information (French National Agency for Information Systems Security);
- including a cybersecurity clause in the general terms and conditions of purchase of service provider agreements;
- having the EDF CERT (Computer Emergency Response Team) carry out the incident response function in conjunction with all the Group's entities and external CERTs, in particular through its integration into the network of the main French CERTs managed by ANSSI;
- having the entities develop a reference framework identifying and classifying groups of information enabling EDF staff to know the level of sensitivity of the information they create and handle and to protect it accordingly, particularly in the context of the migration of collaborative tools to the Microsoft cloud;
- creating an Information Protection and Cybersecurity Awareness Raising Steering Committee tasked with strengthening action and synergies. All Group entities take part in this Committee along with the major French subsidiaries, Framatome, Enedis, EDF RE and Dalkia. The European subsidiaries are shareholders and will take part in 2021, in compliance with the rules of management independence that apply to regulated subsidiaries;
- the first joint action of this Committee is setting up mandatory training for Group managers in Cybersecurity and information protection (Cybersecurity Passport).

In addition, IS crisis drills are regularly carried out to test the various measures put in place.

4E – Operational continuity of supply chains and contractual relationships.

The Group is exposed to the operational continuity of supply chains and contractual relationships with its suppliers as well as to fluctuations in the price and availability of materials, equipments or services it purchases in the course of its business activities.

Criticality in view of the control actions undertaken: Intermediate.

The Group's needs may arise in markets with a reduced area or in markets subject to growing pressure, due in particular to the structure and evolution of the industrial offer or to increased competition from new uses that make the Group's industrial uses less attractive or more expensive. This pressure is attributable in particular to the growing needs of information systems and the needs of energy actors, especially those related to climate transition. These market pressures may increase the cost of supplying certain critical products or services and lead to a reduction in supply by some suppliers in response to a contraction in their margins. Fluctuations in the price and availability of certain raw materials or products that play a key role in setting the price of electricity and energy services may affect the Group's supply capacity and results.

The Group uses technologies, mainly in the fields of nuclear, hydraulic or renewable energy generation, electrical storage or mobility, that require materials or elements that may be highly sensitive in terms of access [(1)]. The scarcity or conditions of access to certain raw materials may be critical for the Group due to geological, geopolitical, industrial, regulatory or competitive limitations, particularly in a context of energy transition. Certain crisis situations, such as the Covid health crisis, may also accentuate or generate difficulties of access to certain products, materials or services required for the Group's activities and may make performing certain services particularly complex or delay their completion. The development of uses, particularly related to storage, the growth of renewable energies and the penetration of low-carbon electricity, could pose problems of access to certain materials: Lithium for batteries, ferromagnetic rare earths for wind power, Indium or Selenium for solar energy. These difficulties could limit the Group's ability to achieve its development objectives. In addition, control of the conditions under which raw or semi-finished materials are extracted, processed, packaged or made available for the Group's needs may be subject to provisions calling for greater control of regulatory requirements and a duty of vigilance.

Moreover, the Group currently depends on a limited number of industrial players with specific skills and the required experience. This situation reduces competition in markets where EDF is a buyer and exposes the Group to the default risk of one or more of these specialised suppliers or service providers. Restructuring observed at the level of major groups (GE, ABB, ENGIE, Rolls-Royce, Bilfinger, etc.), some of which are under pressure from activist minority funds, may also have an impact on the quality and operational continuity of contracts in progress, or the cost of services rendered and products delivered. But apart from the large groups, it is the small and medium-sized French companies that represent the essential part of the industrial fabric of suppliers. These companies have so far weathered the Covid crisis relatively well. Indeed, those companies that were the most affected suffered from their exposure to the aeronautics, oil and automotive sectors rather than the nuclear sector, as the nuclear sector continued to ensure sustained activity thanks to the major maintenance projects underway in France in particular. However, the trend of financial fragility observed over the last ten years or so continues, although bankruptcies, which are limited in number, generally end in a takeover and provide an opportunity for revitalisation. Regular monitoring of the situation of these suppliers is carried out through specific reviews.

There may also be difficulties in terms of relationships with the partners involved with EDF in completing these projects. Trade tensions between the United States and China could have an impact on the conduct of some of these projects given the technologies and partnerships implemented.

In this regard, in October 2018, the US Department of Energy ("US DoE") issued a decision on civil nuclear cooperation with China which deals in particular with the transfer of US goods and technology, or goods and technology of US origin, to CGN (which is a partner of EDF, in particular in New Nuclear projects in the UK), its subsidiaries and related entities. This decision concerns technologies relating to equipment within or directly attached to the vessel of the nuclear reactor, core power control equipment and equipment that contains or is in direct contact with the primary fluid. On 14 August 2019, the United States Department of Commerce ("US DoC") issued a ruling placing four CGN Group entities on the list of entities subject to restrictions ("Entity List") concerning any transfer of goods and technology, in particular US dual-use goods and technology, or dual-use goods and technology of US origin (or including a certain percentage of US content) subject to the jurisdiction of the US DoC (export administration regulations: covering all goods and technology, in particular dual-use commercial goods and technology, other than those subject to the jurisdiction of the US DoE and the Nuclear Regulatory Agency). As a result of these decisions, the transfer of goods and technology to the entities in question for the technical scope covering them under the decisions, must be specifically authorised in advance by the competent US courts, with the presumption that such authorisation will be refused.

In addition, the US Department of Defense published in June 2020 a list of entities, including CGN, presumed to belong to or be affiliated with the Chinese army. As a result of these measures, the People's Republic of China enacted its first integrated law on the control of exports of sensitive goods and technologies (December 2020), as well as a "blocking law" against decisions, particularly those of the United States, that are extraterritorial in scope (January 2021). In response, and in order to ensure its compliance with these laws and decisions, the EDF group (EDF SA, NNB, Framatome, etc.) has taken precautionary measures in connection with the organisation of its nuclear projects, particularly in the United Kingdom.

The Excell plan aims to meet these challenges: strengthening the sector's skills (welding plan and actions in connection with professional and educational structures), improving supplier selection and qualification processes, taking into account the "Ethics and human rights" and "Territorial development" CSR issues (see sections 3.3.2 and 3.4.2), as well as increasing the number of more partnership-based contractual terms and conditions. GIFEN [(2)] is also a key player as a relay for the Group's industrial policy.

The Group's performance is also based on the contracts signed with suppliers of equipment or services. Improved contractualisation and management of the contracts that have been entered into, in particular through the implementation of vigilance actions at each stage, is a major issue in terms of controlling operations, deadlines and associated costs.

(1) The topic of Uranium supply is not considered here. It is dealt with in Risk 5D "Control of the fuel cycle".

(2) The Groupement des Industriels Français de l'Énergie Nucléaire (French Nuclear Energy Industry Group), created in June 2018, aims to bring together all the actors of the French nuclear industry to ensure the attractiveness of the sector and maintain its skills.

The Contract Management function aims to improve the management of risks and create opportunities in the management of contracts. This function calls upon Contract Managers in the departments throughout the contractual process. It is an additional line of defence in the management of contracts, in relation to Group top managers and the departments. The Contract Management Department, attached to the Secretary General, is responsible for structuring this function, coordinating the Contract Management sector, determining the performance measurement reference system, professionalising the players and providing business knowledge and a digital Contract Management tool.

4F – Risk of blackout or supply/demand imbalance.

Repeated customer power supply interruptions, or a black out, or a widespread power grid incident, in a territory served by the Group could have consequences for the Group's activities, financial position and reputation, particularly if they were partly attributable to the Group.

Criticality in view of the control actions undertaken: Moderate.

The Group may be faced with repeated power outages or even a black-out, a widespread network incident of considerable scale, or be involved in it, even if the triggering incident occurred on a network not operated by EDF or was attributable to another player.

The causes of power outages can be diverse: local or regional imbalance between electricity generation and consumption, accidental power supply or transmission failure, cascade failures, interconnection problems, delays in investment and the necessary network conversions to meet the needs of energy and ecological transition, difficulty in coordinating players, particularly in a market with insufficient or evolving regulation. An external crisis, such as the Covid health crisis, can, through the disruptions it generates, constitute an aggravating risk factor.

The initial impact of such power failures could be repair costs incurred to re-establish power or restore the network. Power failures may also generate capital expenditures if it were decided, for example, to install additional generation or network capacity. This could also cause a decline in the Group's turnover. Finally, they could have a negative impact on the Group's financial position or reputation with its customers and all its stakeholders, particularly if the power outage were to be partly attributable to it.

4G – Industrial safety and impact on environmental assets, including biodiversity.

The Group operates facilities for which accidents could, in the event of a failure in industrial safety, have serious consequences on the human or natural environment, particularly in terms of biodiversity and environmental capital (soils and water).

Criticality in view of the control actions undertaken: Moderate.

The Group operates or has operated facilities which, as part of their day-to-day operations, can, may or may have been the cause of incidents, industrial accidents having environmental and health impacts. The Group's facilities may be located in industrial areas where other activities subject to similar risks exist, which means that the Group's own facilities may be impacted by accidents occurring at neighbouring facilities owned by other operators and not under the Group's control.

Biodiversity issues concern all the Group's facilities and projects, particularly in France where EDF is a landowner and a manager of natural resources of great importance. The risk management studies carried out on each industrial site integrate potential health or environmental impacts and avoidance measures in the event of accident situations. In this respect, feedback from the fire that occurred on 26 September 2019 at the Lubrizol plant in Rouen will be included in the analyses. This issue is all the more important as energy transition introduces new or reinforced requirements in relation to protection of biodiversity. The Group is committed to biodiversity through its corporate social responsibility concerns relating to the preservation of the planet's resources (see section 3.2.).

Measures taken for industrial safety and the control of these risks may not be fully effective, which could have consequences for people, property and immediate surroundings. The Group may be held liable.

In case of a major accident, insurance policies for civil liability and damages taken out by the Group could prove to be significantly inadequate, and the Group cannot guarantee that it will be able in the long run to maintain a level of cover at least equal to current cover levels.

Risks specific to nuclear facilities are further developed in section 2.2.5 "Specific risks related to nuclear activities". Risks specific to hydraulic facilities are set out in 4B above.

The impact of an industrial safety failure may have a negative impact on the Group's operational activity, its financial or legal position, on the environmental assets, or its reputation, and may affect the Group's ability to achieve Corporate Responsibility Objective with respect to biodiversity.

The Group owns 40 facilities classified as Seveso under the European Directive for the prevention and management of major industrial risks. These are essentially storage or warehousing facilities for oil, gas or chemicals. The regulatory requirements applicable to this type of facility are implemented at all relevant Group sites. In addition, the Group's French Seveso sites have all responded to requests from prefects following the fire that occurred in 2019 at the Lubrizol plant, a Seveso classified site in Rouen.

2.2.5 Specific risks related to nuclear activities

The EDF group is the world's leading nuclear operator in terms of the number of reactors in operation (71 reactors for which the EDF group is the nuclear operator, out of 444 power reactors in operation in the world on 14 January 2021) [(1)].

The Group has basic nuclear fuel cycle facilities and carries out activities in research, equipment manufacture and the supply of services to other nuclear operators, since the integration of the Framatome subsidiary, within the scope of the Group in 2018.

In addition, the Group holds minority stakes in nuclear power plants in operation in China, the United States and in Belgium, which it does not operate.

The Group is investing in new reactor projects in France, the United Kingdom and China and carries out its nuclear industrial activity in other countries, notably India and the United Arab Emirates, countries in which nuclear operators signed agreements with the Group.

The share of nuclear energy, as a low-carbon form of energy and a part of the Group's electricity mix, thus represents a significant industrial asset for the competitiveness and development of the Group.

Given the low impact of fossil carbon dioxide emissions from the nuclear industry over the entire industrial lifecycle, the performance and control of nuclear activities contribute directly to the achievement of Corporate Responsibility Objectives (see chapter 3). The control and performance of nuclear activities are at the heart of EDF's sustainable development policy.

The nuclear activities of EDF are associated with the following issues:

- as with any nuclear operator, the latter's obligations mean giving ongoing priority to nuclear safety, based on technical and organisational provisions in order to guard against a nuclear accident and, in the hypothetical event of an accident occurring, to limit the consequences of such an accident. These principles are reaffirmed in the revision of the Group's nuclear safety policy in 2021. The nuclear business is carried out under the control of nuclear safety authorities in countries where the Group exercises nuclear operator responsibility. Failure to take nuclear safety into account as the number one priority could have a significant, even vital impact on the Group;

(1) Source: www.iaea.org/pris

- the Group's nuclear activity is subject to detailed and demanding regulations with, particularly in France, a system in place that monitors and periodically re-examines basic nuclear facilities, which focuses, firstly on nuclear safety, protection of the environment and public health, but also on security considerations regarding malicious acts. These regulations may be significantly tightened by national or European authorities. Furthermore, stricter regulations or possible non-compliance with current or future regulations could result in the temporary or permanent shutdown of one or more of the Group's plants or financial penalties as stated in Article L. 596-4 of the French Environmental Code. Cases of non-compliance with regulations or non-compliance with commitments undertaken may also be used by third parties against EDF and brought before the courts. The increased number of requests emanating from the French Nuclear Safety Authority (NSA) and enhanced controls may increase EDF's compliance costs and risks;
- although the nuclear business can contribute effectively to the security of energy supply and to combating the greenhouse effect, it must also demonstrate its competitiveness and its acceptance over the different time scales in which it operates. Nuclear activity by its very nature requires substantial and long-term investments. The robustness and efficiency over time of maintenance and upgrading programmes for the operating fleet, new reactor projects, and the respect of very long-term commitments are inevitably subject to extreme vigilance, with industrial cycles that span a century or even beyond;
- the nuclear fuel cycle is part of this long-term industrial outlook. EDF has a specific responsibility to develop a long-term strategy with the various stakeholders;
- the nuclear business is an industrial activity that brings together a large number of industrial partners in France, Europe and throughout the world. In France, EDF was assigned the role of lead company in the nuclear sector by the public authorities, with the integration of the Framatome subsidiary, which involves specific risks associated with the exercise of this responsibility and the activities of Framatome.

In light of the fact that EDF is the world's largest nuclear operator, exploiting global feedback and making comparisons with best practices internationally [1] represents an ongoing challenge to ensure that the EDF group is well positioned to be able to sustainably manage the risks associated with being the world leader.

5A – Failure to comply with the objectives (i) in terms of operation and/or (ii) in terms of extending the operating life of nuclear power plants (France and United Kingdom).

The Group may not meet its nuclear power plants' operating objectives in terms of safety and availability. It may also not continue operating its reactors beyond the current planned expiry date, or even be authorised to operate them until that date in both France and the United Kingdom. In addition, the Group may not be able to control costs and deadlines for upgrading its operating fleet (Grand carénage refurbishment projects in France). This represents a major risk for the Group.

Criticality in view of the control actions undertaken: Strong.

Nuclear fleet in France

The health crisis could affect the achievement of operating targets and the success of maintenance projects, including the *Grand Carénage* projects. If the health crisis were to worsen, it could lead to further delays or additional costs, particularly due to public health requirements (social distancing, curfews, lockdowns, etc.).

The fleet of nuclear reactors that the Group currently operates in France is highly standardised (see section 1.4.1.1.1 "EDF's nuclear fleet in France"). This enables the Group, in particular, to achieve economies of scale, to apply improvements made to its newest reactors to all reactors and, in the event of a reactor malfunction, to anticipate the measures to be taken in other reactors. But this standardisation has a potential parallel risk of the dysfunction being common to several reactors or to a generation or series of reactors (see section 1.4.1.1.2 "Nuclear power generation in France").

The Group cannot guarantee that it will not be required to make significant or costly repairs or modifications to all or some of its plants. In addition, the occurrence of events that could have an impact on the operation of the fleet or on its output, which could lead to a temporary shutdown or closure of all or part of the fleet cannot be ruled out. For example, the deviation related to the stress relieving process for steam generator (SG) welds which was detected and reported to the Safety Authority in the summer of 2019 concerned the SGs installed on six reactors in the nuclear fleet operating in France and the Flamanville 3 EPR. However, this event did not ultimately lead to reactor unavailability (see Risk 4A – Framatome).

During the periodic reviews carried out during the ten-yearly inspections and following the Fukushima accident in Japan, the Group drew up a major work programme, called *Grand Carénage*, the principle of which was approved by the Board of Directors (see section 1.4.1.1.2). The potential risks of the latter include a possible delay in the appraisal of the authorisations required to start operations, in particular as regards the authorisations expected from the French Nuclear Safety Authority (ASN). Such uncertainties may also concern the manufacture and delivery on site of new equipment or work carried out on-site in a situation where a large number of industrial operations are being carried out at the same time. Any delays caused by the health crisis may also mean that the work will not be able to be completed within the stipulated timeframe.

The ASN decides on the measures taken by the operator and may give additional instructions for each reactor. Solutions are being studied to demonstrate the capacity of non-replaceable equipment such as the containment building and reactor vessels, to ensure their operation up to 60 years. These studies, which are based on data available in France but also internationally [2] make it possible to confirm the safety margins available for the operating periods under investigation but may also lead to the need to adopt additional protective measures, if necessary, to be taken on the existing fleet, which could have consequences on its performance.

In order to continue to benefit from low-carbon monitored generation and cash flow from its existing fleet, the Group has been aiming for several years to extend the operating life of its nuclear fleet in France beyond 40 years. The fourth ten-yearly inspection of the 900MWe reactor series (VD4-900), like the previous ones, includes, on the one hand, a verification of the compliance of the facilities with the current reference design and, on the other hand, a safety reassessment. This makes it possible to increase the level of safety by taking into account, on the one hand, international best practices and, on the other hand, the condition of the facilities, the experience acquired during operation and the evolution of the knowledge and rules applicable to similar facilities. As part of this process, the ASN could prescribe significant additional amendments.

In its decision of 23 February 2021 on the conditions for continued operation of EDF's 900MWe reactors beyond their fourth periodic review, the ASN found that the measures planned by EDF, supplemented by the responses to the requirements formulated by the ASN, will make it possible to achieve the objectives of the review and that these safety improvements open up the prospect of continued operation of the 900MWe reactors for a period of ten years beyond their fourth periodic review, subject to the implementation of additional measures. These new requirements lead to an increase in investments and an additional industrial load of around 25% compared to the already very ambitious initial programme, increasing the risk on the ability of industrialists to make the necessary investments within the stipulated deadlines. This additional cost is taken into account for the period from 2014 to 2025 in the cost increase for the *Grand Carénage* project as announced in the press release of 29 October 2020. Capital expenditure will remain high after 2025.

(1) Exploitation of standards and feedback from the International Atomic Energy Agency and the World Association of Nuclear Operators (WANO).

(2) In the US, four reactors have been licensed to operate for up to 80 years, while the licence application is still under examination for six other reactors: The Nuclear Regulatory Commission (NRC) staff has defined subsequent license renewal (SLR) to be the period of extended operation from 60 years to 80 years (www.nrc.gov/reactors/operating/licensing/renewal/subsequent-license-renewal.html).

In accordance with the French Environmental Code, the provisions proposed by EDF during reviews after the 35th year of operation will be submitted reactor by reactor to the ASN for authorisation, after a public enquiry. For Tricastin 1, the VD4 (pilot plant) started on the 1st of June 2019 and ended with re-coupling on 23 December 2019, after the ASN had given its authorisation to restart. The periodic review findings report (RCR) was transmitted in February 2020 and will be the subject of a public enquiry in 2021, after publication of the generic ASN opinion on the VD4. The ASN opinion on the Tricastin 1 periodic review report is expected to be issued in late 2021 or early 2022. It is likely to include site-specific requirements in addition to the requirements of the generic opinion, impacting industrial load and costs. As of 10 February 2021, the VD4 is in progress for the Bugey 2, Bugey 4 and Tricastin 2 nuclear units.

In 2016, the Board of Directors considered that all the technical, economic and governance conditions necessary to align the depreciation period of the French nuclear fleet with the Group's industrial strategy were met (see notes 1.3.4 "Management judgements and estimates" and 1.3.4.1 "Depreciation period of nuclear power plants in France" of the appendix to the consolidated financial statements at 31 December 2020). It therefore approved the extension in the consolidated financial statements of the depreciation period for 900MW PWR plants outside Fessenheim from 40 years to 50 years, without anticipating the decisions of the ASN on EDF provisions on a reactor-by-reactor basis after each 10-year inspection. It cannot be ruled out that the extension of the operating life of certain 900MW reactors may not be authorised, but an important step has been taken with the generic opinion issued by the ASN on 23 February 2021. With regard to the Fessenheim nuclear power plant, Reactor no. 1 was shut down on 22 February 2020 and Reactor no. 2 on 30 June 2020.

The continuing of operation of the other series of France's nuclear fleet (1,300MW and 1,450MW), which are more recent, remains an industrial objective for the Group.

The Group cannot guarantee that it will receive the expected operating lifespan extension from the competent authorities. Furthermore, such extensions could also be obtained under certain conditions, the financial impact of which, in particular in terms of investments, could affect the Group's strategy with respect to extending the operating life of its reactors or the Group's ability to pursue its global investment strategy. These events could have a significant negative impact on the Group's financial position.

Nuclear facilities in the United Kingdom

In the United Kingdom, the ongoing analysis of graphite ageing in the AGR (Advanced Gas Reactor) reactor may lead to prolonged unavailability or early shutdown of the reactors. The cracking of graphite subjected to irradiation must be carefully monitored, with inspections carried out regularly, and controlled by the Office for Nuclear Regulation ("ONR"), to ensure that there is sufficient knowledge of the core to justify continued operation. In August 2020 and November 2020 decisions were made to terminate the operation of the Hunterston B power plant no later than 7 January 2022 and the Hinkley Point B power plant no later than 15 July 2022. Operations may cease before these dates if a new safety case is not approved. For Hinkley Point B this safety case is required to restart the two reactors currently shut down for graphite inspection.

The current planned operating period for the reactors in EDF Energy's existing nuclear fleet ranges from 41 to 47 calendar years for advanced gas reactors (AGRs) and is 40 years for the Sizewell B pressurised water reactor (PWR). Since EDF Energy acquired them, the operating lifespan of the AGR power plants has been extended by 8 years on average and the objective is to increase the operating life of the PWR power plant by 20 years after the currently planned 40 years (see section 1.4.5.1.2.2 "Nuclear generation"). Nevertheless, given the nuclear safety rules applicable in the United Kingdom and AGR reactor technology in particular, the Group cannot guarantee that EDF Energy will obtain the necessary authorisations from the ONR when the time comes to operate its existing nuclear reactors until the currently planned (AGR) or potential (Sizewell B) end of operation date, or that such authorisations will not be obtained under conditions involving significant expenditure or investment by the Group.

In view of the risk of early shutdown due to difficulties in preparing the safety case owning to the graphite inspection at Hunterston B and Hinkley Point B, EDF Energy has set itself the target of having a safety case for the removal of fuel at these two plants as from May 2021. An accelerated fuel withdrawal strategy would be implemented in the event of any risk of an early shutdown of the other AGR plants. If this strategy were to be adopted, it may require that the value of the assets be re-examined.

Given the ageing of the British fleet and the many technical difficulties encountered, the future level of output of the AGR reactors currently in service is very uncertain.

Other nuclear facilities

For nuclear reactors where EDF is not in charge of operation but has financial interests (United States, Belgium, China), the Group is also financially exposed to some risks. The Group may need to contribute up to the amount of its share to costly repairs or modifications to be carried out on these units or to events that may have an impact on their operating lifespan, production or availability. As in France and the United Kingdom, the nuclear safety authorities in these countries may take decisions that require additional works or controls, in particular as regards exploiting feedback from international experience and anticipating potentially precursory events.

Other risks

Furthermore, despite the quality of operations and the changes made by the Group to its nuclear facilities, it cannot be ruled out that some of these facilities will be subject to special operating conditions to reinforce the operating safety margins at the initiative of the nuclear operator responsible for nuclear safety or at the request of the Nuclear Safety Agency.

Finally, a potential serious nuclear accident not involving the Group but with widespread consequences worldwide could lead the Safety Authorities to require new reactor upgrades applicable to the Group's reactors, and to those in which the Group has a stake.

5B – Control of radioactive waste treatment and decommissioning of nuclear facilities, and ability to meet related commitments.

The provisions set aside by the Group for the decommissioning of nuclear facilities and for the treatment and ultimate disposal of radioactive waste, including long-lived waste from spent fuel treatment and decommissioning, may prove to be insufficient. In particular, decommissioning existing nuclear facilities may present currently unforeseen difficulties or be much costlier than anticipated. In addition, these operations must address the CSR challenge of waste management and the circular economy.

The amount of dedicated assets in France allocated by the Group to cover the costs of its long-term nuclear business commitments (radioactive waste and decommissioning) might need to be revised upwards or require additional expenditures.

Criticality in view of the control actions undertaken: Intermediate.

Decommissioning

The decommissioning operations underway in France (see section 1.4.1.1.2.3 "Decommissioning of nuclear power plants") concern plants that were built and operated before the current nuclear fleet, including the Superphenix plant ("first generation" plants). These operations cover four different reactor technologies: heavy water reactor (Brennilis), sodium-cooled fast reactor (Superphenix at Creys-Malville), graphite-moderated and gas-cooled reactor (NUGG reactors at Chinon, Saint Laurent and Bugey) and the pressurised water reactor ("PWR") at Chooz. Each of them is a first for EDF, and apart from the PWR, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. The decommissioning of the PWR at Chooz A does benefit from some feedback (essentially American and of a limited nature) but it has the innovative specific feature of being located in a cave, which also makes it an unusual operation for which experience is not immediately transferable and which includes specific risks.

The Chooz A PWR decommissioning operations are continuing with the cutting and removal of the vessel internals according to schedule, after the reactor pool was filled with water in 2018 and the vessel was opened in March 2017.

The feedback from the PWR at Chooz will enable consolidation, as far as possible, of the studies and estimates on the future costs of decommissioning the nuclear fleet currently in operation ("second generation" power plants). The first reactor of the Fessenheim power plant was definitively shut down on 22 February 2020. The second was shut down on 30 June 2020. These two reactors will be the first of the nuclear fleet currently in operation to benefit from this feedback for their decommissioning. Nevertheless, neither EDF, nor any other operator, has yet undertaken a decommissioning programme on a scale comparable to that of the Group's current PWR fleet and the estimates therefore involve risks that are associated in particular with this scale effect.

The timing and cost of the work are also dependent on administrative authorisations and the availability, at the necessary time, of radioactive waste storage centres or other facilities necessary for the conditioning, treatment or storage of waste containers.

In addition to these technical and industrial sensitivity factors, the amount of provisions currently set aside may change in the coming years. Indeed, the assessment of the need for these provisions is sensitive to the assumptions used for costs, planning, inflation rates and long-term discount rates, and to any change in the regulations, in particular those relating to the scope of expenses to be covered. The amount of these provisions, in accordance with the French Environmental Code, is subject to control by the administrative authority, which verifies in particular the adequacy of the provisioned expenses and imposes a cap on the discount rate for the provisions.

Given these sensitivity factors, changes in certain parameters may require significant adjustments of the provisions booked and, therefore, the Group cannot guarantee that the provisions booked will equal the costs actually incurred at the relevant time, which would have an adverse impact on the Group's financial position (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020). The Group regularly conducts an update of the key assumptions underlying the provisions (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020).

With regard to the provision for decommissioning of nuclear power generation facilities in France, the amount of expenses under economic conditions at the end of 2020 is estimated at €27,093 million, the corresponding provision is €17,489 million. As for the last core provision, costs based on year-end economic conditions are estimated at €4,258 million and provision at present value amounts are valued €2,711 million, as the discounting effect is very significant due to distant waste storage maturities. Note 15.1.1.5 "Analyses of sensitivity to macro-economic assumptions" of the appendix to the consolidated financial statements for the fiscal year ended on 31 December 2020 indicates the analyses of sensitivity of provisions and Group's results to a discount rate change, for the different types of provisions.

The provisions of Framatome and Cyclife France (formerly SOCODEI) relating to basic nuclear facilities in France amounted to €78 million and €62 million respectively (see note 17.1 "Other provisions for decommissioning" of the appendix to the consolidated financial statements for the year ended 31 December 2020).

In the United Kingdom, under the agreements concluded in connection with the restructuring of British Energy, the costs of decommissioning EDF Energy Nuclear Generation Group Ltd.'s existing nuclear power plants will be paid by the Nuclear Liabilities Fund (NLF). If the assets of this Fund prove insufficient, these costs will be borne by the UK Government (see section 1.4.5.1.2.2 "Nuclear Generation"). In 2019, EDF Energy and the UK Government (BEIS) began discussions with a view to clarifying the conditions for implementing the above-mentioned agreements, in particular as regards determining the decommissioning costs to be recovered by EDF Energy from the Nuclear Liabilities Fund and the conditions under which the UK authorities may exercise their option to acquire the nuclear power plants at the end of the defueling phase. These discussions led to an agreement in principle in 2019 and are continuing with a view to reaching comprehensive and binding agreements.

In any event, the agreements in force provide that the expenses related to the unloading and evacuation of the fuel are covered by the NLF and consequently justified by EDF Energy and approved by the French government; failing this, they would remain the responsibility of EDF Energy.

For nuclear power plants which EDF does not operate, but has financial interests in (China, United States, Belgium), the Group is exposed financially in proportion to its contribution to future decommissioning costs.

Failure to control the costs, the time-frame for completion and the associated provisions with respect to the decommissioning of nuclear facilities for which the Group is liable would have a negative impact on the Group's financial position and reputation.

Waste Management

As a nuclear operator or producer of radioactive waste, within the meaning of the legislation applicable to waste, the Group could be held liable, in particular in the event of an accident involving damage to third parties or to the environment in connection with spent fuel or waste. The Group may be held liable even if these products are handled, transported, held, stored or warehoused by parties other than the Group, in particular, in France, the Orano Group and the French National Agency for Radioactive Waste Management (ANDRA), particularly in the event of any failure by any of the latter.

In France, EDF is liable for all radioactive waste produced during:

- the operation of the nuclear facilities operated by the Group;
- processing operations for spent fuel from reactors operated by EDF;
- decommissioning operations at the nuclear facilities operated by the Group. (See section 1.4.1.1.2.3 "The challenges specific to the nuclear activity" – Storing conditioned ultimate waste).

The long-term management of radioactive waste has been the subject of various studies under programme laws no. 91-1381 of 30 December 1991 on research on radioactive waste management and no. 2006-739 of 28 June 2006 on the sustainable management of radioactive materials and waste. All of the Group's Long-Lived High-Level and Intermediate-Level waste may not constitute "ultimate radioactive waste" within the meaning of Article L. 542-1-1 of the French Environmental Code. In this case, it may not be possible to store this waste directly in a deep geological repository, especially since the Nuclear Order of 10 February 2016 issued pursuant to Act no. 2015-992 relating to the energy transition for green growth allows for the reclassification of radioactive materials as radioactive waste and vice-versa by the administrative authority. Moreover, the Group has no control over the time taken by the public authorities to issue permits for such ultimate storage, nor over the technical guidelines that are set forth. This is likely to create uncertainties regarding the fate of the waste, the liability and the resulting costs for EDF.

EDF has allocated provisions for the long-term management of waste, assessed on the assumption of geological storage, which is the international solution of reference for the ultimate storage of long-lived high-level radioactive waste and on the basis of a reasonable version of the work carried out in 2006 by a working group comprising ANDRA, the public authorities and radioactive waste producers (see note 15.1 of the appendix to the consolidated financial statements for the year ended 31 December 2020). Following new calculations of the costs of deep storage under the supervision of the DGEC in conjunction with EDF, the Minister of Ecology, Sustainable Development and Energy, in an order of 15 January 2016, set the new reference cost at €25 billion under the economic conditions of 31 December 2011. This cost was taken into account in the Group's financial statements at the end of 2015 (see note 15.1 of the appendix to the consolidated financial statements for the year ended 31 December 2020). The current estimate is based on the preliminary design assumptions and will be regularly revised based on the progress of the project, as stated in the Ministerial order. Opinion no. 2018-AV-0300 from the French Nuclear Safety Authority dated 11 January 2018 relative to the safety options file presented by Andra for the Cigeo project to store radioactive waste in a deep geological layer specifies that the project has achieved satisfactory overall technological maturity at the stage of the safety options file. The reservations that remain and the supplementary investigation being carried out for Andra to obtain approval for the construction of the geological storage area starting in 2022 could lead to a revision of the provisions for long-term radioactive waste management.

Act no. 2006-739 dated 28 June 2006 provided for a dedicated storage centre for Low-Level Long-Lived waste (LLW-LL), such as graphite. ANDRA submitted a progress report in July 2015 under the national plan for the management of radioactive materials and radioactive waste (PNGMDR). This report assesses several storage concepts and allows for the possibility of storage of graphite waste on the Soulaines site. The overall industrial scheme for the management of all LLW-LL is being defined within the framework of the PNGMDR (see section 1.4.1.1.2.3 "The challenges specific to the nuclear activity"). Provisions may have to be adjusted accordingly.

In the United Kingdom, when British Energy was restructured, agreements were entered into with the authorities concerning the management of certain radioactive waste from existing nuclear power plants (see section 1.4.5.1.2.2 "Nuclear generation"). Under the terms of these agreements, the liability and certain costs associated with the management of certain radioactive waste are transferred to the British government. However, EDF Energy Nuclear Generation Ltd. remains financially, technically and legally liable for the management, storage and processing of waste that does not come within the scope of the aforementioned agreements.

For nuclear power plants which EDF does not operate, but in which it has financial interests (United States, Belgium, China), the Group is exposed financially in proportion to its shareholding to contributing to future expenditures related to the management of spent fuel and waste.

These technical, industrial or administrative uncertainties and contingencies which might affect decommissioning projects and waste management could have an impact on the amount of provisions currently set aside. This amount could also change in the coming years depending on the assumptions used in terms of costs, inflation rate, long-term discount rate and disbursement schedules, as well as any changes in regulations. All of this may have a material adverse impact on the Group's financial position (see note 15.1 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020).The amount of these provisions, in accordance with the French Environmental Code, is subject in France to control by the administrative authority, composed jointly of the Ministers in charge of the Economy and Energy, with said control verifying in particular the adequacy of the amounts provided for and imposing a ceiling on the discount rate of the provisions.

Note 15.1.1.5 "Inflation rate, discount rate and analyses of sensitivity" of note 15.1 "Nuclear provisions in France" of the appendix to the consolidated financial statements as of 31 December 2020 shows the connection between "costs based on year-end economic conditions", which represent estimated amounts as at 31 December 2020, and provisions made at present value. Concerning the long-term management of waste and the recovery and packaging of waste, the expenses at year-end economic conditions are evaluated at €35,581 million and the corresponding provision is €13,300 million, as the discounting effect is very significant due to distant waste storage maturities. Note 15.1.1.5 "Inflation rate, discount rate and analyses of sensitivity" indicates the analyses of sensitivity of provisions and Group's results to a discount rate change, for the different types of provisions.

Failure to control the costs and time-frames for completion with respect to the solutions for the treatment and ultimate storage of waste for which the Group is liable would have a negative impact on the Group's financial position and reputation.

Dedicated asset management

In France, the market value of EDF's portfolio of dedicated assets to cover the costs of long-term nuclear commitments (radioactive waste and decommissioning), amounted to €33.8 billion as of 31 December 2020, compared to €31.6 billion as of 31 December 2019 (see section 1.4.1.1.2.3 "The challenges specific to the nuclear activity" and note 15.1.2.4 of the appendix to the consolidated financial statements for the year ended 31 December 2020).

In the event of a significant change in the provisions determining the reference base of the dedicated assets, it might prove necessary to make additional allocations to adjust the value of these assets, which could have a material adverse impact on EDF's financial position. Moreover, stricter regulations at the national level (in particular those that might impact the base for determining the dedicated assets to be constituted by EDF [(1)]) or European level may lead to more stringent requirements regarding the constitution of dedicated assets and have a significant impact on EDF's financial position.

Lastly, although these assets are constituted and managed in accordance with strict prudential rules, the Group cannot guarantee that price fluctuations in the financial markets or changes in valuation will not have a material adverse impact on the value of these assets (see section 5.1.6.1.6 "Management of financial risk on EDF's dedicated asset portfolio" for a sensitivity analysis), which could require EDF to allocate additional amounts to restore the value of these assets. Such events could have a material adverse effect on the Group's financial position.

In the United Kingdom, the funds for nuclear liabilities are managed by a body independent of EDF set up by the British government (*Nuclear Liabilities Fund* – NLF) for the existing nuclear fleet. For HPC-related liabilities, the funds will be managed by FundCo, a body (Trust) independent of HPC's shareholders (EDF Energy and CGN) and the UK government. Operators therefore have no assets to manage for this purpose (see section 1.4.5.1.2.2 "Nuclear generation").

The unavailability or insufficient amount of the dedicated assets to hedge the expenditure schedules of the Group's long-term commitments could have a negative impact on the Group's financial position and reputation.

5C – Nuclear safety violations during operation resulting from nuclear civil liability.

In addition to the control of industrial performance, and given the place of nuclear generation within the EDF group and with nuclear safety as the number one priority, our responsibility as a nuclear operator determines the Group's overall performance. As a result of its nuclear activities, the Group is exposed to nuclear civil liability risks.

Criticality in view of the control actions undertaken: Intermediate.

The primary responsibility for nuclear safety lies with the nuclear operator throughout the operating cycle of nuclear reactors. This principle along with the principle of control are reaffirmed in the EDF group's nuclear safety policy. Liability as a nuclear operator falls under the "nuclear safety, health and security" aspect of the Group's CSR policy (see section 3.3.1). The Chairman and CEO delegate this liability to the Group Executive Director for the Nuclear and Thermal Fleet Department and the Group Executive Director for the New Nuclear Engineering and Projects Department, who then sub-delegate it to the Directors of the divisions involved, who in turn sub-delegate it to unit managers.

The top priority is nuclear safety, as defined in the Group's Nuclear Safety Policy, and this is a factor in the industrial performance of the nuclear business as a whole. Nuclear safety takes into account the design by the nuclear operator and the operation by the designer. Failure to control operating safety could have major or even vital consequences on the value of the Group's industrial assets, its financial position and its development outlook or even on the continuation of its industrial activity.

Any serious event related to the Group's nuclear activities, with a potential or proven impact on the population or on a territory, could lead to a significant increase in the operating constraints of the Group's industrial sites, or even the partial or total interruption of the Group's nuclear activities. Such an event could have a significant negative impact on the Group's activities, financial position, strategy and reputation.

The nuclear civil liability scheme that applies to nuclear facility operators of States parties to the Paris Convention, and the insurance applicable thereto, are described in section 2.1.2.6 "Insurance". This scheme is based on the principle of the operator's strict liability. Accordingly, if an event occurs that causes nuclear damage, the Group would be automatically liable up to a monetary maximum set by the law applicable in the country, regardless of the source of the event that caused the damage and any safety measures that may have been taken.

(1) The French Cour des Comptes'' report to the Senate's Finance Committee on the decommissioning and dismantling of nuclear power plants, published on 4 March 2020, recommends that the costs of all decommissioning preparation operations, post-operational expenses and the cost of taxes, levies and insurance premiums directly attributable to decommissioning sites should gradually be included in the long-term expense categories.

The Group cannot guarantee that in countries where it operates nuclear facilities, the maximum liability set by law will not be increased or cancelled. For example, the protocols amending the Paris Convention and the Brussels Convention, not yet in force, provide for these maximum amounts to be increased and a substantial expansion of the damage to be covered. The operator's liability in France amounts to €700 million in the event of a nuclear accident in a facility and €80 million in the event of a nuclear accident during transport. The entry into force of the other changes laid out in these protocols is likely to increase yet again the cost of insurance and the Group cannot guarantee that insurance covering this liability will always be available or that it will always be able to maintain such insurance. Insurance coverage for the Group's nuclear operator's civil liability and for the transport of nuclear substances is described in section 2.1.2.6 "Insurance".

Property damage to EDF's nuclear facilities is covered by insurance programmes (see section 2.1.2.6 "Insurance"). Despite this cover, any event that may cause significant damage to a nuclear facility of the Group could have an adverse impact on the Group's business and financial position.

Lastly, the Group cannot guarantee that the insurers that cover both its liability as a nuclear plant operator and property damage to its facilities will always have available capacity or that the costs of cover will not significantly increase, particularly in light of the impacts on the insurance market of events such as the nuclear accident in Japan that occurred in March 2011.

In view of these risks, and in application of Group policy, each Group company operating nuclear facilities acts within the framework of legal and regulatory requirements specific to the country in which it operates and is obliged to comply with them. Each one ensures the nuclear safety of its facilities and constantly improves the level, based on its methods, skills and values. The Group develops common principles aiming to obtain the best level of prevention of incidents and protection of workers, the public and the environment. These principles apply to all stages of the activity, both for new projects and for the existing fleets. The Group closely involves its industrial partners with the achievement of these objectives.

Each company is responsible for the proper conduct of its nuclear activities and sets the appropriate delegations at each decision and action level. The Group guarantees the allocation of the necessary resources for nuclear safety.

An internal entity in charge of an independent safety evaluation is put in place at the level of each site, each company and of the Group. Each one reports to the manager concerned, independently of other managerial functions; furthermore, each one has the duty to alert the superior hierarchical level if the reaction of the level directly involved is not what is expected.

The Group's nuclear operating companies regularly receive international evaluation teams (WANO Peer Review [1] and OSART from the AIEA [2]).

Clear and honest communication on the events and their possible impacts are promoted within the Group. This high-quality dialogue is sought and maintained with the salaried personnel and its representatives, subcontractors, the supervisory authorities (Nuclear Safety Authority in France, Office for Nuclear Regulation in the United Kingdom), local communities and all other stakeholders in nuclear safety.

The Nuclear Safety Council, which the Chairman and CEO of EDF chairs, meets several times a year and periodically reviews the annual assessment of nuclear safety for the EDF group. A General Inspector for nuclear safety and radiation protection (IGSNR) is appointed by the Chairman and CEO to whom he/she reports. He/she carries out inspection missions on all of the nuclear activities of the EDF group. Each year, it gives an opinion on safety within EDF. Its report is presented and debated in the Nuclear Safety Council. It is then made public (see section 1.4.1.1.4.3).

5D – Control of the fuel cycle.

In addition to the control of nuclear safety (risk 5C), the operation of existing nuclear facilities (risk 5A) and new nuclear projects (risk 4A), the Group is exposed, in the context of nuclear activities, to the control of the nuclear fuel cycle.

Criticality in view of the control actions undertaken: Intermediate.

The Group's operating costs include nuclear fuel purchases.

EDF is supplied with uranium, conversion and enrichment services, fuel assembly supplies and spent fuel reprocessing operations for its nuclear fleet in France and the United Kingdom.

Prices and volumes are subject to fluctuations that depend on factors beyond the Group's control, including political and economic factors (in particular, profitability outlook for mining investments, supply/demand imbalance or tension on the supply side, associated, for example, with the occurrence of an operating incident in a uranium mine or cycle plant, a delay in the commissioning of a new mine or an event leading to institutional instability in a producing country, or restrictions/sanctions/embargos).

The storage and transport of new or spent nuclear fuel is an industrial activity that requires specific safety and security measures. These requirements could become more stringent, generating additional difficulties and costs for the Group.

In the event of the collapse of this industrial logistics system, the Group could reduce or even interrupt all or part of the electricity generation at the affected sites, either due to the non-delivery of new assemblies or to the saturation of intermediate storage facilities, which could have a negative impact on the Group's financial position (see section 1.4.1.1.2.3 "The challenges specific to the nuclear activity").

Despite the project to build a large-capacity spent fuel storage pool (see section 1.4.1.1.2.3 "The challenges specific to the nuclear activity"), the risk of the impossibility, in the long term, of implementing multi-recycling in its 3rd generation pressurised water reactors or recycling in fourth generation reactors known as "GEN IV" (abandonment of the ASTRID fast neutron reactor project), could call into question the fuel cycle, with consequences both in terms of operation and in financial terms.

In France, EDF has booked provisions for spent nuclear fuel management operations (transport, processing, conditioning for recycling) (see note 15 of the appendix to the consolidated financial statements for the fiscal year ended 31 December 2020) based on the price and volume conditions of the master agreement signed with Orano in December 2008 and broken down in the successive implementation agreements. The implementation agreement for the period from 2016-2023 was signed in February 2016 (see section 1.4.1.1.2.3 "The challenges specific to the nuclear activity"). The amount of provisions currently booked to cover the period not covered by the current agreement should be reassessed if the terms under which this agreement is renewed prove more onerous than those currently applicable.

Note 15.1.1.5 "Inflation rate, discount rate and analyses of sensitivity" and note 15.1 "Nuclear provisions in France" of the appendix to the consolidated financial statements as of 31 December 2020 show the connection between "costs based on year-end economic conditions", which represent estimated amounts as at 31 December 2020, and "provisions made at present value". As regards spent fuel management, pursuant to law of 28 June 2006, the costs based on year-end economic conditions are estimated at €18,998 million and the corresponding provision is €10,246 million.

However, the Group cannot guarantee that its contracts, in France and abroad, will completely protect it from sudden or significant price increases. The Group cannot guarantee that when these long-term contracts expire, it will be able to renew them, in particular at an equivalent price. This could have an adverse impact on the Group's financial position.

(1) WANO: World Association of Nuclear Operators.

(2) OSART: Operational Safety Analysis Review Team, International Atomic Energy Agency (IAEA).

The EDF's *raison d'être* is in line with the values of progress and sharing that have inspired EDF's actions since its creation, as well as with today's major issue of addressing climate change and preserving the planet. The key issues surrounding its *raison d'être* have been formalised in 16 CSR commitments adopted by all the Group's business lines and subsidiaries, focusing on major environmental, social and societal issues.

51 gCO_2/kWh	44%	28.7%	23.4%
GROUP CARBON INTENSITY [1]	ACHIEVEMENT RATE IN "ACT4NATURE INTERNATIONAL" [2]	OF FEMALE MEMBERS OF THE GROUP MANAGEMENT COMMITTEES [3]	OF PROCUREMENT FROM FRENCH SMES

(1) See section 3.1.1.1.3.

(2) Group biodiversity commitments (see section 3.2.1).

(3) Management Committees.

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Issues and commitments

In line with its *raison d'être*, strategy, business model and related risk factors [1], chapter 3 details the EDF group's non-financial performance issues, commitments, policies, actions and results.

16 high-priority CSR [2] issues

The EDF group's high-priority CSR issues guide its actions in terms of ESG [3] performance. They are seen as key non-financial issues, *i.e.* ones that involve risks and/or opportunities for the Group and its stakeholders. EDF has used a dual materiality analysis to map them over the last six years. This included identification, selection and ranking of the main non-financial issues, by combining the points of view of both external stakeholders (customers, investors, non-financial rating agencies, public authorities, etc.), and the Group itself [4].

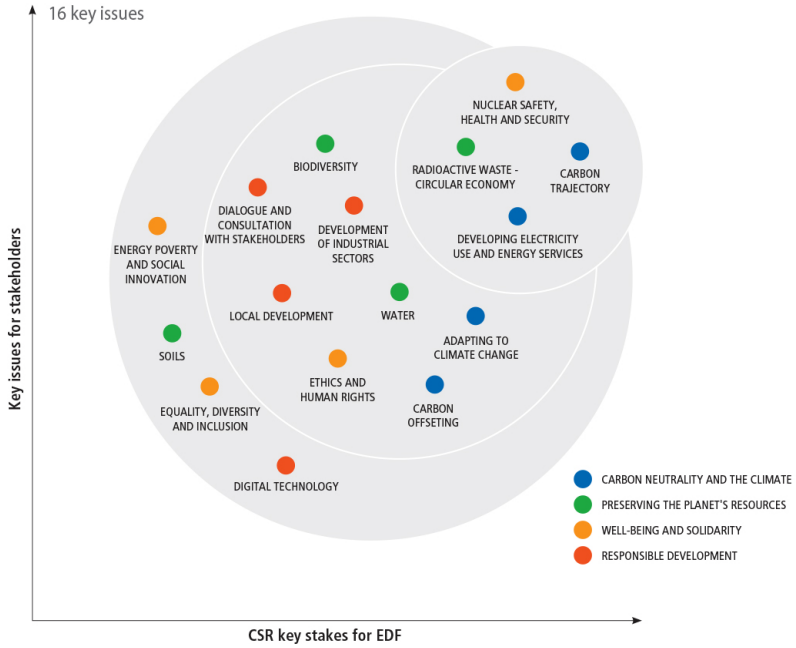
Against a changing backdrop, the initial dual materiality analysis carried out in 2014 was updated in 2017 and published in 2018. An official materiality matrix was drawn up, which is not designed to list and rank all the non-financial issues, but simply the most significant, or most "material" ones. The Group matrix was prepared with the support of a specialist firm and underpinned by international standards based on documentary studies, interviews and workshops conducted with about one hundred people forming a representative cross-section of the Group's stakeholders [5]. The project was divided into three phases: identification and evaluation of issues, prioritisation of issues and validation of results. External stakeholders included internationally-recognised qualified individuals as well as representatives of the Group's main stakeholders (authorities, administrations, shareholders, banks, customers, partners, subcontractors, suppliers, NGOs, etc.). Internally, members of the Executive Committee participated in the development process, as did managers from the Group's main departments and subsidiaries. The conclusions were approved by the Group Senior Executive Vice-President, Innovation, Corporate Responsibility & Strategy. In 2019, the panel of EDF external stakeholders, the Sustainable Development Council [6], met to examine the Group's materiality analysis and, based on current best practice, recommended reducing the number of issues from 35 to 18.

On 7 May 2020, the EDF group established its *raison d'être*, which was adopted by 99.99% of the General Meeting and added to its articles of association: "to build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development". More than 4,000 employees [7] contributed to developing this *raison d'être* and, in accordance with the EDF Sustainable Development Council [8], examined how to officially establish the Group's high-priority CSR issues, particularly based on the Group's non-financial risks and risk mapping, reducing the list from 18 to 16 [9].

These 16 high-priority CSR issues have been ranked and categorised, in line with the EDF's *raison d'être*, into four key issues:

- carbon neutrality and the climate;
- preserving the planet's resources;
- well-being and solidarity;
- responsible growth.

These high-priority CSR issues are officially mapped in the EDF group materiality matrix:



(1) For details of the EDF group's *raison d'être*: see the introduction to the URD; for details of the EDF group's strategy, see section 1.3 "Group strategy and goals"; for details of the EDF group's business model: see section 1.1; for details of the EDF group's risk factors: see chapter 2 "Risk factors and management".

(2) Corporate Social Responsibility.

(3) Measuring a business's ESG performance consists of assessing the extent to which Environmental, Social & Governance (ESG) impacts are taken into account in its strategy and management. This process is based on environmental, social and governance criteria that structure the business's non-financial performance analysis.

(4) Hence the term "dual materiality". The growing importance placed on this analysis is confirmed by the results of the 2020 Europe-wide consultation of 588 respondents as part of the process to revise the European Non-Financial Reporting Directive (NFRD).

(5) For a detailed description of the methodological aspects of the materiality matrix, please refer to section 3.7.2.1 "Details on the issues arising from the materiality matrix of the EDF group".

(6) See section 3.5.1.2 "Stakeholder panels".

(7) *Via* "*Parlons Énergie*" (i.e. Let's talk about energy), see section 3.5.1.1 "Listening and understanding issues".

(8) See section 3.5.1.2 "Stakeholder panels".

(9) See section 3.7.2.1 "Details on the issues arising from the materiality matrix of the EDF group".

16 CSR commitments

For each of the 16 high-priority CSR issues, the Group drew up a corresponding CSR commitment in the form of operational policies and actions designed, from an environmental, social and societal point of view, to minimise the negative impacts and maximise the positive impacts of each of these high-priority CSR issues.

The following mapping lists these 16 CSR commitments and states, for each of them, the section in which the corresponding non-financial risk specified in the Group major risk mapping [(1)] is described, its contribution to the UN Sustainable Development Goals, and related performance measurements.

ISSUES FROM THE *RAISON D'ÊTRE*	CSR COMMITMENTS		NON-FINANCIAL RISKS	CONTRIBUTION TO THE UN SD GOALS	KEY PERFORMANCE INDICATORS	SCOPE	UNIT	GOAL	2018	2019	2020
CARBON NEUTRALITY AND THE CLIMATE	AMBITIOUS CARBON TRAJECTORY	§ 3.1.1	3B	7, 13	Direct greenhouse gas emissions (scope 1) ✓	Group	$MtCO_2e$	25 by 2030	36	33	**28**
					Carbon intensity: specific CO_2 emissions due to electrical generation ✓	Group	gCO_2/kWh	35 by 2030	57	55	**51**
					Installed net renewable electricity generating capacities	Group	GW	60 by 2030	33	32	**33**
	CARBON OFFSET SOLUTIONS	§ 3.1.1.5		7, 13	Qualitative evaluation	Group					
	ADAPTING TO CLIMATE CHANGE	§ 3.1.2	3B	7, 13	Qualitative evaluation	Group					
	DEVELOPING ELECTRICITY USE AND ENERGY SERVICES	§ 3.1.4	3A	7, 8, 11	Number of smart meters installed	Group	Million	41 by 2021	18	26	**32**
					Electric vehicles rate in the fleet of light vehicles	Group	%	100 by 2030	6.1	8.6	**12.2**
PRESERVING THE PLANET'S RESOURCES	BIODIVERSITY	§ 3.2.1	4G	14, 15	Achievement rate of commitments under the "Act4nature international" initiative	Group	%	100 by 2022	-	-	**44**
	RESPONSIBLE LAND MANAGEMENT	§ 3.2.2	4A - 4G	15	Qualitative evaluation	Group					
	INTEGRATED AND SUSTAINABLE WATER MANAGEMENT	§ 3.2.3	4G - 3B	6, 9, 14	Water intensity: water consumed / electricity generated by fleet ✓	Group	l/kWh	below 0.95l/kWh on average over the past five years	0.86	0.87	**0.87**
	WASTE AND CIRCULAR ECONOMY	§ 3.2.4	5B	9, 15	France: volume of long-lived high and intermediate level solid radioactive waste	Group	m^3	-	315	304	**283**
					UK: volume of low level radioactive solid waste generated	Group	m^3	-	474	444	**352**
WELL-BEING AND SOLIDARITY	PROTECTING THE HEALTH AND SAFETY OF ALL	§ 3.3.1	5C - 4B - 4C	3, 12	Nuclear safety: Number of significant level-2 events on the INES scale	Group	Nb	-	1	3	**1**
					Global LTIR (employees and providers)	Group	Ind	< 1.8 by 2020	-	2.4	**1.9**
					Number of fatal accidents connected to business-specific risks (employees and providers)	Group	Nb	0	1	7	**7**
	ETHICS, COMPLIANCE AND HUMAN RIGHTS	§ 3.3.2	1E - 4E - 4A	4	Proportion of executives who have completed the anti-corruption training programme	Group	%	100 by 2021	57	61.8	**62.5**
	EQUALITY, DIVERSITY AND INCLUSION	§ 3.3.3	3C	1, 5	Gender balance index: percentage of women in the Management Committees of the Group's entities	Group	%	28 by 2023	26.3	27.3	**28.7**
					Percentage of employees who have taken part in a skills development initiative	Group	%	75	83	80	**71**
					Rate of employees covered by a collective bargaining agreement	Group	%	> 87	-	-	**87.2**
	ENERGY POVERTY AND SOCIAL INNOVATION	§ 3.3.4	1G	1, 7	Number of energy support	EDF	Nb	-	1,302,590	894,260	**905,017**
RESPONSIBLE DEVELOPMENT	DIALOGUE AND CONSULTATION WITH STAKEHOLDERS	§ 3.4.1	4A	16	Proportion of projects on which there is consultation in accordance with the Equator Principles	Group	%	100 by 2030	82	89.7	**84**
	RESPONSIBLE DEVELOPMENT OF LOCAL AREAS	§ 3.4.2	4E - 4A	8, 9, 10, 11, 17	Annual rate of procurement from SMEs in France	EDF and Enedis	%	22-26	23.7	22.5	**23.4**
	DEVELOPMENT OF INDUSTRIAL SECTORS	§ 3.4.3	4A	4	Qualitative evaluation	Group					
	RESPONSIBLE DIGITAL DEVELOPMENT	§ 3.4.4	4D	12	Number of visits on digital consumption monitoring platforms	EDF (excluding overseas department and Corsica)	Million	-	28	47	**73**

* based on the mapping of the Group's major risks, see section 2.2 "Risks to which the Group is exposed".

✓ 2020 indicator subject to reasonable assurance check by KPMG SA.

(1) This is the non-financial set of risks specified in the Group major risks mapping. Details are provided in section 3.7.2.1 "Details on the issues arising from the materiality matrix of the EDF group".

Details of the EDF group's commitments, policies and actions are provided later in this chapter.

EDF, a responsible business during the sanitary crisis [1]

The EDF group deployed specific measures covering its employees, customers and suppliers, and provided essential support for local authorities.

In France, for its residential clients, it suspended any reductions or outages of electricity and gas supplies as well as late-payment penalties up until 1 September 2020 [2]. For customers facing payment issues, EDF relaxed its payment terms, conditions and periods, covering a broader scope and longer duration than the measures put in place by public authorities. These exceptional measures were extended without change for the second lockdown and up until 15 January 2021.

For its business customers in France, the Group took all necessary measures to enable its customers eligible for the state financial support in response to the sanitary crisis to defer payment of their bills, in accordance with the orders and decrees adopted by the French government. This meant that any small businesses affected were able to apply for deferral of the payment of their outstanding bills until the end of the sanitary state of emergency, before paying in instalments over a 6-month period.

The Group also granted its customers payment facilities in Italy, Belgium and the United Kingdom.

In France, EDF maintained ties with all its customers during the first lockdown through the hard work of 3,000 remote advisors, who provided the necessary quality of service and support. All EDF's tools and services remained accessible through the dedicated customer spaces on the site edf.fr and through the "*EDF & Moi*" mobile app. The EDF group also provided businesses with a "Restart Pack", *i.e.* a set of custom services to make the everyday life of businesses easier upon the resumption of activities (emergency assistance service, sanitary compliance support, etc.).

Since the start of the sanitary crisis, the EDF group's absolute priority has been to make sure it protects and preserves the health of its employees, as well as to guarantee the continuity of its public service missions in France. The Group set up specific organisational and sanitary measures to combat the Covid, particularly by providing personal protective equipment, changing the layout of premises, organising remote work, supplying 10,000 extra computer workstations and even ensuring the resilience of its computer network infrastructure, enabling the successful handling of 70,000 simultaneous logins.

In addition to these measures, and by virtue of the principle of shared vigilance, the Group's businesses have paid and continue to pay special attention to preventing psychosocial risks from affecting employees. Management endeavours to take account of each employee's individual personal and professional situation. Specific schemes were put in place such as a dedicated 24/7 listening and psychological support unit (not only accessible to employees but also their families and service providers), widespread e-learning and even publication of regular stress prevention and management content on the Group intranet platform. Social dialogue has remained active (see section 3.5.2.4 "Social dialogue").

In France, the Group paid bills owed to VSE and SME suppliers [3] prior to the expiry of the contractual 60-day payment period. The scheme covered services completed and approved by EDF on 31 March 2020, which saw EDF SA paying VSE suppliers before mid-April and SME suppliers before the end of April, without them having to take any specific measures. Dalkia and EDF Renewables also adopted an equivalent strategy, as did Enedis [4]. This payment period reduction initially covered nearly twenty thousand bills, totalling around €190 million Group-wide in France. The scheme was progressively extended until the end of the first half-year, in line with the end of the state of sanitary emergency on 10 July 2020. As a result, nearly €500 million were paid in advance to the Group's VSE and SME suppliers in France between April and June 2020.

With support from Fondation Abbé Pierre, EDF gave its employees in France the opportunity to help insecure households to pay their electricity bills, irrespective of their supplier. For every euro paid by employees to the *don d'énergie* (*i.e.* energy donation) scheme, EDF paid an extra euro to help fund energy insecurity prevention campaigns. In March 2020, just as France was entering its first lockdown, EDF decided to make its EDF HUMAN PACT employee engagement platform a key tool to boost social ties between employees working remotely and isolated individuals through associations spread all across France. This initiative is part of the "locked down but connected" programme, set up at the start of the lockdown, which enabled them to take action remotely on three high-priority themes: assisting isolated individuals, providing school support in disadvantaged areas, and supporting vocational integration projects. 1,200 employees signed up for this programme, which is still ongoing.

In Italy, during the first wave of the sanitary crisis from March to May 2020, Edison made a €1.5 million donation. In addition to supporting research, this donation helped health facilities in the most hard-hit areas and supported various projects combating the social consequences of the crisis identified by Edison employees and local communities. This donation was raised through an employee crowdfunding campaign, matched euro for euro by Edison.

For its part, the EDF group Foundation set up a €2 million Emergency & Solidarity Fund. Early projects supported by this fund included: distributing quality meals to healthcare personnel in France, supplying computers to allow young people in disadvantaged areas to study remotely, issuing service vouchers to homeless people, and even supplying mobile hygiene kits to vulnerable families and healthcare personnel in Africa.

(1) Also see the EDF group press releases published on this issue on 23 March, and 6, 16 and 17 April 2020.

(2) Also see section 3.3.4 "Energy insecurity and social innovation".

(3) VSEs and SMEs.

(4) Network operator, independently managed.

3.1 Carbon neutrality and the climate

In 2020, the EDF group set itself more ambitious goals to celebrate the fifth anniversary of the signing of the Paris Climate Agreement. The Group was thus certified by Science Based Targets with an improved CO_2 reduction trajectory well below 2°C, and set up dedicated governance, in line with the best practice recommendations of the Taskforce on Climate related Financial Disclosure (TCFD) [1]. The Group's climate strategy, which is in line with CAP 2030, features four CSR commitments: ambitious carbon trajectory, carbon offsett solutions, adapting to climate change, and developping of electricity uses and energy services.

CARBON NEUTRALITY AND THE CLIMATE

CSR COMMITMENTS	CONTRIBUTION TO THE UN SD GOALS	KEY PERFORMANCE INDICATORS
AMBITIOUS CARBON TRAJECTORY	7 ÉNERGIE PROPRE ET D'UN COÛT ABORDABLE; 13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES	EDF group direct greenhouse gas emissions (scope 1)
		Carbon intensity: specific CO_2 emissions due to electrical generation
		Installed net renewable electricity generating capacities
CARBON OFFSET SOLUTIONS	7 ÉNERGIE PROPRE ET D'UN COÛT ABORDABLE; 13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES	Qualitative evaluation
ADAPTING TO CLIMATE CHANGE	7 ÉNERGIE PROPRE ET D'UN COÛT ABORDABLE; 13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES	Qualitative evaluation
DEVELOPING ELECTRICITY USE AND ENERGY SERVICES	7 ÉNERGIE PROPRE ET D'UN COÛT ABORDABLE; 8 TRAVAIL DÉCENT ET CROISSANCE ÉCONOMIQUE; 11 VILLES ET COMMUNAUTÉS DURABLES	Number of smart meters installed
		EDF group's Electric Vehicles rate in the fleet of light vehicles

3.1.1 Group carbon trajectory

As the world's number one nuclear power producer and Europe's leading renewable energy producer, the EDF group today produces some of the lowest-carbon electricity in the world, contributing to the energy transition wherever the Group operates. Faced with the urgency of climate change, the EDF group has committed to going even further and is investing massively to build a CO_2-neutral energy future.

3.1.1.1 Group commitments

3.1.1.1.1 Achieving carbon neutrality by 2050

The EDF group was one of the first businesses, way back in 2018, to set itself the goal of contributing to achieving carbon neutrality by 2050. This commitment was reinforced and set out in greater detail in March 2020. In practical terms, this involves reducing the Group's direct greenhouse gas emissions to zero or near-zero by 2050, reducing indirect emissions as much as possible in accordance with national policies and, finally, setting up negative emissions projects to offset the Group's residual emissions over the same period. This goal covers greenhouse gas emissions within all Group scopes and for all Group activities in all geographical regions.

In February 2020, the EDF group joined the "Business Ambition for 1.5 degrees: our only future" initiative launched by the United Nations Global Compact, "We Mean Business and Science Based Target Initiative". This coalition currently features more than 300 businesses committed to achieving carbon neutrality by 2050 in order to limit global warming to 1.5°C above pre-industrial levels.

With this commitment, the EDF group also adhered to the United Nations "Race To Zero" initiative and signed up to the "Climate Ambition Alliance" [2] alongside more than 120 countries, 450 towns and cities, 45 investors and 1,000 businesses.

3.1.1.1.2 2030 goals recognised by the SBTi initiative

In 2020, the EDF group set itself new 2030 greenhouse gas reduction goals, covering both direct emissions (scope 1) and indirect emissions (scopes 2 and 3). On 7 December, these goals were confirmed to be line with the "Well Below 2°C" trajectory by the Science Based Targets initiative [3], based on its recently-published methodology specially developed for the electrical sector [4].

As a result, the EDF group is committed to the following 2030 goals:

- 50% reduction from 2017 levels of scope-1 and scope-2 emissions, also including non-consolidated asset emissions and emissions from electricity purchased (*i.e.* not produced) for sale to end customers;
- 28% reduction from 2019 levels of emissions from combustion of gas sold to end customers (scope 3).

Section 3.1.1.2 "Group greenhouse gas (GHG) report" and section 3.7.2 "Details relating to CSR information" provide detailed explanations of how these goals were set.

In line with these SBTi-approved goals, the EDF group set itself the following additional goals:

- 25MtCO_2e for Group scope-1 emissions in 2030;
- 35gCO_2/kWh for the carbon intensity of electricity and heat produced by the Group in 2030;
- 28% reduction from 2019 levels of all scope-3 emissions by 2030.

With these goals, the EDF group is aiming to maintain its leading position among the world's lowest-carbon electricity companies.

(1) Also see the EDF group press release of 10 December 2020
(2) Alliance created in September 2019 at the United Nations Climate Action Summit by the President of Chile, Sebastián Piñera.
(3) Initiative launched in the wake of the Paris Agreement in 2015 by the following four organisations: CDP, UN Global Compact, World Resources Institute and World Wild Fund.
(4) "Setting 1.5°C aligned science based targets – quick start guide for electric utilities", CDP, June 2020.

To achieve these goals, a greenhouse gas emission reduction trajectory was set for the EDF group's three scopes. This trajectory includes a 2023 milestone with the following intermediate goals:

- 28 to 30MtCO_2e for the Group's scope-1 emissions in 2023 (range taking account of post-sanitary crisis scenario uncertainties in particular);
- 23% reduction from 2017 levels of scope-1 and scope-2 emissions, also including non-consolidated asset emissions and emissions from electricity purchased (*i.e.* not produced) for sale to end customers;
- 10% reduction from 2019 levels of emissions from combustion of gas sold to end customers and 8% reduction of Group-wide scope-3 emissions.

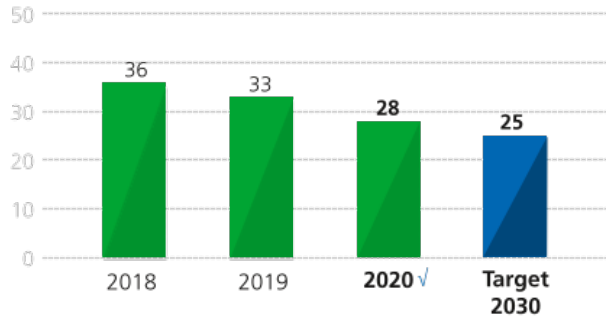
These 2023 and 2030 Group direct and indirect emissions goals were used to determine emission trajectories for all the Group's business lines and entities (see section 3.1.3 "EDF climate governance").

3.1.1.1.3 2020: an exceptional year in more ways than one

The sanitary crisis caused a slowdown in global economic activity and energy use in 2020, as well as an exceptional fall in greenhouse gas emissions. The Group's carbon intensity improved due to a sharp fall in production by our fossil fuel-fired power plants (particularly gas-fired facilities) and an increase in renewable production.

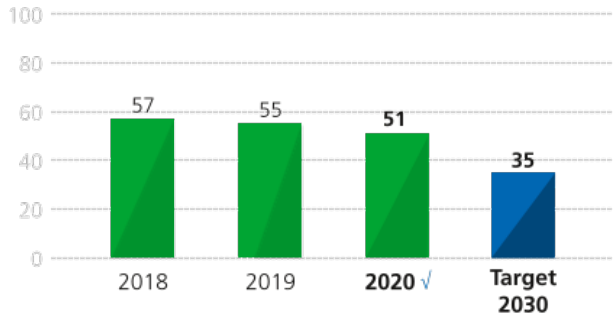
This partially offset the fall in low-carbon nuclear production, in part as a result of the sanitary crisis, which had a major impact on maintenance unit outages. Compared to the European electrical sector average, *i.e.* 275 gCO_2/kWh in 2019 (including France), the EDF group allowed 110Mt of direct CO_2 emissions to be avoided every year.

Scope-1 emissions (MtCO_2e) √



Key non-financial performance indicator
√ 2020 indicator subject to reasonable assurance check by KPMG S.A.
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

Carbon intensity: specific EDF group CO_2 emissions from production of electricity and heat (gCO_2/kWh) √



Key non-financial performance indicator
√ 2020 indicator subject to reasonable assurance check by KPMG S.A.
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.1.1.2 Group greenhouse gas (GHG) report

3.1.1.2.1 Industry-leading, long-term and comprehensive carbon compatibility

Because an effective mitigation strategy is impossible without precise knowledge of direct and indirect emissions, The EDF group began publishing a greenhouse emissions report ("GHG report") as far back as 2010, well ahead of both French and European regulatory requirements. The first EDF SA-wide GHG report was published in 2011 and the first comprehensive Group-wide report was published in 2017.

The EDF group's GHG report covers emissions of the six Kyoto protocol greenhouse gases (CO_2, CH_4, N_2O, HFC, PFC, SF_6) expressed in CO_2 equivalent (CO_2e) [(1)] for all significant items listed by the GHG Protocol [(2)], ranging from fuel production to employee office life.

The EDF group's GHG report is subject to third-party verification, covering more than 70% of emissions. EDF improves its approach every year and for the first time in 2020 included all the results in the non-financial performance statement for the reported year [(3)]. Currently, the EDF group publishes one of the most detailed GHG reports of any leading European electricity company, covering its entire value chain.

The EDF group consolidates all the non-financial data, including GHG emissions, of its "fully-consolidated" companies. This means that the emissions of companies over which the Group has financial control are fully consolidated into the Group's three GHG report scopes. For companies over which the Group does not have financial control, only scope-1 and scope-2 emissions are consolidated into the Group GHG report's "investment" item (scope-3 category 15), based on the equity method (*i.e.* by applying a ratio matching the Group's percent holding in the company).

(1) CO_2e emissions are calculated using the 100-year global warming potentials specified in the 5th IPCC report, i.e. 30 for CH_4, 23,500 for SF_6 and 265 for N_2O.

(2) The GHG Protocol is the carbon compatibility method most widely recognised internationally. Launched in 1998 by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), it was developed in partnership with businesses, NGOs and governments. It provides a set of resources, tools and data to calculate carbon footprints (http://www.ghgprotocol.org/).

(3) The EDF group GHG reports may be downloaded from the following address:
https://www.edf.fr/nos-engagements/indicateurs-de-developpement-durable/environnemental#bilan-des-emissions-de-gaz-a-effet-de-serre-du-groupe-edf.

The EDF group's GHG report scope includes the following businesses and their subsidiaries, based in France and more than thirty other countries: EDF, EDF PEI, Dalkia, Edison, Enedis, Électricité de Strasbourg, EDF Trading North America, EDF Energy Services, EDF in the UK, Framatome, EDF Renewables, Norte Fluminense, MECO, Luminus, EDF China. The main companies not controlled by the EDF group and included in scope 3 of the Group GHG report are as follows: Shandong Zhonghua, Datang San Men Xia, Fuzhou, Sloe, Nam Theun, Sinop, Enercal, Électricité de Mayotte, Generadora Metropolitana, Elpedison and Ibiritermo.

The emissions of companies not taken into account in the 2020 EDF group GHG report were considered to be non-significant as they account for significantly less than 5% of the emissions covered.

3.1.1.2.2 2020 GHG report summary

The following table presents trends in the Group's GHG reports between 2018 and 2020.

EDF group greenhouse gas report *($MtCO_2e$)*	**2018**	**2019**	**2020**
Scope-1 emissions	36	33	28
Scope-2 emissions	0.5	0.3	0.3
Scope-3 emissions	111	119	107

The following table presents the 3 most significant scope-3 items:

Significant scope-3 items *($MtCO_2e$)*	**2018**	**2019**	**2020**
Emissions from electricity purchased and sold to end customers	21	23	22
Emissions from gas sold to end customers	65	72	60
Scope-1 and -2 emissions from minority investments	10	10	10

Further methodological details of this data are provided in section 3.7.2.3 "Further details of other environmental, social and societal data included in the non-financial performance statement". The EDF group's detailed GHG report is published on the EDF edf.fr [1].

Scope-1 emissions fell by 16%. This fall was due, firstly, to the shutdown of various fossil fuel-fired facilities, including the Cottam coal-fired plant that closed at the end of 2019, and secondly, reduced operation of fossil fuel-fired facilities, particularly CCGs, due to the impact of the sanitary crisis on demand.

Scope-3 emissions fell by 11%. This fall was mainly due to the fall in sales of gas to end customers, which accounted for nearly 56% of Group scope-3 emissions in 2020.

3.1.1.3 Emission management measures

To achieve the greenhouse gas emission reduction goals it set itself (see section 3.1.1.1 "Group commitments"), the EDF group implements action plans in line with the EDF group's CAP 2030 strategy (see section 1.3 "Group strategy and goals"). This action plan is based on about 20 projects overseen by the Group's Executive Committee and coordinated by the EDF group Carbon Neutrality Strategy project (see description of climate governance in section 3.1.3.1 "Governance bodies").

By 2030, and in line with the CAP 2030 projects, the main actions enabling the EDF group to achieve these emission targets covering all three scopes are as follows:

Innovating by providing services and solutions for both customers and local authorities

- Promoting heat pumps and carbon-free heat to reduce demand for natural gas used for heating (residential customers, businesses and local authorities), in synergy with changing domestic regulations in countries designed to achieve carbon neutrality (*e.g.* RE 2020 in France);
- Reducing emissions from combustion of gas sold due to the increased injection rate of biogas (and potentially hydrogen) into domestic gas networks across Europe;
- Greening (use of renewable energy PPA's) of purchases of electricity for sale to end customers in countries where electricity has a high carbon intensity (*e.g.* North America).

Ramping up efforts to make our production activities carbon-free

- Closing the last coal-fired power plants operated by the Group in France and the United Kingdom;
- Achieving carbon neutrality goals of island regions, replacing oil used by existing fossil fuel-fired facilities with lower-carbon fuels (liquid biomass and potentially gas);
- Greening of Group-managed heat networks (biomass, free heat recovery, geothermal and ocean thermal energy conversion);
- Internationally, transferring combined cycle plants in Norte Fluminense and Phu My following expiry of "Build-Operate-Transfer" periods and applying strict development criteria to all new combined cycle projects;
- Reducing upstream fuel cycle (extraction, processing, transport) emissions as a direct result of falling use of fossil fuels (production and sale of electricity) by the Group.

Transforming our own practices

- Managing Group facility energy use:
- Fully electrifying the EDF group's light vehicle fleet in accordance with the EV 100 commitment;
- Reducing emissions from employee travel, particularly in view of the roll-out of EDF group's new travel policy;
- Measures to manage and reduce uncontained SF_6 emissions from electrical transmission and distribution systems as well as uncontained HFC emissions from air-conditioning units.

This set of measures allows the EDF group to secure its 2030 greenhouse gas emission reduction trajectory, in line with its commitments. The following sections provide a more detailed description of the Group action plan's most significant measures.

3.1.1.3.1 Coal-fired power generation, currently representing 0.4% of the total power generation, to be reduced to 0 by 2030

Since 2017, EDF group has been engaged in the "Powering Past Coal Alliance", which promotes the phasing out of coal in EU countries by 2030 and in the rest of the world by 2050 in the wake of the Paris Agreement. In 2019, EDF group went further and committed to stopping coal power generation by 2030 in all geographical zones.

For more than 20 years, the Group has not settled for merely disinvesting from coal but has established itself as one of the electricity companies that decided on, implemented and supported the closure of the highest number of coal and oil units in Europe. Between 1995 and 2020, this saw EDF group permanently shut down more than 30 coal-fired units and 42 high-power oil-fired units in Europe, respectively accounting for 6.3 and 7.2GWe in withdrawn capacities, totalling 13.5GWe, *i.e.* the approximate total installed electrical capacity of a country like Bulgaria or Finland. This coal (and oil) phase-out policy resulted in reduction of the European electrical sector's annual greenhouse gas emissions by more than 30$MtCO_2e$.

These closures were all backed up with measures to reassign employees within the Group and actions to develop new local economic activities (see section 3.4.3.2 "Redeployment and individual support").

The fossil fuel-fired power plant most recently shut down by the EDF group was the coal-fired plant at Cottam in the UK. This 2,000MWe power plant (4 coal-fired units) was permanently shut down in September 2019, representing a reduction of approx. 1.6$MtCO_2$ in the Group's direct emissions compared to the previous year.

(1) edf.fr/sites/default/files/contrib/groupe-edf/engagements/rapports-et-indicateurs/

At the end of 2020, the EDF group operated only three remaining coal-fired power plants: the Le Havre plant, set to be shut down in spring 2021; the West Burton A plant, set to be shut down by 2024; and finally the Cordemais plant (FR), which is set to be shut down by 2026 but may be reconverted to biomass as early as 2022 (also see section 1.4.1.2.2 "Issues relating to thermal generation"). In 2020, coal-fired heat and electricity generation accounted for less than 0.6% of the EDF group's total output. Irrespective of their capacity, these production assets are actually used only during "peak" periods to play a role in guaranteeing the balance of the system. As a result, their operation and subsequent emissions are very limited.

3.1.1.3.2 Energy transition in island regions

Corsica and the French overseas territories, as Non-Interconnected Zones (NIZ) in terms of the mainland power grid, are covered by specific Multi-Year Energy Programmes ("PPE"), which set them ambitious carbon-free and energy independence goals (energy independence of overseas territories by 2030 and Corsica by 2050).

Fossil fuel-fired facilities, mainly oil or diesel generators and combustion turbines (CT), have historically played a major role in these zones. They can handle highly-seasonal electricity use, guarantee a secure supply and mitigate intermittent renewable energy input into electrical systems that cannot be switched to imports in case of peak demand or production issues.

To achieve carbon-free electrical production in the islands, the EDF group has put in place the following actions:

- progressive replacement of oil with liquid biomass for the SEI micro-network generators (with tests lasting over a month on the Island of Molène, in Brittany) and PEI generators (with testing on the Pointe de Jarry plant in 2020). As a result, the future Larivot plant in Guyana will be powered with liquid biomass, replacing the "Dégrad-des-Cannes" fuel plant, which is set for shutdown by the end of 2023;
- shutdown of the oldest oil-fired combustion turbines (CT) and generators as and when new generation resources with lower emissions become available;
- voluntary implementation of an energy management system (ISO 50001 certification) on 7 of the 8 most important SEI fossil fuel-fired generation sites and output optimisation work on PEI facilities.

Section 1.4.4.3 "Island Energy Systems" provides a fuller description of the actions taken by EDF in the islands, such as measures to manage energy (*e.g.* solar water heaters), plans to increase the production capacity of active hydroelectric facilities, development of networks compatible with the integration of renewable energy (*e.g.* batteries, synchronous condensers, etc.).

3.1.1.3.3 Greener heating networks

The EDF group, through its subsidiary Dalkia, manages 330 urban heating and cooling networks. It is France's number one energy service provider and one of Europe's leading energy companies. Dalkia has set itself the goal of achieving 50% renewable and recovered energy (R&RE) in its energy mix by 2022, and achieved 41.3% in 2020.

This commitment has led to development of the use of biomass (wood energy, biodegradable household refuse, and biogas), recovery of waste heat, and geothermal and oceanic thermal energy conversion. Globally, coal accounted for 2.5% of 2020 heat production by Dalkia, which has committed to no longer use this fuel for its activities in France, in line with the provisions of the Multi-Year Energy Programme. Use of renewable energies and energy efficiency services enabled Dalkia to reduce its customers' greenhouse gas emissions and allowed 4.1 million tonnes of CO_2e to be avoided in 2020 (see section 1.4.6.1.1 "Dalkia").

3.1.1.3.4 Aligning the Group's gas activities with its climate commitments

Gas activities account for a significant share of the EDF group's GHG report, particularly through three activities: production of electricity from natural gas, production of heat from natural gas, and sale of natural gas to end customers (residential customers, businesses, and local authorities).

Because natural gas emits approximately two times less CO_2 than coal, and enables the production of electricity that can be managed ahead of time, it can play a role in the energy transition of some countries, like Italy where it replaces coal. Nevertheless, natural gas remains a fossil fuel, emits CO_2, and is incompatible (except in case of use of CO_2 capture and storage) with the achievement of carbon neutrality by 2050 to which the EDF group and more than 120 countries have committed.

In 2020, the EDF group set various internal "responsible gas" criteria to align its gas activities with its climate commitments:

- multi-disciplinary criteria: all the EDF group's gas activities fit into the carbon trajectories (covering both direct and indirect emissions) set for each of the Group's entities in line with the Group's 2030 goals. All development projects must demonstrate their contribution to the regional energy transition and integrate compliance with the Group's 2050 carbon neutrality plan into their business plan;
- additional electricity production criteria: no development of new gas projects (Combined Cycle Gas – CCG), unless the project contributes to reducing the carbon intensity of the country's electrical system or further secures its supply. When technically and economically feasible, the project uses solutions enabling reduction of its direct emissions, such as green gas, hydrogen or CO_2 capture and storage;
- additional gas sales criteria: the EDF group is assisting its gas customers to achieve sustainable energy use and energy efficiency and to reduce their emissions through its solutions, expertise and specialist subsidiaries; it develops and promotes alternative solutions to fossil fuels when accessible (electricity, heat pumps, renewable gas, renewable heat, etc.).

However, it should be noted that the EDF group's means of action to achieve this last goal are limited as long as regulators and public authorities fail to establish a clear regulatory framework, particularly promoting the selection of zero-carbon residential heating solutions.

Furthermore, the EDF group supports the development of the biogas sector, particularly through its subsidiary Dalkia Biogaz, a subsidiary fully-owned by Dalkia group, specialised in biogas production, processing and recovery activities, both for cogeneration and direct injection into the natural gas distribution network.

Finally, the EDF group is constantly working to optimise the energy and environmental performance of its fossil fuel-fired fleet in order to reduce its CO_2 emissions, as well as to provide more services to the electricity system as the latter is called on to incorporate an ever-higher quantity of intermittent renewable energy that cannot be managed ahead of time.

3.1.1.3.5 Reduction of SF_6 and HFC emissions

Fluorinated gases such as sulphur hexafluoride (SF_6) and hydrofluorocarbons (HFC) are powerful greenhouse gases. For example, the global warming potential of SF_6 is 23,500 times higher than that of CO_2 and the GWP of HFCs is up to 12,400 times higher than that of CO_2. Their emissions in 2020 were estimated for the entire EDF group to a total of 51.5ktonnes of CO_2e, *i.e.* approx. 0.2% of EDF group direct emissions (scope 1).

SF_6 is used as an insulating gas in electrical transmission and distribution systems. Emissions are produced by leaks and losses when these systems are serviced. In 2004, EDF signed a voluntary commitment to cut the SF_6 emissions of all of its high and medium-voltage electrical systems. These actions are monitored by the Group's Environmental Management System (EMS). Based on a proactive policy, the Nuclear Generation Division in France managed to reduce its SF_6 emissions by 84% between 2008 and 2017 and set up a plan of specific actions designed to restore all its facilities to their initial leakage rate, *i.e.* 1% a year. Distribution network manager Enedis has thus set itself the goal of stabilising its SF_6 emissions at 330kg per year.

Wherever technologically and economically possible, the EDF group uses alternative technologies to SF_6. A vacuum and pressurised dry air-insulated circuit-breaker (without SF_6) has been tested on an EDF Hydro production site. The same type of air insulation technology has been adopted for the EPR2 project's Energy Removal Platform [1]. The network distribution manager Enedis has developed a new technical series of high-voltage vacuum breakers for primary medium- and high-voltage substations, the first of which were installed in 2020.

(1) See section 1.4.1.1.3.2 "Other "New Nuclear" projects".

HFCs are used as refrigerating fluids in air-conditioning systems. Emissions are produced by leaks during both the production process and lifecycle. All EDF group business lines are working to cut the carbon impact of the refrigerating fluids they use. As a result, the EDF subsidiary Dalkia Froid Solutions uses green fluids (CO_2, ammonia, R290) for more than a third of its activities.

3.1.1.4 EDF, Europe's biggest investor in carbon-free energy

Along with actions to manage the greenhouse gas emissions of its activities, the EDF group is investing massively to prepare for the future and build a CO_2-neutral energy future. It shall be recalled that the Group's electricity generation mix in 2020 is 76.5% nuclear, 9.8% hydro, 3.8% other renewable energies, 8.4% gas, 1.0% fuel oil and 0.4% coal [1] (see section 1.1 "Key figures").

3.1.1.4.1 Close to 94% carbon-free investments

2020 EDF group gross operating investments totalled €16.5 billion. Based on these figures, the Group is by far the biggest investor in the energy transition in Europe, accounting on its own for more than 25% of industrial investments in the electrical sector [2].

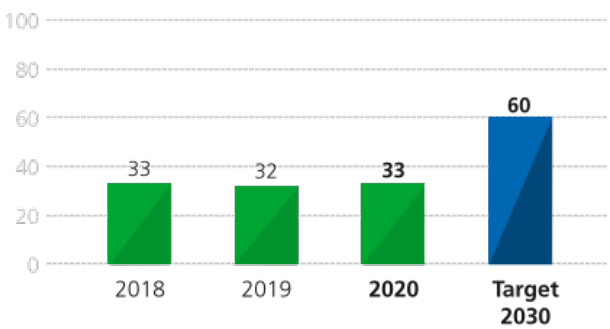
Overall, nearly 94% of EDF group investments in 2020 contributed directly to creating a carbon-free economy, whether through investments in carbon-free production facilities (renewable, nuclear), renovating electrical networks, deploying smart meters or developing energy services.

3.1.1.4.2 Doubling of installed renewable energy capacities between 2014 and 2030

The EDF group is today the biggest renewable energy producer in Europe, with production in 2020 of 68.7TWh of electricity and 8.6TWh of renewable heat through hydroelectricity, wind turbines, photovoltaic solar power and other renewable energies.

In accordance with its CAP 2030 strategy, it set itself the goal of more than doubling its installed net renewable capacity between 2015 and 2030, increasing it to 60GWe by 2030. In 2020, the Group's installed net renewable capacity was 33.3GWe.

Installed net renewable electricity generating capacities (GW)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

To achieve this goal, the EDF group committed to accelerate its investments in renewable energies both in France and internationally, by allocating an average of more than €2 billion gross per year to renewable activities over the 2017-2020 period.

EDF was ranked in 2019 as one of the top 10 "green" companies in the world and one of the five most dynamic European companies in terms of renewable energy development [3].

3.1.1.4.3 Innovation supporting the energy transition

The energy transition requires us to explore innovative solutions and work with start-ups. This is what led EDF to set up EDF Pulse Croissance in 2017. As both an investment fund and a start-up incubator, EDF Pulse Croissance's priority is to explore four strategic fields:

- sustainable town and country planning;
- residential services (connected home, energy conversion and optimisation, renovating homes to meet the needs of senior citizens);
- decentralised energy services (decentralised systems integrator, decentralised off-grid and nano-grid production, storage); and
- industrial performance for business customers (predictive maintenance and fault detection, industrial process improvement, fleet mobility and management, nuclear decommissioning).

See section 1.4.6.1.3 "EDF Pulse Croissance" for a detailed description of its achievements, such as the creation of the Hynamics subsidiary in 2019, dedicated to the production and commercialisation of low-carbon, water electrolysis-renewable hydrogen.

3.1.1.4.4 R&D for the energy transition

At the end of 2020, EDF R&D had a total of 1,839 employees in France, featuring 30 different nationalities, and had one of the highest R&D budgets out of the biggest electricity companies (see section 3.5.2.5.8 "R&D").

To be able to identify solutions with the lowest environmental footprints, EDF's R&D teams work specially on analysing different electricity and hydrogen production process lifecycles. This standardised approach enables integration of environmental impacts both upstream (extraction of raw materials, manufacturing, construction of infrastructure, etc.) and downstream (recycling, decommissioning, waste management, etc.) based on multiple criteria, *i.e.* not only in terms of greenhouse gas emissions but also potentially depletion of resources, water footprint, waste production, protection of biodiversity, etc.

So according to the IPCC [4], greenhouse gas emissions based on a lifecycle approach for one electrical kWh produced by a nuclear facility are 12g/kWh, given that the wind turbine (on shore) and photovoltaic solar segments respectively have a carbon footprint of 11 to 44g/kWh (see section 1.5 "Research and development, patents and permits").

(1) In consolidated data.
(2) 6th European energy company financial ratings Watt's Next Conseil, September 2020 (wattsnext.fr/).
(3) Energy Intelligence, Green utilities report, 2019 (www.energyintel.com/).
(4) IPCC Assessment Report 5, 2014, Working Group III – Mitigation of Climate Change, Annex III, Table A.III.2 (Emissions of selected electricity supply), medium values.

3.1.1.5 Carbon offsetting solutions [1]

3.1.1.5.1 EDF group commitment

For the EDF group, use of carbon offsetting is the final stage of a process to achieve neutrality, based on the "Avoid-Reduce-Compensate" approach, as already applied to biodiversity and many other fields. Carbon offsetting must not under any circumstances take the place of a strategy designed to drastically reduce the Group's emissions, whether direct or indirect.

The EDF group is focusing on the use of "negative emissions" projects to offset its residual emissions by 2050, compared to "avoided emissions" projects. This can include technological solutions, such as Bio-Energy with CO_2 Capture and Storage (BECCS), or natural solutions, such as carbon sequestration in forests and soil.

In accordance with current carbon compatibility rules [2], emission credits from carbon offsetting are not currently deducted from the EDF group greenhouse gas report and are accounted for separately.

3.1.1.5.2 Group initiatives and management

In addition to achieving carbon neutrality by 2050, carbon offsetting can enable an immediate contribution to the transition towards a low-carbon society and meet the expectations of EDF group stakeholders: by contributing to creating carbon-"neutral" solutions, and involving staff and employees in actions in favour of the climate.

Early carbon emission offsetting initiatives are springing up everywhere, including:

- **Solutions**: the Trading Division developed the "*Avantage gaz durable*" (*i.e.* "Sustainable gas advantage") gas supply solution, which is a gas solution featuring offsetting of the emissions from its combustion, for its customers in France. This offsetting is managed by EDF Trading through purchasing of credits certified by the United Nations generated initially by a biomass project in China and currently by a wind turbine project. Regarding Luminus, it offers a range of carbon-neutral gas solutions. The "EcoFix Gas" solution is a 3-year, fixed-rate CO_2-neutral solution. The "EcoFlex Gas" solution is also a CO_2-neutral solution but with a variable price indexed every 3 months. The "#BeGreen Fix" solution is also a 1-year, fixed-price carbon-neutral solution;
- **Commitment by employees and customers**: Enedis has partnered with the NGO "Reforest'Action" to take action in favour of the reforestation of areas hit by natural disasters. Enedis is funding the planting of 1 tree for every 20 customer accounts opened following the installation of Linky smart meters. Enedis is a Reforest'Action "Gold Contributor", and has planted 50,000 trees since March 2018;
- **Travel**: Citelum has an offsetting programme with the "Reforest'Action" organisation to offset emissions from business trips. For the purposes of this scheme, it purchases carbon credits certified by VCS (a project to avoid deforestation in Brazil). The EDF group Foundation offsets travel emissions generated by international patronage through the "Good Planet" Foundation, by funding both manufacturing of solar-powered cookers in Peru and Bolivia and installation of biodigesters in India. The International Division also offsets its emissions generated by business trips with the Good Planet Foundation;
- **Finance**: through its subsidiary EDF Trading, the EDF group has a diversified carbon credit portfolio and extensive experience in voluntary carbon offsetting markets.

Also see the actions described in section 3.2.1 "Biodiversity".

The EDF group is developing a methodological framework and appropriate governance to study Group initiatives on a case-by-case basis and guarantee their consistency with Group commitments and Corporate Social Responsibility.

3.1.1.5.3 R&D support

The EDF group R&D Division is implementing the Group's strategy to achieve carbon neutrality by 2050 by actively monitoring negative emissions technologies and more specifically exploring the following solutions:

- **CO_2 capture and storage (CCS)**: the EDF group already has solid skills in this field, having participated in several international research projects and created a capture demonstrator on its Le Havre site. This €22 million demonstrator (25% co-funded by ADEME, *i.e.* the French Environmental & Energy Management Agency) has captured 1,900 tonnes of CO_2 and enabled the technical and economic feasibility of several processes to be determined. An alternative to storage is recovering carbon dioxide captured in a different chemical form (fuels, materials). Applied to bioenergy (considered to be CO_2-neutral), CCS is becoming a way to generate negative CO_2 emissions (BECCS) and could play a major role by 2050 in countries committed to achieving carbon neutrality;
- **solutions based on nature**: these practices, like afforestation (planting trees in an area where no trees have grown for many years), reforestation, proper management of pastures and wetlands or even modification of farming practices, now appear among the most promising potential ways to increase carbon sequestration in soil and forests, and accordingly generate negative emissions. The EDF group is the third biggest land manager in France, with more than 40,000 hectares of land featuring not only production sites but extensive countryside (including 7,000 hectares of forests and 7.5 billion m^3 of water in its reservoirs). The EDF group R&D Division is working to assess (a) the potential of the Group's land to store carbon and (b) the synergies and potential contradictions of carbon offsetting with other ecosystem services, including preservation and biodiversity;
- **atmospheric CO_2 capture technologies** (DAC, i.e. Direct Air Capture). These technologies are still at the experimental stage. In November 2020, EDF in the United Kingdom published a call for expressions of interest to set up a direct air CO_2 capture demonstrator on the site of the project of Sizewell C nuclear power plant. Two innovative technologies are set to be tested in this project, with the long-term goal of being able to make the power plant's carbon footprint completely neutral, or even negative.

(1) Carbon offsetting consists of financing a project enabling avoidance or sequestration of greenhouse gas emissions by purchasing carbon credits. The underlying principle of carbon offsetting is that the impacts of one tonne of carbon emitted in one place can be neutralised via sequestration (i.e. long-term storage outside the atmosphere) or reduction of another tonne of carbon elsewhere. Carbon offsetting is covered by different international certifications (Gold standard, Verra, UNFCCC Clean Development Mechanism) or domestic certification schemes (Bas Carbone (i.e. Low carbon) in France, Woodland Carbon Code in the United Kingdom) that all meet strict measurability, verifiability, permanence and additionality rules - i.e. only projects both designed for carbon offsetting from day 1 and funded by generated carbon credits are eligible.

(2) GHG Protocol Corporate Accounting and Reporting Standard, WRI-WBCSD, 2015.

3.1.2 Climate change adaptation strategy

EDF's facilities have a technical lifespan potentially easily exceeding 40 years (hydroelectric facilities, nuclear power plants, power grids), making it, among non-nationalised companies, one of the major firms most exposed to climate change.

The strategy and actions set up by the EDF group enable management of climate change risks, particularly physical risks. 2020 is a fine illustration of this fact, and was recognised as the hottest year ever recorded in France since measurements began back in 1900, and one of the three hottest years ever recorded worldwide.

3.1.2.1 From climate disaster plan to global resilience strategy

By 1999, the storms Lothar and Martin had already led EDF to work on mitigating the physical impact of climate change on its activities. The EDF group developed a climate incident plan in 2004, followed by a climate change adaptation strategy in 2010. This document lays out the foundations of the Group's commitments in terms of adaptation, and identifies actions to be implemented across all business lines: evaluating the impacts of climate change on future and existing activities; adapting existing installations to make them less sensitive to climatic conditions and more resilient to extreme weather events; incorporating climate change scenarios in the design of new installations; and adapting the Group's solutions, internal operations, and expertise to encompass climate change.

The EDF group adaptation strategy covers first and foremost production facilities with a lifespan of over 40 years, such as nuclear power plants and hydroelectric dams. Wind and solar farms, being less cumbersome, easier to decommission, and with a typical lifespan of less than 20 years, are considered as being less exposed to the physical risks of climate change.

All EDF group entities are required to take account of climate risks in mapping their risks, including both physical risks and "transition" risks [(1)]. The entities most exposed to physical risks have climate change adaptation plans, which must be updated at least every 5 years.

3.1.2.2 An internal climate department, unlike any other major electricity company

Immediately after publication of the IPCC's first report in 1990, the EDF group resolved to develop internal skills focusing on climate issues, in collaboration with key organisations such as Météo-France (*i.e.* the French meteorological office). Unlike any other major electricity company, the EDF group now has a team of some fifteen permanent researchers investigating the consequences of climate change on its existing and future production fleets for nuclear, hydro, wind, and solar power, etc., changes in production potential from renewable energy, and trends in energy demand.

EDF R&D's climate department was set up in 2014. It acts as an interface between constantly-changing scientific knowledge about the climate and the EDF group's business lines. It provides the Group's different business lines with climate data that can be used immediately to quantify climate-change-related risks and develop appropriate adaptation plans. EDF systematically takes the IPCC's worst-case scenario (currently, RCP 8.5) into account in its impact and design studies. The EDF group has also developed an operational unit to monitor meteorological phenomena and forecast their impact on water catchment sources: groundwater, rivers, and the sea. Located in Grenoble, this unit provides 24/7 monitoring of hydro-meteorological phenomena that represent a risk to EDF's production fleet.

Overall, more than 80 EDF group employees work on meteorology and climate to manage production facilities and balance supply and demand.

3.1.2.3 Adaptation of nuclear power plants

Resilience to extreme natural phenomena has always been taken into account in the safety rules imposed by the Nuclear Safety Authority (ASN) for France's Basic Nuclear Facilities (BNFs). The aim of the adaptation actions launched by EDF, in particular since France's 2003 heatwave, has been to increase the safety margin and maintain production levels during such periods; in 2003, some power plants had to reduce output so as not to further heat river water, leading to a production loss of 5.5TWh, equivalent to 1% of EDF's production that year.

The "*Grands Chauds*" ('Heatwaves') plan launched in 2008 resulted in EDF making improvements to cold water source cooling efficiency for some of its power plants, and hardening reactor building electronics so that they can withstand temperatures in excess of 50°C.

All EDF group power plants currently under construction (including Flammanville 3 and Hinkley Point C) have been designed taking into account the most recent climate scenarios; in particular, this has involved revising the rise in sea levels upwards.

In 2020, the total loss of production due to climate events at nuclear facilities was 3TWh, particularly due to a total of 80 days of unit shutdowns in Chooz (for comparison: 1.4TWh in 2019 and 2.7TWh in 2018). This was the biggest production loss due to the environment since 2003. However, the requirements applicable to the Chooz plant are highly specific to its cross-border location, as it is historically covered by a diplomatic agreement between France and Belgium requiring withdrawals to be stopped once the Meuse River falls below a given flow rate limit.

Overall, since 2003, loss of production by nuclear power plants due to high temperatures has been on average only 0.3% per year.

3.1.2.4 Adaptation of hydroelectric facilities

To increase resilience to extreme weather events and the risks relating to a huge influx of water into reservoirs, the EDF group has developed and installed innovative technology known as the "Piano Key Weir" (PKWeir) on nine of its hydropower infrastructures. This technology allows much more water to be released without increasing the size of the dam. EDF received an award recognising this innovation in the field of adaptation to climate change at the COP21 United Nations Climate Change Conference in Paris.

In 2019 EDF carried out spillway recalibration works on the *La Palisse sur la Loire* dams (Ardèche), raising the abutments and reinforcing downstream scour protection, as well as works on the Sainte-Marguerite dam on the Chassezac (Lozère and Ardèche), installing active truss rods to reinforce the dam against high water levels.

Another example of how the EDF group is adapting its hydropower fleet to climate change is the work done in 2006 to raise the "Les Bois" reservoir water intake in the Mont-Blanc massif by several metres, thus taking into account and anticipating the shrinkage of France's largest glacier, the Mer de Glace.

3.1.2.5 Adjustment of distribution networks

In the aftermath of the 1999 storms, the distribution network manager Enedis set up the Electricity Rapid Intervention Force (or *Force d'intervention rapide électricité*, FIRE) enabling resources and staff to be redeployed nationwide to restore power as quickly as possible. FIRE is one of the EDF group's key measures to respond to extreme weather risks. FIRE currently has 2,500 technicians trained for crisis situations and 11 logistics storage facilities across the country, allowing the deployment of 2,000 generators.

2020 was marked by a summer heatwave that resulted in a series of successfully-managed incidents in major cities, and above all storm Alex in the first days of October, which caused flooding and widespread damage in three valleys in the Alpes Maritimes. In 2020, FIRE intervened on six occasions.

Distribution network manager Enedis is also working on reducing the vulnerability of its 1.4 million kilometres of networks. This mainly consists in burying high-voltage overhead lines to avoid risks of falling trees, wind, snow and frost, beginning with the most exposed facilities. In 2020, 2,504km of high voltage overhead lines and 5,108km of low voltage overhead lines were removed. In the island regions, 95% of new networks are built underground.

(1) See section 3.9.4 "Summary of EDF Group climate risks".

3.1.3 EDF climate governance

3.1.3.1 Governance bodies

The EDF group's climate strategy governance forms part of its sustainable development governance (see section 3.5.2.3.3 "The Sustainable Development Department"). This is supervised, in accordance with the independent management of the network's infrastructure managers, at the top Group level.

Stronger governance in 2020

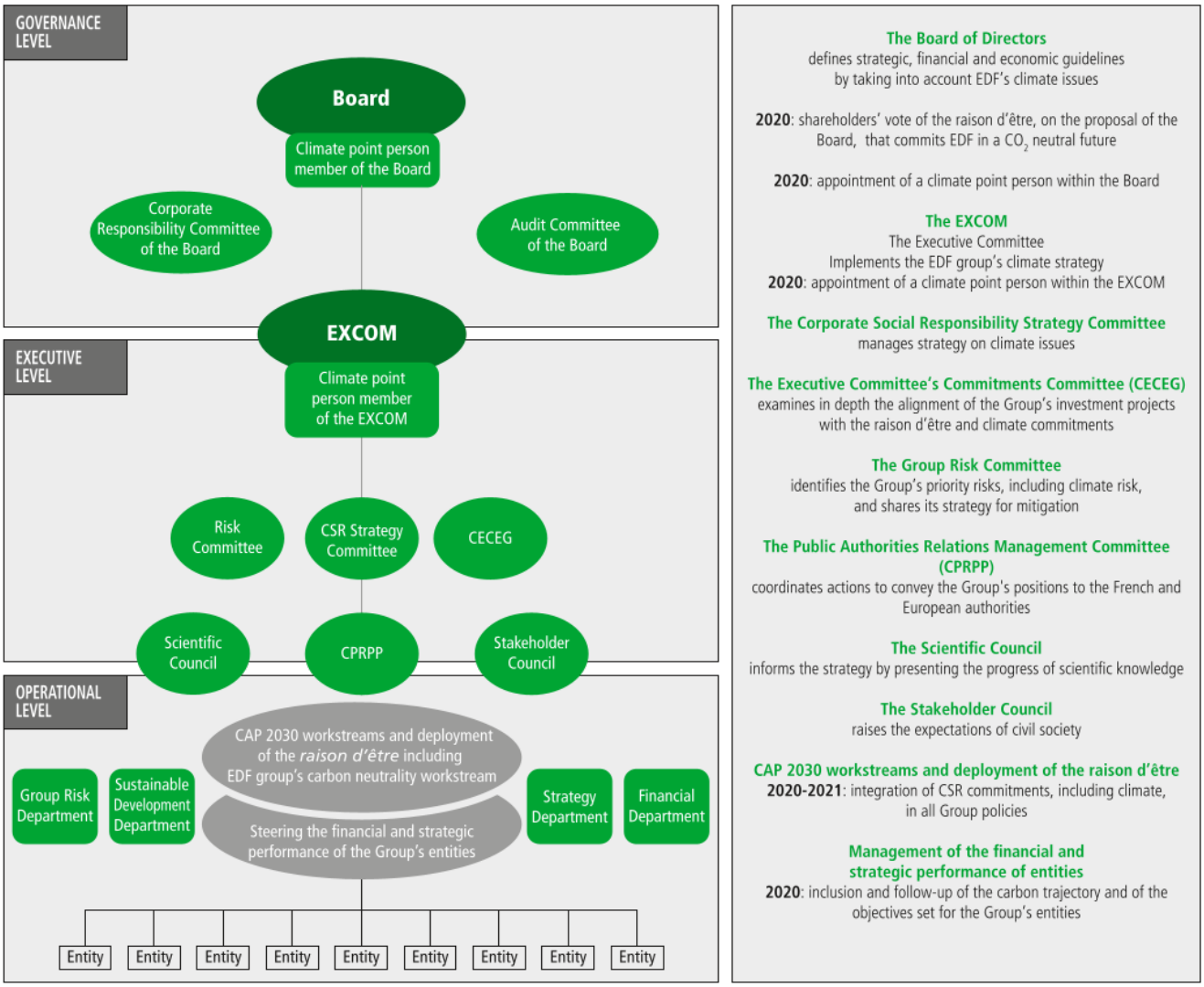
In December 2020, to bolster its climate governance, and in line with the highest TCFD standards, the EDF group appointed Climate point persons within its Executive Committee and its Board of Directors[1] :

- **the Group Senior Executive Vice-President, in charge of Innovation, Corporate Social Responsibility & Strategy**, Alexandre Perra, is Climate point person within the Group Executive Committee. In this capacity, he presents the Group's carbon-neutrality ambition at the Board's Corporate Social Responsibility Committee and at the Board itself;
- **the Chairwoman of the Corporate Responsibility Committee,** Claire Pedini, is the Climate point person within the Board. In this capacity, she ensures, in liaison with the Chairman of the Board of Directors and the Executive Committee's Climate point person, that the Board identifies all impacts of climate change for the Group and that the work undertaken by the Board as well as the latter's strategy include considerations pertaining to climate change.

Governance bodies

- **The Board of Directors** establishes the Group's strategic, economic, financial, and technology orientations, taking climate issues into consideration. The Board of Directors regularly examines climate change risks and opportunities and includes the Group's climate strategy in strategic decisions. In October 2019, a specific brief on climate risks was presented to the Board of Directors' Audit Committee. In April 2020, the Group's new carbon trajectory to achieve carbon neutrality was presented to the Board of Directors' Corporate Responsibility Committee. In February 2020, the Board of Directors decided to recommend adding the EDF's *raison d'être* to its articles of association [2];
- **The Executive Committee** implements the Group's climate strategy, which was an integral part of the non-financial performance statement approved by the Board and presented to shareholders. The Group Senior Executive Vice-President in charge of Innovation, Corporate Sicial Responsibility and Strategy is the Executive Committee's Climate point person. Each year, the Executive Committee examines and validates the Group's carbon-free trajectory. In January 2020, the Executive Committee approved the Group's strategy to achieve carbon neutrality by 2050 (presented at the General Meeting in May 2020). In October 2020, it approved the Group's new goals to reduce emissions by 2030, opening the way for SBTi certification of the Group's carbon trajectory [3];
- **The Executive Committee's Commitments Committee** features the Group Senior Executive Vice-Presidents and is a specialist EXCOM body. It examines the alignment of the Group's strategic projects with its *raison d'être* and climate commitments in depth. The investment projects brought before the Group's decision-making bodies that are likely to cause significant direct or indirect greenhouse gas emissions include a verification of their consistency with the Group's carbon-free trajectory and with the energy transition dynamic in the countries in question. For the first time in 2020, 2030 carbon trajectories were set for all the Group's entities, objectives were set for each entity and will be monitored as part of the process to manage the Group's financial and strategic performance (see section 2.1.2.4 "Reliability of financial information – internal accounting and financial control/Organisation of financial risk management");
- **The Corporate Social Responsibility Strategy Committee**, which features the Group's Senior Executive Vice-Presidents, examines all climate issues in depth and handles their strategic management and coordination. This Committee, created in 2019, is currently chaired by the Senior Executive Vice-President, Innovation, Corporate Responsibility & Strategy. In April 2020, the Committee examined the CAP 2030 carbon neutrality strategy plan;
- **The Public Authorities Relations Management Committee** coordinates actions to promote the Group's positions in relation to French and European authorities. It is co-chaired by the Senior Executive Vice-President, Innovation, Corporate Responsibility & Strategy, and meets on a weekly basis. The SEVP, Executive Coordination & Governmental Relations, takes the role of Secretary;
- **The Stakeholder Council**, featuring external personalities representing the EDF group's different issues, enables identification and examination of the expectations of civil society in terms of combating climate change (see section 3.5.1.2 "Stakeholder panels");
- **The Scientific Council** is regularly called on to guide EDF's climate strategy by presenting advances in scientific knowledge in the field (particularly from the IPCC, *i.e.* Intergovernmental Panel on Climate Change) and proposing strategic orientations for the EDF group's R&D Division (see section 3.5.1.2 "Stakeholder panels");
- **The Group Risk Division ("DRG")** ensures that all entities examine climate risks (physical and transition risks) in their risk mapping, which is updated annually. The DRG coordinates the updating of EDF group policies and, in collaboration with the DDD, ensures that each update includes a specific analysis to verify its consistency with the Group's climate strategy;
- **The Sustainable Development Department ("DDD")** is responsible for operational monitoring of the EDF group's climate change-related actions and indicators for implementation of the Group's sustainable development policy. It works in liaison with the Corporate Divisions and subsidiaries concerned, backed by the Group's Environmental Management System (EMS), Environment Board, Sustainable Development Committee (SDC), and Stakeholder Council.

(1) See also the EDF group press release of 10 December 2020.
(2) See Chapter 4.
(3) See Chapter 4



3.1.3.2 Implementation of Task Force on Climate-related Financial Disclosures (TCFD) recommendations

3.1.3.2.1 The EDF group and the TCFD

The TCFD (Task force on Climate-related Financial Disclosures) is a G20 Financial Stability Board (FSB) working group set up after the 2015 COP 21 conference with a view to improving companies' financial transparency in climate-related matters. The EDF group was one of the world's first organisations to commit to supporting this approach and is officially listed on the TCFD site as a "TCFD supporter" [(1)].

The TCFD [(2)] recommendations set out the climate reporting components companies are expected to provide in their reference documents, in four broad areas: governance, strategy, risk management, and indicators. Since 2018, the EDF group's non-financial performance statement has included a concordance table enabling exhaustive identification of the Group's responses to the TCFD's recommendations (see section 3.9.3 "Further details relating to compliance with TCFD requirements").

The EDF group also responds every year to questionnaires from non-financial rating agencies specialised in analysing corporate strategies to combat climate change. One of the best-known is the CDP (originally "Climate Disclosure Project") questionnaire, which is structured to match the TCFD's recommendations. The EDF group's response to the CDP questionnaire is public. Section 3.8 "Non-financial rating" features all the EDF group's 2020 reporting results.

3.1.3.2.2 Identifying climate change risks and opportunities

To assess climate risks, the EDF group uses the classification proposed by the TCFD that distinguishes between physical risks (extreme and chronic climate events) and transition risks (legal risks, political and regulatory risks, customer-market risks, technological risks, financial risks).

The EDF group identified climate risk as a priority in 2018, addressing it in a report from the Group's Scientific Council in March 2019, as well as in the detailed analysis presented to the EDF group's Executive Committee and the Board of Directors Audit Committee in October 2019. section 3.9.4 "Summary of EDF group climate risks" provides a detailed description of the risks and opportunities identified in this analysis, as well as their potential impact on the Group's business. These risks are also listed in section 2.2.3 "Group transformation and strategic risks", risk factor 3B, "Adapting to climate change: physical and transition risks".

(1) fsb-tcfd.org/tcfd-supporters.

(2) Recommendations of the Task Force on Climate related Financial Disclosures, TCFD, June 2017.

3.1.3.2.3 Scenario-based approach to verify corporate resilience

Physical risk scenarios

To assess the physical risks of climate change (chronic and acute), the EDF group uses long-term trajectories known as RCPs (Representative Concentration Pathways) developed by the IPCC [(1)]. These trajectories describe different climate futures, which are all considered possible depending on the quantities of greenhouse gases emitted in coming years. They are identified by the resulting 2100 radiative forcing value: the higher this value, the more energy the earth-atmosphere system absorbs and the more it warms. So an RCP of 2.6 is associated with radiative forcing of 2.6W/m^2 and is the only IPCC scenario enabling compliance with the Paris Agreement, whereas the most pessimistic scenario, RCP 8.5, results in estimated warming of between 2.6°C and 4.8°C.

The EDF group systematically integrates the highest-impact climate scenario (*i.e.* RCP 8.5) into risk assessments of its facilities. These assessments were carried out for all the Group's nuclear facilities and are mandatory for all new nuclear or hydroelectric power plants. Several modifications were made based on these assessments, including the design of the water inlets at the British Hinkley Point C nuclear power plant to take account of the high sea level.

Transition risk scenarios

Worldwide, the electricity and heat production sector is the number one greenhouse gas-emitting sector, accounting on its own for 25% of global emissions [(2)]. In France, as a result of the EDF group's carbon performance, the electricity and heat production sector accounts for only 6% of national man-made greenhouse gas emissions [(3)]. As demonstrated by the IPCC [(4)], trajectories involving no exceeding, or minimal exceeding of the goal of 1.5°C, can be achieved only with increased electrification of uses combined with an accelerated switch to carbon-free electricity. As a result, the share of electricity in end energy use should rise Europe-wide from 22% today to more than 50% by 2050, in most of the scenarios [(5)] aiming to achieve carbon neutrality.

To assess transition risks (legal, technological, market, reputation), the EDF group uses medium-term scenarios (2030-2050), in national scopes (such as the French National Carbon Strategy, adopted in 2020) or regional scopes (such as the European Union's long-term strategy and the "Decarbonisation Pathways" sectoral study supervised by Eurelectric and to which the EDF group contributed in 2018).

The EDF group has an atypical exposure profile to transition risks, and political risks in particular, compared to most other energy companies worldwide. In fact, with a >90% carbon-free production mix, bolstering of policies to achieve carbon neutrality, such as increasing European greenhouse gas market prices, constitute major opportunities for the Group to showcase its strengths.

3.1.3.2.4 Use of the price of carbon to guide investments

The EDF group's investment projects were analysed based on the CAP 2030 strategy and its commitment to achieve carbon neutrality for all its direct and indirect emissions by 2050. For all countries covered by the EU-ETS (European greenhouse gas emissions trading system), through which the majority of EDF group investments are made, the sensitivity of the profitability of projects in terms of production is also assessed based on medium- to long-term scenarios based on different 2050 emissions price trajectory forecasts.

These scenarios and the related carbon price trajectories are developed taking account of various parameters, particularly GDP growth, raw material prices, technology costs, and climate and energy regulations. In its response to the 2020 CDP questionnaire, EDF stated, for example, that the carbon price range currently taken into account in its scenarios was €$_{2019}$24 to 100/t.CO_2 by 2040.

By enabling identification of project risks and opportunities and testing their climate change resilience, this analysis, based on scenarios integrating different carbon price trajectories, contributes to guiding the Group's investments.

3.1.3.3 EDF and sustainable finance

3.1.3.3.1 Alignment with European taxonomy

The EU Taxonomy is the first and certainly most important measure of the "Financing Sustainable Growth" action plan, launched by the European Commission in March 2018. In the long term, it should enable regulation of the "green" or "sustainable" financial products market.

It addresses a key issue, with the aim of channelling investments into essential technologies and projects to achieve European climate goals and carbon neutrality. Along the same lines, the Intergovernmental Panel on Climate Change (IPCC) as well as the International Energy Agency (IEA) have confirmed that nuclear power is one of the solutions to limit global warming and achieve the goals of the Paris Agreements.

Based on both these observations and scientific studies, EDF considers nuclear power to have its place in the European taxonomy, because it enables reduction of CO_2 emissions, in Europe and worldwide, and makes a substantial contribution to mitigating climate change (1st goal of taxonomy).

In 2020, nearly 94% of Group investments were made in accordance with the Group's low-carbon goals [(6)], with 51% investments in the nuclear sector, and 43% aligned with the European sustainable taxonomy [(7)], particularly including production of renewable energy (hydroelectric, wind, solar, etc.), power grids and energy services. These figures are likely to be revised based on the "Taxonomy" regulation, particularly with the publication of delegated acts in 2021.

3.1.3.3.2 Issue of Green Bonds

EDF is a leading issuer on the Green Bonds market. As such, since November 2013, it has issued the equivalent of approximately €6.9 billion Green Bonds (including €2.4 billion of convertible Green Bonds in 2020 [(8)]) to support its development in renewable energies. After two first issues designed to finance the construction of new wind and solar projects by its EDF Renewables subsidiary, then extension in 2016 to financing of investments to renovate and modernise hydroelectric assets in mainland France, the EDF group updated its Green Bond Framework in January 2020 to integrate best market practices and extend the scope of investments eligible for energy efficiency and biodiversity projects, both in France and internationally.

So far, EDF group Green Bond issues have contributed to financing about 30 wind and solar projects and more than 800 operations to renovate, modernise and develop existing hydroelectric facilities in France, enabling the avoidance of more than 6 million tonnes of CO_2. Green Bonds are fully integrated into the Group's financing policy. EDF is an active member of the governance of the Green Bond Principles [(9)] and co-founder of the Corporate Forum on Sustainable Finance [(10)] (see section 6.7 "Information on allocation of funds raised through Green Bonds issued by EDF").

(1) Assessment Report no. 5, IPCC, 2014.
(2) Assessment Report no. 5, IPCC, 2014 (2010 data).
(3) SECTEN Inventory, CITEPA, July 2020, (2019 data).
(4) IPCC special report Global Warming 1.5°C, October 2018.
(5) EU Long Term Strategy scenarios, November 2018.
(6) Figures in line with the consolidated financial statements at 31 December 2020.
(7) According to the currently-defined method based on the March 2020 TEG report.
(8) See the EDF group press release of 8 September 2020.
(9) www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bonds-Principles-June-2018-270520.pdf
(10) https://www.edf.fr/groupe-edf/espaces-dedies/journalistes/tous-les-communiques-de-presse/les-principaux-emetteurs-europeens-d-obligations-vertes-lancent-le-corporate-forum-on-sustainable-finance

3.1.3.3.3 More than €5.5 billion of lines of credit indexed on the Group's corporate responsibility commitments

Since 2017, the Group has set up five lines of credit with their cost indexed on three Group climate commitment performance indicators: EDF group direct CO_2 emissions, automobile fleet electrification, and use of online energy use monitoring tools by its French residential customers. In 2020, the EDF group and Standard Chartered Bank set up a €200 million renewable credit line, increasing all the renewable credit lines indexed on ESG (Environmental, Social & Governance) criteria to more than €5.5 billion, *i.e.* approximately 52% of the Group's total credit lines, demonstrating that sustainable finance tools are central to its financing strategy (see section 5.1.6.1.1.2 "Liquidity risk management").

3.1.3.4 Commitment to ambitious climate policies

The EDF group promotes public policies that encourage actual carbon reduction in the economy. Some of the Group's recent public positions and actions to raise general public awareness of climate change are presented below.

3.1.3.4.1 On a national level

During the 2018 public debate on the multi-year energy programme (PPE or *Programmation pluriannuelle de l'énergie*), EDF's stakeholder brief [(1)] clearly positioned combating climate change as a priority in its strategy [(2)]. In August 2019, EDF joined the French employer federation MEDEF's "French businesses' climate engagement" [(3)] initiative, reasserting the need for a collective change of direction, with the acceleration of innovation and R&D through investment in low-carbon solutions.

3.1.3.4.2 On a European level

The EDF group is particularly active in the EU, both in its own name (through its permanent office in Brussels) and through Eurelectric, the association representing the common interests of the electricity industry in Europe. The EDF group's commitment to a robust EU greenhouse gas trading system and the Commission's ambitious long-term climate and energy strategy is recognised by all stakeholders, including NGOs such as InfluenceMap [(4)] which has repeatedly ranked EDF as one of the companies most actively promoting climate issues in EU negotiations.

The EDF group fully supports the European "Green Deal" presented by the European Commission in December 2019 and the "Climate Law" bill published in April 2020 designed to add the 2050 climate neutrality goal to European law.

In September 2020 the EDF group signed, with more than 150 businesses and investors worldwide, an open letter [(5)] calling on the President of the European Commission and the members of the European Council to increase the European Union's greenhouse gas reduction goal (set in 2014 at -40% compared to the 1990 level) to a reduction goal of at least 55%. This initiative was coordinated by the European think tank Corporate Leaders Groups (CLG Europe) of which the EDF group is a member.

In November 2020, as part of a conference [(6)] organised by IEA entitled "The Role of Low-Carbon Electricity to reach Paris Goals", Jean-Bernard Levy, Chairman & CEO of EDF, came out in favour of a carbon price of at least €50/t and even €100/t to enable the European greenhouse gas market to play its role as a price signal and trigger fundamental decisions by European electricity producers and major firms to achieve a carbon-free economy.

3.1.3.4.3 On an international level

EDF supports the Carbon Pricing Leadership Group initiative that brings together businesses, governments, academics, and NGOs to promote carbon pricing as a means of achieving a carbon-free world economy. At the Climate Action Summit organised by the Secretary General of the United Nations in September 2019, the EDF group signed the CPLC's appeal [(7)] recommending a price per tonne of carbon of $40-$80 by 2020 and $50-$100 by 2030, in line with the 2017 Stern-Stiglitz report, in order to enable countries to abide by the Paris Agreement.

In February 2020, the EDF group joined the "Business Ambition for 1.5 degrees: our only future" initiative launched by the United Nations Global Compact "We Mean Business and Science Based Target Initiative" (see section 3.1.1.1.1 "Achieving carbon neutrality by 2050").

3.1.3.4.4 Acting in a consistent manner with external stakeholders

The EDF group set up specific governance to ensure the consistency of the positions promoted by the Group. All the Group's key positions on climate issues are approved by the Public Authorities Relations Management Committee. This Committee, co-chaired by the General Secretary and the Group Senior Executive Vice-President in charge of Innovation, Corporate Social Responsibility and Strategy, meets every week and features, among others, the Public Affairs Division, the European Affairs Division, the Regulation Division, and the Legal Affairs Division. The SEVP, Executive Coordination and Governmental Relations, takes the role of Secretary.

Responses to public calls for tender and EDF group positions on climate strategy are drawn up in collaboration with the climate change anticipatory monitoring network, which brings together all of EDF group's business units and entities (including its subsidiaries). This network is part of the Group's Sustainable Development anticipatory monitoring scheme. The EDF group's responses to public calls for tender (particularly if they are organised by the European Commission) are made public. The key points of the Group's positions are released through corporate social networks (LinkedIn and Twitter).

The EDF group makes sure not to support initiatives promoting positions not in line with its own aims in terms of combating climate change. EDF ceased to be a member of Business Europe on 1 November 2020.

3.1.3.4.5 Raising awareness and providing information

In 2019, EDF launched the first International Climate & Public Opinion Monitoring Centre (see section 3.5.1 "Listening and understanding issues") [(8)]. The 2020 results demonstrate that, in spite of the coronavirus crisis, climate issues remain central to the concerns of the world's populations.

3.1.3.5 Involvement of employees and executive officers in carbon neutrality

The EDF group implements actions to enable all its employees and corporate officers to adopt the Group's *raison d'être* and climate commitments. These actions involve employee training [(9)], compensation and collective intelligence.

(1) ppe.debatpublic.fr/cahier-dacteur-ndeg43-edf
(2) The multi-year programme was published by decree on 21 April 2020.
(3) medef.com/fr/communique-de-presse/article/french-business-climate-pledge-les-entreprises-francaises-engagees-pour-le-climat
(4) influencemap.org
(5) corporateleadersgroup.com/reports-evidence-and-insights/ceos-urge-eu-to-raise-emissions-targets
(6) Iea.org/events/iea-speaker-series-with-jean-bernard-levy-chairman-and-chief-executive-officer-edf
(7) CPLC: www.carbonpricingleadership.org/news/2019/9/19/business-leaders-call-for-long-term-stable-carbon-pricing-policies
(8) edf.fr/observatoire
(9) See section 3.3.3.6.6 "Sustainable development skills development".

3.1.3.5.1 Compensation linked to combating climate change

In terms of employee compensation, the 2020 profit-sharing agreement signed by EDF's management and its social partners includes, in addition to business and health & safety criteria, one climate-based criterion. The 2020 profit-sharing reference value was maintained at the same level as in the previous agreement, *i.e.* €2,150 for the average salary with 100% of criteria met. The climate-based criterion features a goal of 60% of EDF SA employees having achieved at least the "environmentally-aware" level of the "carbon neutrality passport" that they were advised to apply for by the end of 2020 (see section 3.1.3.5.2 "Innovation and collective intelligence"). Further negotiations will begin in 2021 to draw up the 2021-2023 three-yearly profit-sharing agreement.

In terms of compensation of corporate officers, a new climate-based criterion was added in 2020 to the calculation of bonuses paid to EDF SA corporate officers. The climate-based criterion taken into account is the carbon intensity [(1)] of the Group's electricity and heat production. This covers the direct CO_2 emissions of production plants in relation to the number of kWh of electricity or heat produce. Carbon intensity was 82gCO_2/kWh in 2017 and the target was set at 35gCO_2/kWh in 2030. In 2020, carbon intensity was 51gCO_2/kWh, *i.e.* 66% goal achievement, in line with the trajectory. This new criterion can account for up to 10% of bonuses paid to EDF SA corporate officers. This criterion accordingly backs up the CSR criterion on occupational health and safety, based on the global LTIR (employees and providers), and which can account for up to 5% of bonuses paid to Group executive officers [(2)].

3.1.3.5.2 Innovation and collective intelligence

EDF deploys its own initiatives to develop collective intelligence. Several of them are directly focused on combating global warming.

The "Combating CO_2, it starts with us!" programme and the "carbon neutrality passport"

The "Combating CO_2, it starts with us!" programme, which encourages all Group employees in France to better manage their energy use and reduce their personal carbon footprint, was backed up with a "carbon neutrality passport" to test their knowledge on climate change and man-made emissions, assess their carbon footprint, and take action based on challenges in the fields of energy use, housing, power supply, and digital technology. The award of this passport is one of the criteria of the profit-sharing agreement signed for 2020 (see section 3.1.3.5.1 "Compensation linked to combating climate change").

"Climate Collage"

In addition to business-specific training and awareness campaigns on environmental issues, the EDF group committed to training its 165,000 employees by the end of 2022 on climate issues through the "Climate Collage", a collective intelligence-based tool that makes it easy to understand the key conclusions of the Intergovernmental Panel on Climate Change (IPCC) report [(3)] and particularly causal links to climate change. The deployment of this operation is supervised by the Group Executive Committee's Climate point person. To date, more than 330 sessions have been held, attended by more than 3,200 employees from 20 divisions worldwide. To deploy the "Climate Collage" group-wide, 170 employees signed up to act as instructors.

"Employer sustainable mobility plans" developed by employees

Through the France-wide EDF group agreement on sustainable mobility unanimously signed in November 2019, a commitment was made to develop an "Employer sustainable mobility plan" for sites with more than 100 employees, *i.e.* 136 sites to date. Accordingly, it was recommended that the entities in question involve employees in producing and implementing these employer mobility plans through a preliminary survey, collaborative workshops to work on appropriate actions and organisations and team workshops to adopt the mobility plan drawn up for the site. Furthermore, employees are offered solutions to develop their sustainable mobility: flat sustainable mobility rate for car-sharers, negotiated discounts to purchase electric vehicles and charging stations, bikes or cycling equipment, e-learning to provide employees with bicycle safety training.

3.1.4 Development of uses of electricity and energy services

The development of uses of electricity is a key tool to achieve a carbon-free economy, provided that the electricity is mainly carbon-free. EDF contributes to this goal through solutions tailored to different markets (residential customers, businesses, and local authorities) and also develops different innovative cross-disciplinary solutions. The digital revolution opens up new prospects in this area, offering customers the possibility of being more actively involved in their use and indeed the production of energy, controlling their energy use, and limiting their CO_2 emissions. The increasing use of electricity fosters the development of new, more effective solutions, most notably smart meters allowing more accurate and detailed analysis of use. This movement should be ramped up to keep pace with technological and regulatory changes, such as the future "RE2020" environmental regulation covering the environmental performance of new buildings from summer 2021, with the aim of reducing the carbon impact of buildings and continuing to improve their energy performance.

3.1.4.1 Residential energy services

The EDF group supplies energy to over 30 million residential customers, most of them in France, the UK, Belgium, and Italy. EDF develops innovative digital solutions for these customers, helping them manage their energy use and supporting them in their energy savings projects.

3.1.4.1.1 Monitoring and understanding energy use

In France [(4)], EDF provides everyday energy use monitoring tools, through internet or smartphone "*Mes Écos & Moi*" (*i.e.* My energy uses and me). These solutions enable customers equipped with a Linky [(5)] smart meter and who have given their consent, to monitor their energy use in kWh and €, identify the main items of electrical and/or gas expenditure, compare their energy use to similar households and obtain custom advice to make energy savings. For example, customers can set an annual energy use target, associated with e-mail or SMS alerts in case of deviations. Customers who check this energy use tracking tool more than two or three times a month achieve savings of up to 12% on their bills.

They can also access a dedicated newsfeed "*Fil d'actu*" in the "*EDF&Moi*" (*i.e.* EDF & Me) app, where they can access daily information to understand their energy use and make savings (weather impact, similar households, proportion of heating, appropriate environmentally-friendly actions, etc.).

In the same spirit, in Italy, Edison continued developing its "Edison World" platform to make it more easily accessible. The Energy Control service is available online on Edison's website, and helps customers understand their energy use pattern better and advises them on reducing related costs, based on actual data for a sober and appropriate use.

Sowee, a subsidiary of EDF in France, markets its connected station, compatible with gas-fired boilers and individual electric heating, which allows better control over their energy budget and comfort. Customers who use the station can achieve energy savings of up to 25% without changing their installation [(6)].

(1) See section 3.1.1.1.2 "2030 goals recognised by the SBTi".

(2) Including EDF SA, Edison, EDF in the UK and Luminus.

(3) This tool developed in 2015 by Cédric Ringenbach has already been used to train more than 100,000 employees worldwide.

(4) The e.quilibre solution was deployed in the French islands in 2018.

(5) Led by Enedis.

(6) EDF R&D internal study: savings estimated on the basis of dynamic heat models, using a home permanently heated to 20°C, not fitted with a central heating timer or open window detector, and without real-time energy use tracking, as a baseline. Depending on where the home is located and lifestyle habits, the connected station can help achieve energy savings of up to 25% for residential electric heating and up to 20% for residential gas heating.

3.1.4.1.2 Achieving energy savings

EDF offers to its French customers energy performance diagnoses, advice on heating systems, and installation of high-performance equipment.

Online diagnosis and advice

In addition to digital energy use monitoring solutions, EDF offers a range of services:

- assisting customers seeking eco-friendly household appliances by means of attractive marketing campaigns, in partnership with Samsung;
- simulators to estimate home energy labels, assess the cost of renovation works, and identify any potential financial aid available;
- putting customers seeking to carry out energy savings works such as renovation, insulation, or changing their type of heating in touch with trusted professionals, offering them the benefit of financial bonuses to help pay for the works in question if they qualify for these (accessible through the prime-energie-edf.fr website). Preferential financial terms for works are also offered by EDF's financial partner, Domofinance.

Promoting low-carbon practices

The "*Mon Chauffage Durable*" (*i.e.* "My sustainable heating") solution allows customers to replace a fossil fuel-fired boiler with a heat pump, or convector radiators with eco-friendly radiators. This solution is part of the "*Coup de Pouce Chauffage*" (*i.e.* Heating boost) initiative launched by the French government in January 2019. For heat pumps, EDF goes further than the state scheme, and offers additional bonuses. Homes can also benefit from preferential rate financing provided through EDF, covering the entire cost of their project [(1)]. EDF has also innovated with new supply solutions for residential customers keen to be part involved in the energy transition, with its "*Vert Électrique*" range and its "*Avantage Gaz Durable*" solution. The EDF Renewables [(2)] subsidiary markets the "*Mon Soleil & Moi*" (*i.e.* "My sun and me") self-produced energy solution, increasing household self-produced energy rates and covering a greater share of their energy bills (see section 1.4.2.2.1.1 "Residential customers").

IZI by EDF established itself in 2020 as a major energy renovation and electric mobility specialist, particularly following the acquisition and integration of the company mychauffage.com, a leading online heating solutions sales platform. Accordingly, new turnkey solutions (heat pumps, insulation, windows, ventilation, electric mobility) integrating equipment, installation and deduction of subsidies, were developed in 2020 by IZI by EDF in conjunction with EDF's other subsidiaries (see section 1.4.6.1.4 "Other EDF group service activities").

3.1.4.2 Energy services for businesses and local authorities

3.1.4.2.1 Businesses

The EDF group offers customised services to companies and professionals that wish to optimise their energy flows to improve their economic performance and reduce their environmental footprint. Services provided by EDF and its subsidiaries to make the best use of energy include energy audits, monitoring and management of energy use (also using digital platforms), energy savings investments, calculating the profitability of these investments, etc. EDF commitments in this respect take the form of specific performance plans and energy productivity plans. EDF can assure optimisation of all the flows – electricity, gas, water, steam – of a company and handles the complete energy management of industrial sites. EDF provides certified "green" renewable electricity supply to companies, who so wish. EDF can also help a company choose the solution that is most suitable to its own energy generation (heat pump, photovoltaic panel, solar hot water, small wind turbine) and set it up.

In France, EDF offers a personalised supply contract, specially adapted to the additional power requirements of individual self-produced energy customers. The solution provides customers with more accurate forecasts of their electricity budget and use. They can choose peak and off-peak hours synchronised with their solar production, enabling them to maximise and organise their savings. They also have the option of certifying the renewable origin of electricity supplied by EDF.

In 2020 Dalkia deployed its "Dalkia Analytics powered by METRON" solution for industrial customers. This solution features both Dalkia's energy efficiency expertise and METRON's cutting-edge smart energy technology, combining big data and artificial intelligence. This allows industrial customers to continuously optimise the energy performance of their facilities and save up to 15% on their energy bills. Dalkia also signed up to an innovative partnership with SNCF Gares & Connexion and the Lille-based start-up Stereographe to create a digital twin of its 3,000 stations to optimise the energy use of buildings (BIM: Building Information Modelling).

The Downstream/Upstream Optimisation & Trading Division [(3)] developed "Trackelec", an innovative blockchain-based traceability and certification solution. To confirm green energy purchases and their commitment to the energy transition, customers can access their custom web space to view the hour-by-hour matching of their business' energy use with a specific facility's renewable production. In addition to monthly management of guarantees of origin, the tool generates hourly generation/use matching certificates. Everything is recorded and certified using a blockchain. "Trackelec" has currently been rolled out on an experimental basis.

3.1.4.2.2 Local authorities

The EDF group is strongly committed to the energy transition in towns, cities and regions, which are key stakeholders in combating climate change, through a specific approach that combines local knowledge with an original marriage of the Group's innovative R&D solutions and the know-how of its business lines and subsidiaries.

To prepare for the Olympic Games in Paris in 2024, Dalkia is developing a high-performance heat production solution for the Olympic aquatic centre. The EDF Renewables subsidiary will also be setting up a solar farm on the roof of the swimming pool to produce a significant proportion of the site's electricity supply. There are plans for 90% of the energy used in the building to be renewable or recovered. In the Olympic and Paralympic village, EDF will deploy a high-performance energy system, particularly including static electric storage based on EDF technology and a photovoltaic (PV) system to increase the share of self-produced energy. Another initiative worth mentioning is EDF's support for the "*Campus de l'espace*" (*i.e.* Space campus) in Vernon, using very high-performance photovoltaic modules, energy optimisation solutions, IT heat recovery systems and electric vehicle charging stations.

The implementation of the project to modernise street lighting systems on major roads in Belgium's Walloon region, won in 2019 by the Luwa consortium featuring, among others, Citelum and Luminus, has made good progress: 50,000 lampposts have been audited, 20,000 lights modernised, and light intensity has been adjusted according to traffic density and reproduction periods in "Natura 2000" zones.

Edison, with support from R&D, developed a digital model of 11km^2 of the historic city centre of Turin, to provide the authorities with simulations of the impact on the energy transition of different potential development actions. These works were shared widely.

(1) Subject to using one of EDF's 3,000 Energy Savings Partners and to examination and acceptance by EDF's financial partners Domofinance.

(2) EDF Énergies Nouvelles Réparties.

(3) The mission of the Upstream/Downstream Optimisation & Trading Division is to guarantee a physical balance between electrical supply and demand, at the lowest possible cost and risk, covering EDF's scope in France.

3.1.4.3 Electrification of uses and innovative solutions

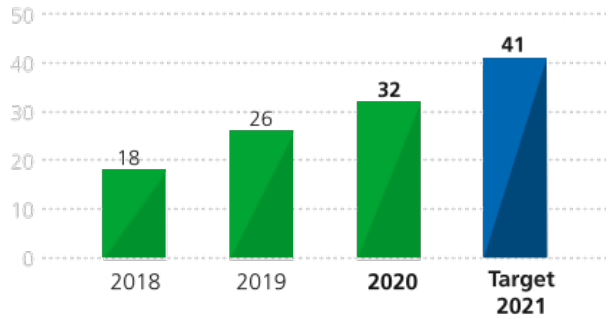
3.1.4.3.1 A network working to develop new uses

The energy transition and digital revolution have profoundly transformed the management of the electricity distribution network.

Thanks to renewal programmes, scheduled renovation and use of underground lines in high-risk climate zones, the frequency of power outages has been down for several years, causing a reduction in the average outage time per customer. In 2020, the indicator saw a number of climate crisis situations below the average of the three previous years (SAIDI: 52 min in 2020 compared to 79 min in 2019, CAIDI: 76 min in 2020 compared to 115 min in 2019 and SAIFI: 0.68 min in 2019 compared to 0.69 min in 2019) [1].

In terms of "smart grid" technology, the HV network (20kV) is already smart since it is supervised, equipped with automated re-supplying and various smart solutions tailored to the external environment (water sensors in stations located in flooding zones, "verticality" sensors for isolated posts in mountainous areas, HV/LV transformer with automatic voltage adjustment in areas where renewable energy is already in heavy use, etc.). For the LV network, the deployment of smart meters now enables us to have a real-time vision of the characteristics of the electricity at the individual customer level (alarm in case of outage, voltage level). At the end of December 2020, in France, 80% of customers were equipped with smart meters, and 80% of energy was transmitted through "smart" networks. These advanced meters are a key link of smart networks. They provide all stakeholders – distributors, suppliers, customers and local authorities – with a wide range of benefits. The EDF group has set itself the goal of installing at least 41 million such meters by 2021, mainly in France (where the roll-out is mainly managed by Enedis), the UK, and India. At the end of 2020, over 32 million meters had been installed by the EDF group.

Number of smart meters installed (millions)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

2020 was marked by the publication in March, by the distribution network manager, Enedis, of its roadmap for the transformation of network scaling methods and integration of flexibilities. This particularly identifies high-priority projects and upcoming transformations to contribute to making Enedis the leading distributor in France and Europe.

In October 2020, Enedis signed its first 2 flexibility contracts, anticipating the transposition into French law of the 2019 energy market Directive known as the "Clean Energy Package", and became one of the very first distribution network managers to sign this kind of contract.

Based on its artificial intelligence and big data work, Enedis is studying new methods to optimise the renewal of its under- and overground cable/line, low- and medium-voltage facilities, by combining asset data (mapping) and incident histories.

France's first dual heat and electricity smart grid was commissioned in summer 2020 in the "Nanterre Coeur Université" ecodistrict. In partnership with UrbanEra and Bouygues Immobilier, Dalkia Smart Building designed and built this smart network connecting different buildings (offices, housing, businesses), pooling occupants' needs, and enabling buildings to exchange their calories. Based on this energy solidarity and an innovative energy mix combining geothermal, aerothermal, biomass and free heat recovery, it supplies heat, hot water and air-conditioning using 60% renewable energy. The electricity necessary for its own functioning is produced through self-produced energy photovoltaics and cogeneration. Finally, digital network management enables real-time adjustment of energy production to match energy use.

3.1.4.3.2 Carbon-free electricity at an affordable price

One of EDF's goals is to supply sustainable electricity at a reasonable price. Energy becomes affordable when a balance with the other fundamental goals of any business is achieved. Based on its strong public service values, EDF considers that electricity, as an essential asset, must be accessible to all and in all areas.

In 2020, the average sale price (excl. VAT) of electricity at the Regulated Rate for EDF residential customers was €125.7/MWh and for non-residential customers [2] was €125.3. On average, every month, a residential customer who signed a "6KVA Base" contract (monthly use of 200kWh) spends €28 excl. VAT (€41.80 incl. VAT) on their electricity bill. A residential customer, with a "9kVA peak/off-peak" contract (monthly use of 600kWh), spends €71.40 excl. VAT (€109.80 incl. VAT) on their electricity.

3.1.4.3.3. Reducing carbon impact using electric mobility solutions

The Electric Mobility Plan

With the electric mobility plan, launched in October 2018, EDF is aiming for a 30% market share in the supply of electricity to electric vehicles in 2023 in the Group's four major markets (France, the United Kingdom, Italy and Belgium), the deployment of 150,000 charging points and the operation of 10,000 smart charging points by 2023.

The acquisition in February 2020 of UK-based Pod Point [3], one of the largest electric vehicle charging companies in the UK, will help to achieve these goals.

At the end of 2020, more than 100,000 charging points had been deployed or were operated worldwide (G4, California, Norway) by the EDF group (IZIVIA, Rod Point, IZI by EDF, Luminus, Edison, Powerflex). More than 5,000 are operated using smart charging technologies (IZIVIA, Powerflex, Dreev).

Development of recharging infrastructure

Faced with a challenging year, EDF UK and Pod Point actively contributed to the deployment of charging stations with the installation of more than 35,000 charging points.

Izivia, a French market leader, is one of the leading network operators, with over 10,000 public and private charging points operated in 2020. To make travel across Europe easier, Izivia also provides customers holding an IZIVIA Pass with access to 100,000 charging stations through interoperability. IZIVIA currently has two major projects bolstering fast charging services in urban and suburban environments, optimised for current uses:

- the deployment of a network of approximately 60 stations for 300 fast charging station (from 50 to 100kW) on potential high-traffic sites near major motorways on the edge of large towns and cities;
- the ongoing deployment in 59 towns around Lyon of an interoperable network of 170 stations featuring 641 charging points. IZIVIA also launched a service to install charging stations in condominiums in January 2020.

(1) SAIDI: System Average Interruption Duration Index; CAIDI: Customer Average Interruption Duration Index; SAIFI: System Average Interruption Frequency Index.
(2) Business market customers at Regulated Sales Rates with LV connection ≤ 36kVA.
(3) See EDF group press release of 14 February 2020.

Development of smart charging

In the field of smart charging and more specifically Vehicle-to-Grid (V2G), EDF, the Occitanie region, ADDOC and ADEME (*i.e.* the French Environmental & Energy Management Agency) launched the "Flexitanie" project with the aim of carrying out large-scale testing of a V2G two-way charging station management service in autumn 2020 with the specific aim of understanding customer expectations and perceptions and analysing potential synergies with renewable energy production. The first charging stations will be installed in the Gard region by IZIVIA, using technology developed by DREEV, a joint venture set up by EDF and the Californian start-up Nuvve. They will be able to supply a fleet of one hundred 100%-electric Nissan electric vehicles owned by a dozen industrial customers across the region and will supply the equivalent of a 1MW production plant.

The September 2019 acquisition of PowerFlex Systems (PowerFlex), a pioneering company in the field of electric vehicle charging technologies, based in Los Altos in California, enables the creation of a unique decentralised energy ecosystem combining smart charging solutions for electric vehicles or building energy charging solutions, as well as solar energy production and storage systems.

Assisting customers

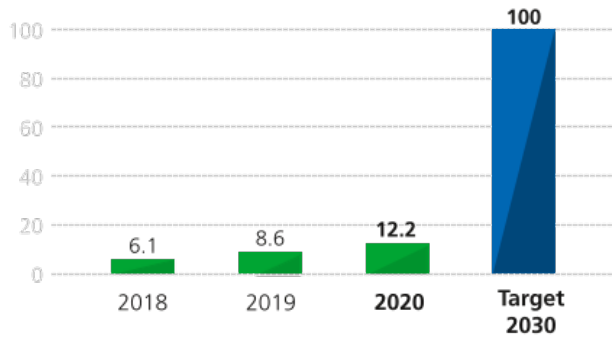
The EDF group is assisting all its customers in France with their transition to low-carbon mobility by providing a comprehensive range of solutions for all uses: residential customers living in detached homes or apartments, and local authorities.

EDF believes that the development of electric mobility will require mobilisation of the ecosystem. A number of partnerships have been developed with stakeholders in the sector (manufacturers, equipment manufacturers, leasers, leasing companies, charging station manufacturers) to propose custom electric mobility solutions. In early 2020, Edison Energia signed a contract with Toyota Italia to install and operate charging stations in approximately 200 Toyota dealerships. In March 2020, EDF committed with ARVAL to facilitating access to electric mobility for both business and residential customers, based on IZI by EDF. In September 2020, IZIVIA and IZI by EDF signed a partnership agreement with Uber to facilitate access to charging stations for drivers across France through the IZIVIA pass and the installation of home charging stations. In December 2020, BMW and Luminus signed a strategic partnership agreement enabling BMW customers to take out a green energy or photovoltaic installation contract including a charging station installed by Luminus.

EDF's commitment for its vehicle fleet

The EDF group is the first French group to sign the "EV100", which aims at having a fleet of 100% electric light vehicles by 2030. Of its fleet of light vehicles, which currently includes more than 45,000 vehicles worldwide (mainly in Europe), more than 12.2% (over 5,500 electric vehicles, 1,700 more vehicles since end 2019) is already electric. This Group project includes both the vehicles and charging infrastructure divisions (more than 2,400 sites to be equipped across the world by 2030).

Electric vehicles rate in the fleet of light vehicles (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.1.4.3.4 Reducing carbon impact using hydrogen solutions

In 2050, hydrogen will account for 20% of worldwide final energy demand [(1)]. But 95% of hydrogen is currently produced from fossil energy, meaning it emits high levels of CO_2. In 2019, EDF decided to set up Hynamics, a new fully-owned subsidiary, with the aim of becoming a leading producer of carbon-free hydrogen through electrolysis of water, as this technology emits very little CO_2, provided that the electricity used is itself produced using a low-carbon system.

Hynamics aims to achieve the goal of achieving a carbon-free economy by targeting segments of industry and transport that emit large quantities of CO_2 and are hard to serve with low-carbon electricity (refineries, chemical and cement production facilities, buses, trains, sea and river shuttles, aeronautics, etc.). Based on its investor and operator/maintainer model, it offers turnkey solutions to its customers in France and more generally in Europe.

In August 2020, the JV Westküste100, in which Hynamics is a 24% shareholder, was awarded €15 million in aid to install a 30MW electrolyser, one of Europe's biggest, on the Heide refinery site in Schleswig Holstein as part of the German Reallabor programme. Hynamics also successfully bid on mobility-related ADEME (French Environmental & Energy Management Agency) calls for projects to supply energy for buses, respectively in Montpellier and Auxerre [(2)].

At the end of 2020, Hynamics announced the signing by its project company CP3 of a partnership agreement with the Auxerre municipal authorities and Transdev Auxerrois to install a 1MW-capacity electrolysis-based green hydrogen production plant (commissioning scheduled for autumn 2012) to supply energy for 5 urban transport network buses.

3.1.4.3.5 Reducing carbon impact using self-produced energy solutions

On this growing market, several Group subsidiaries can propose solutions to their business or residential customers.

- the EDF Renewables subsidiary enables customers to use the energy generated by their own solar panels and store some of it for use when needed. The solution enables customers to maximise their self-produced energy rate, monitor their energy use online in real time, meaning they can control their energy spending (see section 1.4.1.3.3 "Activities of EDF Renewables");
- EDF Store & Forecast, develops and markets a software solution for energy optimisation of local electricity systems through energy forecasting and storage. EDF adapts its Energy Management System to its customers' facilities for smart and independent management including the management of the variability of renewable energies, services to the electricity system, economic optimisation of the demand/supply balance, maximisation of self-produced energy and reduction of energy bills.

3.1.4.3.6 Management of intermittence, flexibility and storage development

Aggregation

Agregio is a subsidiary of the Group which serves electricity producers with renewable generation capacities, and companies with load-shedding capacities, which they can promote in the electricity markets in the best possible manner. For electricity producers, Agregio offers tailored solutions to optimise and sell their production on the markets. Agregio is also aimed at industrial and tertiary consumers, who are willing to reduce or shift their use in exchange for compensation, according to the needs of the electricity system.

In 2019, Agregio signed, for the first time in France, a Power Purchase Agreement (PPA) [(3)] based on a wind farm. The PPA technique, which is widespread in the United States, is starting to be rolled out in Europe: this solution can favour the development of renewable energy by enabling producers to guarantee their income over several years, and customers to know the origin of part of their supply.

(1) See the 2018 Afhypac report.

(2) See EDF group press release of 17 December 2020.

(3) A PPA is a long-term electricity delivery agreement between two parties (the energy producer and the end user purchaser, or market stakeholder) with price visibility covering the entire term of the contract.

Storage

In a changing energy environment, EDF launched its Electric Storage Plan in 2018 to accelerate its development in this sector with the aim of becoming the European leader in this area. A pioneer in the field, the Group is already present in the main areas of application of storage technologies, in particular batteries and Pumped Energy Transfer Stations (hydraulic ETS).

EDF aims to develop 10GW of new storage facilities across the world by 2035 in addition to the 5GW already operated by the Group. EDF's goals cover all electricity storage markets in order to ensure the proper functioning of the balance between the electricity system, private and business customers and regions. The microgrids (isolated grid supply) and off-grid (no grid access) market segments also contribute to the Group's storage aim. EDF is also aiming to develop a portfolio of 1 million off-grid kits by 2030. EDF has therefore invested in a number of off-grid electrification companies, particularly in the Ivory Coast, Ghana, Kenya, and Togo. The Group's off-grid customer portfolio is growing regularly (also see section 1.4.5.3.9 "Off-grid energy").

The Group's storage project portfolio is growing dynamically. The current combined capacity of projects built or secured is 800MW. The main aim of the projects developed is to offer services that support the electricity system and mesh with renewable energy production to defer renewable energy dispatch onto the grid. R&D work is underway to facilitate the development of the Group's projects. R&D, for instance, aims to contribute by qualifying equipment and making facilities easier to operate.

3.2 Preserving the planet's resources

EDF is committed to limiting its environmental footprint throughout the life cycle of its facilities and activities by optimising the use of natural resources. The four main CSR commitments identified in this set of issues concern biodiversity, responsible land management, integrated and sustainable water management, the circular economy and waste management.

PRESERVING THE PLANET'S RESOURCES

CSR COMMITMENTS	CONTRIBUTION TO THE UN SD GOALS	KEY PERFORMANCE INDICATORS
BIODIVERSITY	14 VIE AQUATIQUE, 15 VIE TERRESTRE	Achievement rate of Group commitments under the "Act4nature international" initiative
RESPONSIBLE LAND MANAGEMENT	15 VIE TERRESTRE	Qualitative evaluation
INTEGRATED AND SUSTAINABLE WATER MANAGEMENT	6 EAU PROPRE ET ASSAINISSEMENT, 9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE, 14 VIE AQUATIQUE	Water intensity: water consumed / electricity generated by fleet
WASTE AND CIRCULAR ECONOMY	9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE, 15 VIE TERRESTRE	France: volume of long-lived high and intermediate level solid radioactive waste UK: volume of low level radioactive solid waste generated

3.2.1 Biodiversity

3.2.1.1 EDF group's commitment

Carbon neutrality issues are inextricably intertwined with EDF's long-standing commitment to biodiversity [1]. In 2020, the Group is renewing its commitment through two state-supported voluntary schemes: "Entreprises engagées pour la nature - act4nature France" (Companies committed to nature - act4nature France) [2], under the aegis of the French Biodiversity Office; "Act4nature International" [3], under the aegis of the association "Entreprises pour l'environnement" (Epe) (Companies for the Environment).

The EDF group's commitment is structured along the following lines:

- reducing its activities' contribution to major pressure factors (as identified by IPBES [4]);
- recreating spaces and conditions that promote biodiversity;
- improving and sharing knowledge;
- strengthening the governance of biodiversity issues and raising employee awareness.

In 2020, EDF is introducing a new key performance indicator for biodiversity. This indicator reflects the Group's "Act4nature international" commitments. The objectives are certified in the "Act4nature international" external system. The indicator is calculated as a rate of fulfilment of actions undertaken from 2020 to 2022 aimed in particular at reducing the Group' activities' contribution to major pressure factors and strengthening the governance of biodiversity issues.

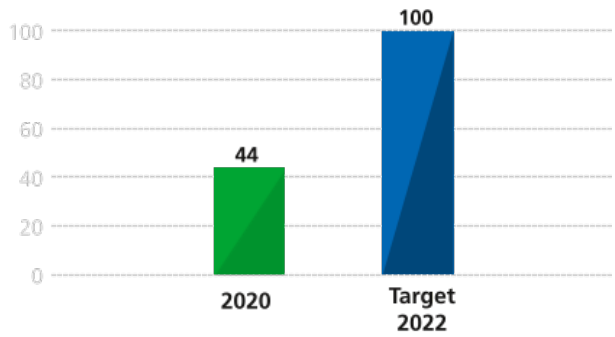
(1) EDF established a Group-wide biodiversity policy back in 2006.

(2) "*Entreprises engagées pour la nature-act4nature France*" (Companies committed to nature-act4nature France) aims to encourage the emergence, recognition and promotion of action plans in favour of biodiversity led by French companies.

(3) "Act4nature International" is an initiative launched by the French association of Enterprises for the Environment (EpE) which aims to mobilise companies on an international scale to address the issue of how they directly and indirectly impact the environment, how they rely on the environment and how they can help nature.

(4) IPBES is the Intergovernmental Science and Policy Platform on Biodiversity and Ecosystem Services.

Achievement rate of commitments under the "Act4nature international" initiative (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.2.1.2 Reducing the activities' contribution to major pressure factors

Pressures on biodiversity are closely monitored. Most of these pressures are strictly regulated. The IPBES report in 2019 identifies five major pressure factors: change of land and sea use, overexploitation of resources, climate change, pollution and invasive alien species. EDF has developed its action programme to limit its impact on each of these factors.

3.2.1.2.1 Change of land and sea use

All segments included: Avoid, Reduce and Compensate

The Group applies the principles of the mitigation hierarchy [(1)] or the regulations of the country where it is located, if these are more stringent (particularly in Europe). The Group companies apply the mitigation hierarchy (Avoid, Reduce, Compensate) doctrine for all projects and facilities in operation. The French biodiversity law of 2016 requires companies to implement "offsetting measures designed to avoid a net loss, and, preferably, even make a net gain in biodiversity".

Issues related to biodiversity are integrated throughout the engineering and operational process, from the design phase of projects to promoting prevention and reduction:

- **projects**: For new projects, the Group is optimising its site coverage and, in case of decommissioning of its facilities, works to restore the natural environment. Regarding investment decisions, 100% of the projects presented to the CECEG [(2)] are screened for risks related to biodiversity;
- **structures currently in operation**: the same vigilance is applied to structures currently in operation, in particular nuclear sites. Their impacts on the environment and biodiversity are the subject of monitoring conducted by EDF specialised teams and public bodies such as Ifremer or IRSN. The results are published and are accessible on the website edf.fr;
- **assessment of ecological equivalence**: EDF financed with Irstea [(3)] and the Natural History Museum a PhD thesis defended in December 2017 and a post-doctorate in 2019 concerning the preparation of a method to verify the achievement of ecological equivalence. This involves measuring, using indicators, the losses related to the impacts and comparing the losses resulting from a development and potential gains resulting from the offsetting measure (see section 3.2.1.4.1 "Research and biodiversity"). EDF's R&D Division continues its investigations in this field;
- **offsetting proposal**: the Company conducted an experiment in the Isère department on the offsetting proposals with the Initiative "Biodiversité Combe-Madame" non-profit organisation and the key community players. This experiment is part of the action initiated by the Ministry of Ecology, to test the relevance and feasibility of the offsetting proposals.

Wind and Solar sector

Wind and solar power plants contribute to the fight against global warming and the protection of the environment, even if their construction and operation have an impact on biodiversity. All of the Group's renewable activities are thus part of a proactive approach aimed at limiting and controlling impacts and seeking and implementing the best technical and technological solutions to preserve the environment.

The EDF group, the "*Union internationale pour la conservation de la nature*" (UICN) (International Union for Conservation of Nature), EDP and Shell are working in partnership to develop guidelines to prioritise mitigation measures and the best available measures to reduce impacts on biodiversity from onshore and offshore wind projects and photovoltaic projects (to be published in 2021).

EDF Renewables is committed to implementing an environmental management plan in France for all its ground-mounted photovoltaic power plants with biodiversity implications. By 2020, 100% of the fleets with biodiversity implications will have this management plan in place.

Hydropower sector

Hydraulic generating facilities can affect ecological continuity in aquatic environments. In France, for the implementation of ecological continuity [(4)]:

- between 2013 and 2020, the Group, through EDF Hydro and its hydroelectric activities, has implemented more than 50 schemes to facilitate fish migration on sites presenting ecological issues (classified as "List 2" under the "Water and Aquatic Environment Act"). This involves dam crossing equipment (such as "fish ladders") and the dismantling of weirs in rivers. These operations are subsidised by the Water Agencies;
- at the Poutès site (Allier), after a long consultation process, an amendment to the concession was signed in 2018 by the Prefect of Haute-Loire department, authorising the start of reconfiguration work on the facility in 2019, work that continued in 2020. For an output equivalent to the initial project, this project offers a significant ecological advantage, which will allow access to 60% of the spawning grounds of the Allier salmon, a unique genetic branch of Atlantic salmon;
- the inauguration of the new Gavet power plant in September 2020 marks a key stage in the Romanche Valley hydroelectric reconfiguration project launched by EDF in 2010. This nearly 400 million euro project consists of replacing six old power plants and five old dams with a new dam and a new, more efficient power plant (+40%). The project integrates an important environmental and aquatic environment improvement component. Almost entirely underground, the power plant blends into the landscape and significantly improves the appearance of the valley;
- EDF took part in the smooth running of the levelling of the works in Vezins under the supervision of the French State. This is the first stage of a remarkable effort at the European level which should lead to the full restoration by 2023 of the river's natural functions, opening it up to the return of diadromous migratory fish (salmon, eels, shad, lamprey).

In Belgium, Luminus and its partners (University of Liege and Namur, Profish, EDF R&D) have launched a programme to model the behaviour of migrating fish and reduce their mortality during the passage of hydroelectric facilities. The Life4Fish programme (2017-2023) is supported by the European Commission thanks to €2 million in funding as part of the European Life Programme and with an overall budget of €5 million. In 2019, two new very low impact turbines for migrating fish were installed at the Monsin hydroelectric site, as well as a behavioural barrier (eel deterrent) at the Grands-Malades site, and a bubble barrier at the Ivoz-Ramet site. A second electric barrier was installed in 2020 on the Grands-Malades site to guide young salmon to a new crossing structure that is being completed.

(1) Principles based on Performance Standard 6 of the International Finance Corporation (a World Bank organisation) dedicated to Biodiversity Conservation and Sustainable Management of Living Natural Resources.

(2) Executive Committee's Commitments Committee (CECEG).

(3) Called today Inrae.

(4) In France, we speak of the "blue grid", implemented in particular in action 39b of the national biodiversity plan.

Nuclear and traditional thermal sector

To meet its industrial needs, EDF must have access to land without increasing soil artificialisation. This is why its land tenure strategy is driven by the overriding principle of sobriety (see section 3.2.2 "Responsible land management"). Within the framework of its approach of land sobriety [(1)], EDF is committed to monitoring the level of soil waterproofing during the conversion of former continental thermal sites in order to limit it in the long term. In 2020, a first evaluation of the waterproofed land was carried out.

Electricity grids

In the areas operated by Enedis [(2)], new HV lines were completed 98% underground and 100% underground or unobtrusively for LV. Overall, 50% of HV networks are underground and 72% of LV networks are underground or isolated twisted.

Service sector

Several EDF buildings have received "BiodiverCity®" certification, a streamlined approach for players involved in sustainable construction [(3)], such as the Grande Halle in Lyon.

3.2.1.2.2 Overexploitation of resources and biodiversity

EDF's activity is partly dependent on the availability of fresh water and EDF has long been working to reduce its water footprint (see section 3.2.3.1.2 "Optimisation of water use and reducing pressure on the environment") and its impact on resources (see section 3.2.4 "Circular economy and waste").

As far as forest resources are concerned, in 2020 EDF revised its Group-wide biomass policy, incorporating new commitments in favour of biodiversity, such as giving priority to the use of secondary biomass (residues) and tertiary biomass (waste); minimising the water footprint; ensuring that soil is not converted from carbon sinks (forest, wetlands, peat bogs) to produce biomass; avoiding direct or indirect deforestation for EDF's biomass-energy needs; and minimising the ratio of cultivated surface area to energy produced.

3.2.1.2.3 Climate change and biodiversity

Although it already has one of the lowest carbon production mixes, the EDF group is further intensifying its commitment to reduce direct CO_2 emissions by 2030 (see section 3.1. "Carbon Neutrality and the Climate"). To enable the Group to achieve carbon neutrality by 2050, EDF R&D began work in 2020 dedicated to carbon offsetting. The challenge was to favour "nature-based" solutions that promote CO_2 sequestration in natural ecosystems. The Group's initial initiatives are described in section 3.1.1.5 "Carbon offsetting solutions".

3.2.1.2.4 Pollution and biodiversity

- **Soil pollution:** the Group is committed to reducing the use of phytosanitary products (see section 3.2.2 "Responsible land management").
- **Light pollution** [(4)]: to reduce light pollution, the EDF group is mobilising its R&D to better understand the impacts of artificial lighting on wildlife. Through their scientific partnership, EDF and the National Museum of Natural History (MNHN) prepared work in 2020 to define the approach and protocols to be applied to identify the groups of species or habitats sensitive to light pollution on the sites, identify pollution, and monitor the impact of the actions implemented.
- **With regard to public lighting,** Citelum carries out all the lighting renovation and maintenance work in Copenhagen, taking into account the capital's objectives in terms of respect for biodiversity. The work, which began in 2014, was carried out with the aim of minimising light pollution in the city as much as possible for humans and animals. Special attention was paid to areas designated as "vulnerable" and nature conservation areas.

3.2.1.2.5 Invasive alien species

Invasive alien species are usually detected during surveys carried out on sites. Indeed, these species most often settle and spread during land reclamation or river development. The aim is therefore to establish local species that contribute to maintaining the balance of their ecosystem and improve the ecological features of the environment, thus making it more resilient. This issue is addressed through partnerships, for example with local authorities (river contracts), or any other form of renaturation of spaces.

EDF, which has long been a partner of the OFB's "*Végétal local*" (*i.e.* Local plants) programme, is committed to the systematic use of locally sourced wild plants in all of the Group's businesses:

- as part of the Romanche Gavet project, the temporary rights-of-way for the construction of the dam over 10 hectares have been renovated by ecological engineering techniques using local plants, with support from partners such as CBNA and Irstea;
- on the Clavaux (EDF Hydro) right-of-way on 2.6ha to stop the spread of summer lilac (Buddleja davidii) and restore the natural alluvial environments typical of the Romansh region.

The inclusion in the specifications of several projects of the requirement for vegetalisation/renaturation using plants or seeds certified as "Local plants" (or an equivalent certification) reflects the existing dynamics of this approach within all EDF's business lines.

The issue of invasive alien species arises with great force in islands and overseas. In these territories, invasive alien species are mainly responsible for the disappearance of species, many of which are native to these areas. In Corsica and overseas territories, EDF is stepping up the fight against invasive alien species on the land it controls. In 2020, all EDF IES investment files going through the Work Commitment Committee were screened, including, if necessary, requests for a diagnosis of invasive alien species and, if necessary, the fight against invasive alien species.

3.2.1.3 Recreating spaces and conditions conducive to biodiversity

3.2.1.3.1 Environmental preservation and restoration

The Company manages natural sites belonging to the land it owns in partnership with local associations. EDF resorts to positive ecological management practices such as late mowing or eco-grazing; part of the land owned is allocated to areas dedicated to the protection or reconstitution of biodiversity, through management plans, with objectives adapted to the site's challenges.

In Kembs, in the heart of the *Petite Camargue Alsacienne* national nature reserve, on an old agricultural corn monoculture plot (100ha), EDF carried out large-scale ecological rehabilitation work over a 5-year period (including one year of earthworks). restoration of a river arm over more than 7 kilometers, *i.e.* creating a new river in Alsace, and re-establishment of a set of wet and dry natural environments, which increased populations and paved the way for the return of several species of insects, amphibians, birds and mammals. The monitoring of nature and management actions, in particular for the limitation of invasive alien species, are carried out and form part of a management plan managed by the Nature Reserve of Petite Camargue. A complete ecological assessment of this renaturation operation was completed in 2020 and will be shared with the partners.

This effort concerns not only the land owned by the Company, but also the land conceded by the French State. Part of this land is subject to occupancy agreements with neighbouring owners or municipalities, and to requests for use by associations, particularly sports associations. With regard to the land under concession, the Company is committed to ensuring that the new agreements include provisions for measures to promote biodiversity, subject to the agreement of the awarding authority. A list of these provisions and the terms for incorporating them into the agreements were formulated in 2020, so that they could begin to be incorporated.

(1) See also section 3.2.2 "Responsible land management".
(2) GRI G4 EN 13 – disclosure 304-4.
(3) cibi-biodivercity.com/biodivercity/
(4) This concerns light pollution that may affect sensitive species. For light pollution associated with human health, see section 3.3.1.4 "Consumer health and safety".

The French and English nuclear sites are engaged in a programme to preserve and restore environments in partnership with local stakeholders:

- in St Alban, EDF made a commitment in 2020 with the *Conservatoire des espaces naturels* (Conservatory of Natural Areas) (CEN) of the Isère department to restore and manage the Malessard wetland (20 hectares). The 2020-2024 management plan drafted by the CEN calls for the reinforcement of wildlife inventories (beavers, amphibians, dragonflies, etc.) and the implementation of the initial actions from 2020, including the creation of ponds to accommodate amphibians, the management of invasive alien species, and eventually the implementation of eco-grazing;
- in the United Kingdom, EDF is implementing action plans to conserve and enhance biodiversity on its undeveloped land properties. Each site has a Biodiversity Action Plan with performance indicators that are reviewed annually. By the end of 2019, 89% of the indicators had been met. All results are analysed, with recommendations made when improvements or alternatives are identified. The Biodiversity Action Plan will be updated in 2021.

3.2.1.3.2 Protected areas and endangered species

In France, the Group contributes to a number of national action plans for the Bearded Vulture, the Zingel Asper and Bonelli's Eagle, and takes part in the regional variants of these plans, such as the European otter project in the Centre region, the Angelica Heterocarpa project, or the one for Odonata, which was the topic of a thesis defended in 2018.

In Europe, several EDF sites contribute to achieving the preservation objectives in the Natura 2000 areas and to implementing the Natura 2000 contracts. The Group participates in "Life+" programmes, in particular EDF Hydro for the Pyrenean Desman (2014-2019), Luminus for migratory fish, or Enedis [(1)] with "Life Gypconnect 2015-2021".

In Laos, NTPC is maintaining its policy of protecting biodiversity in the river basin in conjunction with the WMPA, the authority managing it. The EDF subsidiary is committed to having Nakai Nam Theun National Park put on the IUCN Green List of Protected Areas by the end of 2022. In 2020, the Government of Laos validated the park's candidacy for this list.

3.2.1.4 Improving and sharing knowledge

3.2.1.4.1 Research and biodiversity

For over 50 years, EDF has equipped itself with a dedicated R&D department working on the environment, in partnership with external bodies. The current biodiversity research programme has mobilised €21 million, 25 researchers and technicians, and a number of partners. Their work helps improving the Company's practices for biodiversity and contributes to scientific knowledge [(1)].

The subject of biodiversity was at the heart of the discussions at the September 2020 session of the EDF Scientific Council. Since 2009, EDF's R&D and INRAE have set up the joint HYNES team in order to collaborate on the development of ecological approaches to aquatic environments. Renewed in 2019, the themes of the HYNES team have been extended to land environments. To date, ten doctoral theses and seven post-docs have been initiated, 30 publications written and eight doctoral theses defended.

In partnership with the MNHN, INRAE and its other research partners, EDF contributes to the development of knowledge and decision support tools such as the "Biodiversity Toolbox" (BOB) and "Ecoval" (ecological equivalence evaluation). These tools will provide the necessary elements to develop the land strategy of sites and strengthen their connections with the territory.

Collecting and processing data is essential for more effective biodiversity conservation action. EDF is therefore committed to several actions in this area:

- as from the commissioning of nuclear power plants, EDF has been monitoring surface water on all its sites as part of a hydro-ecological monitoring programme validated by the ASN. Since the end of the 1990s, EDF has been conducting studies to understand the influence of water temperature on aquatic organisms in the context of climate change. In 2020, EDF produced two publications on this programme;
- in order to improve knowledge about wildlife, EDF makes available its high points (*e.g.* pylons) for the installation of biodiversity data acquisition devices (*e.g.* in 2020 for the Guiana dolphin);
- EDF Renewables is committed to conducting a data acquisition programme on the conservation status of species, environmental quality and ecosystem services in the Strait of Dover (Dunkirk offshore wind project).

3.2.1.4.2 Knowing the ecological quality of land

The vast majority of EDF production sites are located close to protected sites and remarkable natural areas (in France, 80% of hydropower sites are situated in or near a Natura 2000 site). These preserved sites, located close to waterways, bring together several factors that are conducive to biodiversity.

Mandated by the Company, UNEP – WCMC (World Conservation Monitoring Centre) carried out a vast study to assess the ecological sensitivity of places where the Group's industrial sites are located [(2)]. The Company integrates biodiversity as one decision-making criterion in its industrial choices.

In France, EDF voluntarily transmitted to the INPN [(3)]data from inventories collected between 2013 and 2017 on 20,000 hectares, *i.e.* approximately 50,000 occurrence data, in addition to the 15,000 occurrence data available under SINP (Nature and Landscape Information System) [(4)] stemming from the EDF's contribution to the French State's biodiversity data repository (Depobio). Since the Biodiversity Act of 2016, all project owners have been required to enter the raw data from their impact studies in Depobio.

3.2.1.5 Strengthening biodiversity governance and awareness

3.2.1.5.1 Biodiversity governance

Biodiversity governance, which extends to the entire EDF group, is currently being overhauled following an in-depth diagnosis conducted in 2020. EDF group is involved in local biodiversity governing bodies, such as: River Basin Committees, River Committees and Regional Biodiversity Committees in France. It is developing a policy of cooperation with the associative, scientific and institutional world, which is strongly anchored at the territorial level and has biodiversity expertise:

- **Think tanks**: EDF has regular discussions with think tanks like OREE, EPE, CILB and the working group of CDC Biodiversité for the definition of the global biodiversity score;
- **Partners:**
  - In France:
    - the Company's historic partners are given priority with major players in the sector: National Natural History Museum (MNHN), League for the Protection of Birds (LPO), Nature Reserves of France (RNF), French Committee of the International Union for Nature Conservation (UICN), Federation of National Botanical Conservation Bodies (FCBN), Federation of Natural Site Conservation Bodies (FCEN), the Society for the Study and Protection of Mammals (FCEN) and Coastal Conservation Agency. In total, EDF has forged over 100 partnerships with non-profit organisations or research organisations such as the National Institute for Scientific and Technological Research for the Environment and Agriculture (Inrae, formerly Irstea) and Ifremer (French Research Institute for Exploitation of the Sea). These partners meet regularly to maintain collective momentum in favour of EDF's biodiversity approach. In 2020, in preparation for the "*Entreprises engagées pour la nature – act4nature France*" commitment, the partners challenged the implementation of EDF's biodiversity roadmap during a two-day seminar attended by more than 70 people,

(1) In 2020, EDF produced three publications, spoke at two international conferences, and hosted three post-docs and doctoral theses.

(2) Analysis carried out in September 2018 by the WCMC for EDF, EDF Renewables, EDF in the UK, Edison, EDF China and the International Division (EDF Luminus, MECO, Nachtigal, EDF Norte Fluminense, NTPC, SLOE, and SNOP).

(3) National Inventory of Natural Heritage (INPN).

(4) SINP is the Nature and Landscape Information System set up by the French State in 2018.

- locally, numerous partnerships aim to help sites in their approach conducted in favour of biodiversity; The partnership with the National Federation of Fishing in France (FNPF) continues through the financing and management of actions in favour of aquatic environments (one framework agreement and nearly 50 local agreements with departmental federations). Numerous actions are also carried out within the nuclear fleet in partnership with local players.

› Outside France:

- in the UK, EDF is one of the five companies to have met the Wildlife Trusts' Biodiversity Benchmark. On multiple sites EDF has collaborated for more than 20 years with the Suffolk Wildlife Trust in Sizewell, the Lancashire Wildlife Trust in Heysham, the Willdfowl & Wetlands Trust at Hinkley Point C and with the Romney Marsh Countryside Partnership in Dungeness,
- in the United States, EDF Renewables is actively involved in the American Wind & Wildlife Institute, an NGO involved in understanding and minimising the impacts of wind energy on wildlife. EDF Renewables is a partner, Executive Committee member, technical advisor and participant in a research project on technologies aimed at reducing the impact on bats, eagles, large raptors, birds and endangered species. EDF Renewables is a member of the American Wind Energy Association's Wildlife and Federal Permitting Committee along with several subcommittees also working on wildlife and environmental issues.

3.2.1.5.2 Employee training and awareness raising

The EDF group is setting up an awareness and training programme for its employees to improve its business practices in light of biodiversity issues Each company manages its own internal training and awareness-raising activities, which are often carried out with the help of nature association partners. Eight business guides have been published, written in a manner which very closely addresses the biodiversity issues and challenges specific to each operational activity.

Based on a concept similar to that of the "Climate Collage" (see section 3.1.3.5.2 "Innovation and collective intelligence"), the "Biodiversity Fresco" raises awareness of the causes of biodiversity erosion. To date, 20 employees having been trained to run them.

3.2.1.5.3 Raising awareness among the general public

Beyond the nature festival [1], the Group supports philanthropic actions related to biodiversity:

- the "red list" of endangered species in France prepared by UICN French Committee and the French Natural History Museum;
- the preservation of a rainforest in Brazil, EDF Norte Fluminense is continuing its work which has been underway for ten years with the Mico Leao Dourado non-profit organisation to preserve an Atlantic rainforest: reforestation of the watershed, Leontopithecus rosali habitat (golden lion tamarin). In 2019, the Company extended its partnership to take action on agroforestry. Since the start of the project, nearly 10 hectares of forest and agroforestry systems have been reforested with the direct support of EDF;
- in China, the Franco-Chinese Month of the Environment consisting of a series of cultural, scientific and artistic events in 2020 dedicated to biodiversity;
- in 2020, the EDF Foundation supported 22 actions and projects in favour of biodiversity for 50,250 people who received awareness or training and more than 1.7 million beneficiaries.

3.2.2 Responsible land management

The Group wants to act responsibly with regard to the land it holds or uses under concession. In this context, the Group is committed to giving the utmost importance to the land sobriety and energy density of its projects [2], preventing the risks of pollution, reducing waterproofing, limiting soil artificialisation [3], and developing the value of the land in compliance with regulations (concessions).

3.2.2.1 Energy density of projects

Depending on the mode of generation, the nominal installed power of the industrial tools is more or less concentrated on a given surface. Land use intensity by type of power generation was evaluated with the following results [4]:

Intensity of land use *(m^2/MWh)*	
Nuclear	0.1
Natural gas	0.2
Coal-fired	0.2 to 5
Wind	1
Geothermal	2.5
PV Solar	10
Large scale Hydropower	10
CSP Solar	15
Biomass	500
Biofuels	230 to 500

In order to limit the impact on new land, new industrial developments are preferentially positioned on existing man-made sites. Appraisal and site restoration operations are carried out by EDF's internal engineering entities specialising in the field with the assistance of external service providers.

A mapping and zoning of land areas for industrial use is systematically carried out for centralised generation systems. Diagnostics are performed out in partnership with environmental associations in order to enhance the value of existing ecosystems. This approach was carried out, for example, in 2020 on the Saint-Alban nuclear power plant.

When it comes to new renewable energies, the plants prioritise brownfield sites and the Group's properties, starting with sites in operation. For example, the installation of photovoltaic panels on new buildings of power plants, roofs or the installation of shades with 14,402 photovoltaic modules with a capacity of 6.2MW [5] in Blayais, Cruas or Saint-Alban.

With regard to the development of ground-based photovoltaic projects involving agricultural land within the territories, EDF Renewables, the French Chambers of Agriculture and the FNSEA signed a charter of best practices on 19 January 2021, focusing on responsible and coordinated land use. Following two years of analysis and consultation, this charter reconciles land preservation, the sustainability of agricultural activity and the rational development of photovoltaic solar energy, an essential component of energy transition [6].

(1) See section 3.5.2.5.10 "Responsible communication".

(2) Power/Surface area.

(3) EDF notes that the bill "to combat climate change and strengthen resilience to its effects", as transmitted to the French National Assembly on 10 February 2021, sets a programmatic objective of halving the rate of artificialisation over the next ten years compared to the previous decade.

(4) Biodiversity Monitoring Centre, May 2018.

(5) i.e. 514t of CO_2 avoided.

(6) chambres-agriculture.fr/actualites/toutes-les-actualites/detail-de-lactualite/actualites/chambres-dagriculture-france-la-fnsea-et-edf-renouvelables-signent-une-charte-sur-le-photovoltaique/.

3.2.2.2 Soil and underground management

Pollution of soil and groundwater is one of the potential environmental impacts of the Group's industrial activities. The Group owns, or uses under concession, large land assets. The environmental policies of the Group entities aim to optimise the use of land and protect these environments against any impacts. Land use and groundwater use is monitored as part of biodiversity actions (see section 3.2.1 "Biodiversity") and groundwater monitoring (see section 3.2.3.1 "Sustainability of water use").

Preventing impacts

The prevention of impacts is based on an "in-depth defence" approach and protection methods in place at all industrial sites:

- maintaining the integrity of means of protection to provide a barrier between chemical substances and the environment;
- control of effluents management operations;
- maintaining and inspecting ultimate structures such as retention systems; ensuring that the soil surface remains free from radiological and chemical contamination at industrial sites;
- physicochemical and radiological monitoring of the quality of groundwater at the sites by means of a dense network of piezometers to check the geochemical state of the water tables and retention basins at chemical effluent storage sites;
- reinforcing safeguards measures when transporting fuel or waste;
- ensuring the availability of emergency kits in the event of spillages and carrying out the corresponding drills;
- developing operational procedures;
- and high levels of awareness among operators and service providers through suitable training.

These preventive measures are based on facilities hazard and impact studies and are enriched at the time of periodic reviews.

Optimising soil use

The action plans in place to manage situations across all of the Group's sites consist of four stages: site surveys; identification of potential pollution; soil analysis; monitoring of sources of pollution and drawing up a management plan and considering possible remediation depending on future use and regulatory requirements.

Specific action plans are under way to limit the use of phytosanitary products:

- EDF's Real Estate Department aimed to abandon all phytosanitary products by 2022 for all areas of continental industrial sites that are not sensitive to safety and security issues. Other entities no longer use these products [(1)];
- the distribution network manager, Enedis, has the goal of achieving "zero phytosanitary products" by 2021 to maintain green spaces adjoining service sites and from 2024 for industrial sites (source substations).

The action plans are varied and based on alternatives to the use of chemical herbicides (mechanical, thermal or other); vegetation management protocols for EDF Renewables and EDF R&D (differentiated management of vegetation, sheep, etc.); rules relating to companies in charge of maintaining the green spaces. These actions are accompanied by a training and awareness-raising programme.

3.2.3 Integrated and sustainable water management

As a manager and major user of water resources, the EDF group aims to work towards integrated and responsible water management. As such, the Group undertakes to:

- protect and manage water in an integrated and sustainable manner, both quantitatively and qualitatively; consequently, each energy-generating site will provide for, evaluate and report on the sustainability of its water use using an internal EDF group method (pending an internationally recognised method);
- share water within the territories in which it operates by fully taking into account the local water situation (multi-use under climate constraints).

EDF participates in several international work on water (IHA Board of Directors, Board of Directors of the Partenariat Français de l'Eau (French Water Partnership), member of the World Water Council, etc.), and is also directly involved, as UFE representative to Eurelectric, in European Commission working groups on the Water Framework Directive.

3.2.3.1 Sustainability of water use

Water reservoirs held by EDF's large dams in France enable the storage of over 7 billion cubic metres of water.

At the Group level, around 45 billion cubic metres of water are used for cooling thermal power facilities, of which 99% is reusable and returned virtually instantaneously to the natural environment. As such, EDF is a significant user, but negligible consumer, of water.

Every year, several million euros are spent on R&D in the water sector. In 2019, this led to the launch of the "Visi'Eau" project in 2019, covering different research areas from cold sources to hydrological modelling of a watershed, at a cost of €9 million over 4 years.

3.2.3.1.1 Excellent results in terms of water intensity

Most of the water withdrawal from its facilities is carried out in France (80%) and the UK (18%) in areas where there is no permanent water stress. Many nuclear and thermal facilities are established in coastal locations (and therefore do not use fresh water).

Exposure to water stress

The exposure to water stress of the Group's production resources was assessed by 4 different international tools (Blue Water Scarcity from WFN, Aqueduct [(2)] from WRI, AWARE from the WULCA project and WEI+ from the EEA). These tools do not identify freshwater withdrawals from stressed areas in France, with the exception of Aqueduct. The (Baseline Water Stress – BWS) is calculated as the ratio between annual water withdrawal and average annual water availability during the 1950-2010 period for 215 sub-basins in France.

The results of this evaluation show that:

- four nuclear power plants are located in an area of extreme water stress (BWS> 80%), but are not exposed to water-related risks because they use seawater as a cold source and therefore do not draw fresh water;
- five nuclear power plants face a medium to high risk (20%<BWS<40%), for which specific measures have been taken either at the design stage or during operation (infrastructure, water management with local stakeholders, etc.). They are therefore not faced with water scarcity risks. Therefore, the Lunax reservoir was constructed from the outset upstream of the Golfech nuclear plant to prevent a possible shortage of water from the Garonne used for cooling in periods of serious drought. In 2020, Golfech was shut down for several days during a heat wave, not due to flow issues, but rather high river temperatures (regulatory limits reached);
- three flame-thermal sites are located in a water-stressed zone for which appropriate water-saving measures have been taken with no impact on output, which is low during the summer period (in practice, drought-related prefectoral decrees are issued every year during the summer).

(1) Cyclife, Edison, Luminus, EDF Norte Fluminense, EDF Hydro; ÉS no longer uses any glyphosate-based products.

(2) WRI Aqueduct, developed by the World Resources Institute, is a mapping tool for understanding the risk associated with water resources on a global scale. Aqueduct researchers calculated 12 indicators including access to water, water stress, drought, pressure on groundwater, etc.

EDF has a hydro-meteorological centre that records local data in real time for all its power plants in order to have greater accuracy with respect to time and space in measuring water stress, which is at best a monthly average for these tools. In terms of hydropower generation, the reservoirs are located upstream from basins experiencing water stress, meaning they are regularly required to provide back-up in case of lower water levels. Every 5 years, EDF Hydro reassesses its sites' generation, taking account of changing hydrology and temperatures due to climate change. Changes in water stress is one of the criteria used to evaluate any new project presented to the investment committee (Executive Committee's Commitments Committee).

Water withdrawn

69% of the water withdrawn for cooling purposes by the Group comes from marine or estuary environments, where resource availability is not an issue. This percentage is almost 61% in France, over 99% in the United Kingdom and close to 87% in Italy.

The drop in generation due to the Covid effect, combined with numerous unit shutdowns and the closure of Fessenheim, resulted in a significant decrease in the Group's water withdrawals (-5%) compared to the previous five years, mainly concerning freshwater withdrawals (-13%). The quantity of freshwater sourced from groundwater is marginal and amounts to 2hm^3, about 0.01% of the freshwater surface. Mains water is not used for cooling systems but only for various forms of water process for a share lower tha 0.1%.

Returning water to the natural environment

Almost 99% of water withdrawn is returned to the environment.

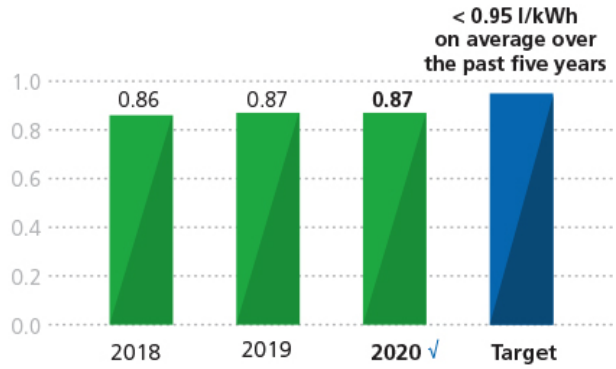
In accordance with local intake and discharge regulations, the Group's companies take the necessary measures, as part of their EMS, to comply with water quantity and quality requirements. They have implemented, in tandem with stakeholders, measures tailored to exceptional weather conditions. EDF monitors the indicator parameters for the quality of the terrestrial and aquatic ecosystems (pH, temperature, conductance, O_2, etc..) around the sites, including subterranean groundwater. The results of this monitoring are provided to the relevant local authorities and used in documents available to the public. There were no significant water-related environmental events or fines in 2020.

Water intensity

The volume of evaporated water [1] in absolute terms (435hm^3) fell sharply by 11%. As for withdrawals, this fall was mainly due to the energy mix used (fall in nuclear generation and unit shutdowns). France (96%) and the United Kingdom (2%) accounted for most of this volume. Specific consumption of evaporated water per kilowatt hour of electricity generated, also called water intensity, was stable compared to 2019 (0.87l/kWh).

2016-2020 average water intensity was 0.87l/kWh. The stated aim is to remain below the target of 0.95l/kWh on average over the five past years, by progressively reducing specific water consumption by 2030 (the benchmark being the 2015 level (0.96l/kWh)). This threshold, which is much lower than the industry average, particularly in the US [2], would serve to put an exceptional climatic year into perspective. Taking account of the expected variation in generation resources and actions taken to optimise water, total Group-wide freshwater withdrawal and consumption should fall in the coming years.

Water intensity: water consumed / electricity generated by fleet (l/kWh) √



Key non-financial performance indicator
√ 2020 indicator subject to reasonable assurance check by KPMG S.A.
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.2.3.1.2 Optimisation of water use and reducing pressure on environments

The optimisation of water used in EDF's generation activities enables to ensure management of water resources and to honouring the Group's commitment to guarantee multi-purpose water resources (drinking water, water for irrigation, tourism, etc.) and in view of the needs of local authorities. The EDF group is working on several levers to optimise its water use and reduce pressure on the environment, by reducing its water consumption, reusing and/or recycling it, and using seawater desalination processes.

Water consumption reduction and withdrawal limitation measures

In French overseas departments, R&D teams have designed dry air cooling systems for engine cooling, which reduce water withdrawal. Now, EDF PEI's power plants are no longer cooled with saltwater, and rainwater recovery tanks were installed on some plants (Guadeloupe) to reduce water withdrawals.

This year, the Golfech nuclear power plant closed a trial with a local EMS to reduce its water withdrawals from the Garonne river, as well as use of chemicals to produce demineralised water (300,000m^3/year). Thanks to the implementation of effluent reuse and seawater desalination systems, the Martigues and Blénod sites are expected to reduce water withdrawal and consumption by 2021. In Chile, following a long drought that caused the water table to fall by 1m in less than a year, specific measures were taken for the combined cycle power plant in Nueva Renca, enabling halving of process water, which plummeted from 12t/h to 6t/h. In Brazil, a plan for a second combined cycle power plant after Norte Fluminense is under consideration, featuring an air- rather than water-based cooling system from the design phase.

In order to reduce water consumption leaks from the Group's buildings, remote monitoring is carried out on 57 sites, and consumption reduction measures have been implemented (foamers on taps, automatic taps, dual-flush toilets, etc.).

(1) Of which 99.5% fresh water.

(2) Intensity ranging between 1.43 and 3.54l/kWh. see "Regional water consumption for hydro and thermal electricity generation in the United States" – Applied Energy journal – May 2017.

Water reuse and recycling

The recycling of process and cooling water is implemented throughout the Group, where appropriate:

- in order to reduce the impact on freshwater withdrawal, the possibilities of using water from WWTPs and rainwater as a source of complementary water are studied as early as the design stage of new nuclear reactors;
- the supply of part of the water from the heated cooling circuit of certain nuclear power plants for agricultural or industrial uses is authorised within the framework of specific regulatory requirements. An experiment is underway at the Golfech plant to reuse water from the secondary circuit;
- EDF's thermal power plants in Cordemais and Martigues recover rainwater or recycle their effluents so as to reduce their consumption of tap water by half. In Dalkia's large biomass combustion facilities, process wastewater is used to cool bottom ash to limit the volume of liquid effluent to be treated. The new R&D centre in Saclay uses rainwater recovery to supply 50% of toilet water of the site;
- in the UK, rainwater is recovered and reused on the Hinkley Point C construction site to eliminate site dust. At the West Burton Nuclear Power Plant (A), effluent from the wastewater treatment plant is no longer returned to the river but is now sent to the plant's basins for reuse in the cooling towers. Each year, 100,000m^3 of water is removed from the Trent River.
- in China, the Ultra-supercritical power plant of Fuzhou reuses all its process water sequentially and depending on the quality of water (from cooling to watering ash to gardens).

Desalinating sea water

EDF is carrying out several desalination trials on its sites:

- a desalination unit has been in operation since 2016 at Flamanville 3 to produce demineralised water for processes as well as for other existing reactor units;
- in Guadeloupe, the power plant in Jarry Sud has a sea water desalination facility, which has made it possible to stop using tap water and save around 50,000m^3 of fresh water per year; the same system was installed in the Port Est (Réunion) and Bellefontaine (Martinique) power plants;
- in Italy, since the end of 2016, the CCG plant in Simeri Crichi is equipped with sea water desalination systems to replace freshwater withdrawals;
- at Martigues, the pilot of a new technology, currently being tested, could be deployed to produce process water from seawater. This new technology, called AquaOmnes, consists of extracting sodium chloride salts (NaCl) from seawater using liquid resins which are heat-regenerated.

3.2.3.2 Integrated and shared water management

A new world temperature record was set in 2020 for the third consecutive year, making good water management even more important.

3.2.3.2.1 Impact of climatic conditions on electricity generation

In 2020, France's nuclear power plants suffered their biggest environment-related loss of production since 2003. At the end of 2020, cumulative generation losses due to climatic events, mainly drought, amounted to 3TWh, or 0.6% of the Group's total output, mainly due to the 80 days of shutdown of the two Chooz units (for comparison: 1.4TWh in 2019 and 2.7TWh in 2018). The same is also true for the generation of hydroelectric power plants in Belgium, which, due to lower river flows, decreased by more than 30% at the end of September (132GWh compared to 178GWh in 2019).

In Laos, the dry season led to a reduction in generation at Nam Theun 2 between July and September, three months which are generally quite rainy. Thanks to the October rains, the filling rate of the reservoir increased from 17% to 58%, but this remains a low level (the lowest since commissioning in 2010).

3.2.3.2.2 EDF met its commitments to stakeholders thanks to good management

Wherever it operates, EDF strictly manages water in a sober way on each site and is part of a water management system for each river basin.

EDF is represented by the French Electricity Union [(1)] at meetings of each of the river basin water governing authorities. EDF's actions are fully in line with the new master plans for water development and management (SDAGEs) for the 2016-2021 period. Since 2003, EDF has had an internal water coordination body, chaired by the Group Senior Executive Vice-President, Renewable Energies. The operational management of water is ensured at the national level by the Water Management Group (GGE) responsible for ensuring the regular, weekly or daily monitoring, if necessary, of water stocks in order to coordinate various production constraints and the management of the multiple uses of water. In 2020, 660hm^3 were removed from storage, to meet the various needs of water-users in the context of the specifications of hydropower concessions or agreements to share water.

EDF Hydro has been particularly vigilant in view of the drought conditions combined with the high tourist traffic on the lakes of our reservoirs. Very low flow rates on the Meuse and Moselle rivers resulted in the introduction of evaporation restrictions agreed in international conventions signed with Belgium and Luxembourg. These provisions in favour of downstream uses of frontier nuclear power plants were fully complied with, despite minor generation losses. With respect to the Garonne basin, the low-water support agreement was renewed with the provision of additional water volumes, thus increasing from 51 to 69 million cubic meters.

See also section 1.4.1.3.1.4 "Hydro generation issues" – "Managing access to water".

3.2.4 Waste and circular economy

Optimising the use of the natural resources consumed by the Group' s value chain is an essential component of the Group's corporate responsibility. In this context, the Group undertakes to:

- promote a circular economy approach;
- avoid the production of conventional waste [(2)] and promote the reuse, recycling and recovery of products/materials throughout the value chain;
- eliminate or substitute substances that pose a risk to the environment and persons with more environmentally friendly products;
- and assume its responsibilities with regard to radioactive waste.

3.2.4.1 Eco-design

The circular economy approach is integrated right from the engineering phase for new construction projects or major changes to processes. The design of facilities by engineering entities is based on an eco-design approach taking account of their environmental footprint, production management and waste recovery throughout their entire lifecycle. At each stage of the process, opportunities for eco-design are re-examined, with a view to saving resources, optimising materials and recycling over the entire life cycle of the installation.

Many mechanisms are used to implement a circular economy culture, including [(3)] :

- eco-design in the study phase: EDF Renewables studies, for example, the impacts of wind and solar power technologies has a special focus on the end-of-life of equipment and its recyclability. The wind turbines installed by EDF are 95% recyclable;

(1) *Union Française de l'Electricité* (French Electricity Union).

(2) With regard to food waste, EDF does not consider this information as being material. With respect to its materiality analysis, EDF does not consider information related to the amendments to Article L. 225-102-01 of the French Commercial Code on food shortages, respect for animal welfare and a responsible, fair and sustainable food supply as being material.

(3) Also see section 3.2.4.2.2 "Optimisation of materials".

- implementation of dedicated requirements in specifications, innovative technical solutions (water/oil separation of hydrocarbon effluents, asbestos removal, classification of industrial processes limiting waste production) or internal procedures simplifying forward thinking on construction sites;
- actions in terms of energy recovery within the industrial processes of the generating fleet. The Dampierre power station, for example, uses its hot water to supply nearby agricultural greenhouses;
- awareness-raising activities for staff and providers, for example in the form of e-learning or competitions. Therefore, a "Waste Prevention Competition" has been in place since 2011 and was extended Group-wide in 2016. It aims to detect and disseminate best practices.

3.2.4.2 Optimisation of resources

The Group's entities and companies are committed to a process of continuous improvement according to the principle that the "best waste" is waste that is not produced. They have action plans aimed at limiting the generation of waste integrated in the management systems' action programmes (EDF, Dalkia, Luminus, EDF in the UK) with associated indicators (quantity of waste prevention, savings made on waste management, quantity of equipment reused, etc.). The aim is to work on reducing the Group's internal consumption.

The mission of the "Waste and Circular Economy" Group attached to EDF's Environmental Management System (EMS) is to avoid waste production by carrying out prevention, optimisation and recycling actions.

3.2.4.2.1 Optimisation of fuels and raw materials

The Group uses raw materials for electricity generation and to provide energy services. A significant portion of these is comprised of fuels: uranium, coal, gas, fuel-oil and biomass. Electricity consumption for generation resource auxiliaries (approximately 20TWh/year) is mainly self-produced electricity [(1)].

To optimise fuels and raw materials, the Group has chosen to focus on several factors:

- variation in its generation mix: the development of renewable energies, declassification of thermal power plants, commissioning of high-efficiency combined gas cycle power plants (Edison's Maghera Levante project is targeting the European efficiency record of 63%), use of biomass by Dalkia, modernisation of the island systems' thermal fleet with liquid or solid biomass, and replacement of power plant motors in French overseas departments and territories;
- the optimisation of existing facilities: improving energy efficiency or output (IES, Dalkia, EDF in the UK) through maintenance measures, modifications, fuel quality rules and more rigorous monitoring of efficiency levels or cogeneration (e-monitoring);
- real-time selection of the most efficient means of generation: these optimisations, carried out in relation to the load curve and as a function of energy performance, are bolstered by the ISO 50001 certification of the thermal sites (Saint-Pierre and Miquelon in 2019). Dalkia uses an energy management tool to optimise energy facility fuel use and is increasing its renewable energy use rate, replacing fossil fuels;
- the implementation of a natural uranium savings strategy: EDF's control of each stage of the fuel cycle, the design of high-efficiency fuel and suitable management of that fuel within nuclear units all contribute to optimising natural uranium needs (see section 1.4.1.1.4 "The nuclear fuel cycle and related issues"). Recycling spent fuel enables savings of around 10% of natural uranium;
- the feedbacks: the Group's business model, based on managing its facilities' full lifecycle, allows for efficient feedback as well as the implementation of eco-design initiatives developed at engineering centres, such as the EPR 2 project (optimisation of water withdrawal processes and protection of fish fauna);
- supplier qualification and life cycle analyses: EDF Renewables, whose raw material use is related to equipment manufacture, asks turbine and panel manufacturers to provide life cycle analyses of their solar panels. In parallel, lifecycle assessments are carried out on wind farms to optimise raw material use;
- life cycle analyses: EDF Renewables, which uses raw materials in the manufacture of its equipment, carries out life cycle analyses of its technologies (onshore and offshore wind power, photovoltaic solar power) to identify alternatives and inform technical choices;
- industrial ecology initiatives: the Group is also developing industrial ecology initiatives among its various entities and initiatives supporting local authorities through a service based on the RECYTER tool, developed by EDF R&D, for the regional diagnosis of material and energy flows.

Consumption of different fuels fell in 2020: coal (-32%), heavy fuel oil (-6%), and gas (-12%). In France, EDF's coal consumption increased cyclically over the year 2020 as a result of the drop in carbon-free nuclear generation and calls from the grid operator for stability in the electricity system. EDF's gas consumption decreased by 12% due to lower electricity consumption.

In commercial activities, all actions in favour of energy management contribute to preserving resources. R&D is currently developing programmes to reduce the use of raw materials, such as Zinium, the Group's spin-off company which is working on zinc-air batteries. This technology uses easily accessible and non-polluting materials (for information on materials and rare earths, see also section 3.2.4.3.3 "Recycling in the field of new renewable energies").

3.2.4.2.2 Optimisation of materials

The use of recycled materials (aggregates, earth, concrete, etc.) is encouraged during major projects related to networks (ÉS, Enedis) and hydraulic, nuclear and thermal investments and the materials used are recovered.

Numerous large-scale projects resulting from the Grand Carénage programme have made a large number of equipment and spare parts available that can still be used. This is why EDF is testing in 2020 "EDF Reutiliz", a digital platform for reusing materials that has been developed to reduce the consumption of resources and limit the production of new goods. It will be deployed in 2021, thus intensifying the reuse operations already deployed on the generating fleet.

3.2.4.2.3 Optimisation of internal consumption

In a energy sobriety approach, EDF SA is aiming to reduce electricity consumption on all service sites by 2% per year between 2018 and 2021 by reducing consumption from 152.5kWh/m^2 in 2018 to 146kWh/m^2 in 2021, *i.e.* an estimated saving of 58GWh over the period. A range of measures have been put in place to achieve this ambitious goal: increased building density, major renovation work, improved building management (LED lighting, clocks, etc.), fleet renovation by abandoning old sites and leasing high-efficiency sites.

Starting with the ratio per m^2 meant fleet renovation could be taken into account to calculate the savings made and, by extrapolation, the savings generated by the floor areas freed up. Whereas in 2019 the result was in line with the objective, in result achieved in 2020 is below the target with a consumption of 149.4kWh/m^2 (-0.24%), as a consequence of the constraints linked to the health crisis in terms of air renewal in buildings. Regarding tertiary uses, a wide-ranging travel limitation programme has been implemented by many Group entities with extensive use of video-conferencing and teleworking [(2)].

(1) Net electrical generation takes account of this self-produced energy.

(2) Furthermore, Group-wide actions (videos, in-house social network posts) to raise awareness of the saving of resources (energy, water, plastic, including distribution of water bottles to employees to avoid the use of single-use plastic bottles) are regularly organised.

3.2.4.2.4 Optimisation of paper consumption

Since 2012, EDF has implemented a policy with two types of measures to reduce paper consumption:

- development of e-billing for residential customers, replacing paper bills: this development is boosted by the adoption of the French Pacte law, which allows energy suppliers to offer customers [1] e-billing by default. By the end of 2020, 50% of individual customers in France had chosen electronic invoicing, compared with 34% at the end of 2019 and 30% at the end of 2018;
- setting of an office paper purchasing reduction goal: in four years, EDF's annual printout volume was halved, falling by 60% from 400 million pages in 2015 to 158 million in 2020.

The profit-sharing agreement signed for 2020 contains a 40% reduction target for paper printing. A number of measures were implemented to encourage staff to reduce paper printing: fewer printers, removal of individual printers, default double-sided printing, generalisation of secure print with password and, finally, on some sites, targeted and encrypted campaigns are carried out. This reduction target follows three years of declining printing (-19% in 2017, -15.4% in 2018, -18% in 2019). In addition, 100% of the paper used is FSC paper (recyclable and carbon neutral) and carries the EU Ecolabel. Since 2018, the paper used by our approved suppliers in the mass publishing market (invoices and letters to Group customers as well as HR management documents sent to Group employees) is 100% recycled paper. Recycled paper is much more energy and water efficient than non-recycled paper, exceeding the obligation imposed by the Energy Transition Act [2] which requires 40% recycled paper to be used as of 1 January 2020.

3.2.4.3 Conventional waste management and recovery

So-called conventional waste includes waste passed on to a certified subsidiary during the year. Waste stored on-site, waste awaiting removal, materials reused on-site (e.g. spoil and rubble [3]) and equipment that could be reused (sold or gifted) are not taken into account. They do not include radioactive waste. Combustion fly ash and gypsum from the process are reviewed specifically [4]. Construction and decommissioning waste is included in this report, if its management falls under the responsibility of the EDF group.

3.2.4.3.1 Conventional waste

In addition to prevention measures, the Group's environmental policy aims to improve the recovery of waste that is produced by taking the following steps:

- developing the recycling of parts and materials, particularly in the decommissioning phase;
- the efficient sorting of waste so that it may be sent to energy or materials recovery companies (*e.g.*: EDF Renewables PV Cycle and First Solar agreements which take panels back at the end of their useful life, rental of IT equipment to DSP [5]);
- developing partnerships with recycling players (RECYLUM for Citelum, Veolia and Suez for conventional waste, Ateliers du Bocage for printer cartridges);
- implementing on-site pre-treatment of various waste items, in order to limit the volume of hazardous waste and promote the recovery of the remaining portion (*e.g.*: concentration of hydrocarbons).

The EDF sustainable development policy has set an objective to recover all 90% waste for the entire Group by 2021. Year-to-year changes in tonnage are strongly influenced by investments and decommissioning programmes as well as, regarding the hydropower sector, the cleaning work for dams. Waste that is collected in an ultimate waste storage centre consists of waste that does not benefit from recovery processes: sludge from flue gas processing (de-sulphurisation) or effluent processing and containing hazardous substances (the prefectural by-laws for authorisation require burial of this waste), insulation and mineral insulation (no industrial-sector solution available), and mixed waste similar to household waste. Results remain at high levels.

Group conventional waste management and recovery*	2018	2019	2020
Volume of conventional industrial waste transported for recovery *(in tonnes)*	414,627	631,367	494,103
Waste recovery rate *(%)* – EDF group	87.1	92.4	91.9
Waste recovery rate *(%)* – EDF	92.4	96.9	96.4
Waste recovery rate *(%)* – EDF in the UK	95.7	78.5	81.6

* *The methodology associated with this data is explained in section 3.7.2.3 "Further details on environmental, social and societal data from the Statement of non-financial performance".*

3.2.4.3.2 Combustion products

Resulting from the combustion of coal to generate electricity, coal ashes have properties that enable them to be used in various applications (in particular cement and concrete). In France, these ashes are classified as non-hazardous non-inert waste. Each year, EDF SA aims to exploit not only the ash produced during the year (a quantity proportional to the electricity generated from coal), but also some of the already existing ash stocks.

In 2018, EDF SA produced 128,000 t and exploited 157,500 t of coal ashes, corresponding to a 123% exploitation rate.

In 2019, the ash exploitation rate was 373%, as coal-fired power generation was historically low (31,500 t of ash produced) while ash exploitation remained at a high level (117,500 t of ash exploited).

In 2020, the health crisis had a severe negative impact on the building and public works sector in which almost all of EDF's ashes are currently used. In addition, coal-fired power generation remained at the previous year's level. Under these conditions, EDF SA produced 33,461 t and exploited 36,250 t of coal ash, corresponding to an exploitation rate of 108%.

The Group has also undertaken research into better recovery of ash, sediment and sludge and is an active participant in the work of the non-profit RECORD to develop methods and tools together with other industrial groups [6]. Tests in previous years on hydraulic generation to recover sediment for use as soil resulted in high levels of recovery in 2019. Dalkia Wastenergy is actively participating in the research project TERRACOTA for the recovery of solid recovered fuel (SRF) supported by ADEME.

(1) Customers can of course choose to opt out using the "opt out" option.
(2) Law No. 2015-992 of 17 August 2015.
(3) In the context of construction or deconstruction sites, EDF reuses the excavated soil as backfill intended for new developments.
(4) In view of the quantities produced and the outlets through which they can be exploited (mainly in the cement sector).
(5) DSP - Shared Services Division.
(6) There were many examples, including the free supply of warm water from the Gravelines power plant to the Aquanord fish farm, where by installing pipes to draw warm water from the drains, the fish farm collects 10m3 per second, without a water heating system (see the EDF "Circular economy and regions" guide, 2020).

3.2.4.3.3 Recycling in the field of new renewable energies

Recycling of wind turbines

Almost all the components of a wind turbine can be recycled, with the exception of the blades and permanent magnets. Composed essentially of concrete, steel/cast iron, copper and aluminium, the structure of a wind turbine is 90% recyclable. This figure rises to 98% if the concrete foundations are included. The hard-to-recycle components are the composite material blades. They represent about 10% of the weight of a wind turbine (2% when including the foundations). The most mature treatment solution for the moment is energy recovery. The recycling of wind turbine blades and components that are not currently recycled are the subject of various experiments and pilot projects on which EDF Renewables is working, in conjunction with EDF's R&D. These include the upgrading of fibreglass blades and transformation into aggregates for integration into concrete or wood aggregate; reuse for street furniture, playgrounds or noise barriers; pyrolysis to recover glass or carbon fibres; new technologies for easily recyclable materials for future blades.

Rare-earth [(1)] elements pose a challenge for wind power, and only for technologies using permanent magnets, *i.e.* "PMG" (Permanent Magnet Generator) wind turbines. These may contain several rare-earth elements: neodymium, dysprosium, praseodymium, or sometimes terbium in their permanent magnets. Magnets represent on average 600 to 700kg/MW in Direct Drive (mainly used offshore), and 80 to 160kg/MW in Gearbox (mainly used onshore). Not all Direct Drive wind turbines contain rare-earth elements.

Due to the low volumes, there is not yet an industrial process for recycling permanent magnets in order to reuse rare-earth elements. The recycling of permanent magnets is under study and the first projects are emerging. Manufacturers are working on creating permanent magnet wind turbines without rare-earth elements.

Recycling of photovoltaic panels

In Europe, the recycling of photovoltaic panels is governed by the European "WEEE" (Waste Electrical and Electronic Equipment) Directive Suppliers are responsible for handling their end-of-life products. More than 95% of the components are recyclable and eco-organisations ensure collection and treatment. Rare-earth elements are not used in the manufacture of photovoltaic panels.

In France, PV Cycle provides end-of-life collection (the average eco-participation in the purchase of equipment is €0.70 per panel), and the first PV recycling plant opened in Rousset in 2018, recycling "crystalline silicon" panels. The materials are separated and redirected to various industrial sectors: silicon to precious metal sectors, the aluminium frame to aluminium refineries, glass in the glass sector, junction boxes and cables are crushed and sold as copper shot, and the plastic is used as recovery fuel in cement plants.

Outside the EU, EDF's task is to contribute to the creation of recycling channels in the countries where the Group is present.

3.2.4.4 Assuming our responsibility for radioactive waste

3.2.4.4.1 Optimisation of radioactive waste

France has a strict legislative and regulatory framework that regulates the industrial management of radioactive waste and materials, stipulates any necessary add-ons and improvements, and secures financing of all these measures. The PNGMDR (French national radioactive materials and waste management plan) is a key part of this programme. Coordinated by the Ministry of Ecological Transition and the ASN (French Nuclear Safety Authority), the PNGMDR publishes guidelines on the management of radioactive materials and waste in France, and identifies any studies, actions and development work required on units or facilities. Stakeholders (including associations) are involved in this work.

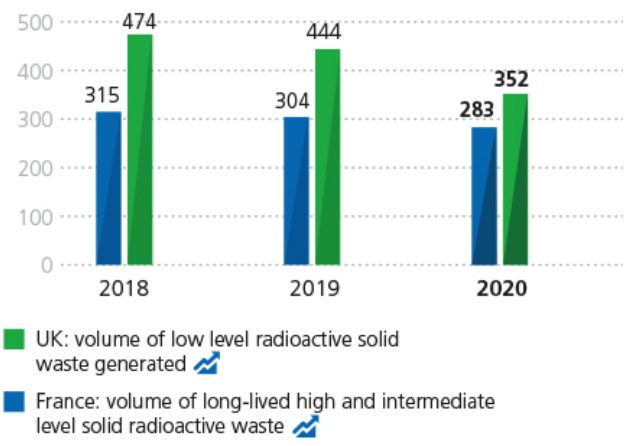
For the first time, a public debate was held in 2019 [(2)] to examine the 19-21 PNGMDR (5th edition).

3.2.4.4.2 Radioactive Waste Management

EDF, which plays an active role in managing its waste, has set up an industrial operational waste and plant dismantling management programme, which already enables secure management of all waste from nuclear electrical generation, respecting both the environment and the health of local populations and staff alike. EDF is continuing to work to improve this programme to optimise this management. In particular, EDF endeavours to reduce the quantities and harmfulness of waste produced "at the source" through waste zoning design, optimisation and adjustment, defining and optimising soil and structural decontamination operations in accordance with ASN guides, and developing and promoting good operating practices, taking advantage of the PWR reactor unit fleet effect. In addition, Centraco's fusion and incineration facilities help to further reduce stored waste volumes.

Waste from power plants in operation in France and the United Kingdom (electricity generation) is reflected here by two indicators: the volume of Low-Level solid radioactive waste disposed of (m^3) for the United Kingdom and the volume of high-level and intermediate-level long-lived solid nuclear waste (m^3) for France.

Volumes of solid radioactive waste (in m³)



Key non-financial performance indicator

The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

In France, the decrease in HA and MAVL radioactive waste production volumes is correlated with the decrease in fuel consumption over the year 2020 due to reduced electricity generation resulting from the impact of the Covid crisis. In the United Kingdom, the decline in very low level waste volumes reflects the drop in volumes shipped to approved channels due to the drop in activity also related to the health crisis.

In addition to the previous indicators, the generating plants in operation in France are concerned by very-low level solid radioactive waste and short-lived high-level and intermediate-level solid radioactive waste. The volume of very-low level waste in 2020 is 2,597m^3, compared to 3,101m^3 in 2019 and 3,289m^3 in 2018. The volume of short-lived low-level and intermediate-level waste in 2020 is 5,429m^3 compared to 5,734m^3 in 2019 and 5,827m^3 in 2018.

Within the Group's scope in the United Kingdom, the intermediate-level radioactive waste generated was 161m^3 in 2020, stable compared to 2019 and 2018.

(1) "Rare earths" are one of the categories of rare metals, a group of 17 metals whose chemical properties are necessary for the manufacture of high-tech devices. Other metals are considered "rare" or "critical" but are not "rare earths", for example cobalt or lithium.

(2) See section 1.4.1.1.2.3 "Nuclear issues" – "The nuclear fuel cycle".

3.2.4.4.3 Decommissioning and radioactive waste

Waste resulting from the decommissioning of power plants and associated industrial activities is identified in France using the indicators of very-low level solid radioactive decommissioning and industrial waste and low-level and intermediate-level radioactive waste. For the Group in France, the volume of VLL waste was 2,007m^3 in 2020, compared to 2,481m^3 in 2019 and 4,111m^3 in 2018. The volume of low-level and intermediate-level waste is 251m^3 in 2020, compared to 785m^3 in 2019 and 321m^3 in 2018.

Waste from Framatome's industrial activities in Belgium and the USA is identified by class A radioactive waste indicators. In the USA, the volume of Class A waste is 378m^3 in 2020, compared to 235m^3 in 2019 and 208m^3 in 2018. In Belgium, decommissioning activities at the Dessel site are being completed and did not produce Class A waste in 2020, whereas they represented 87m^3 in 2019 and 168m^3 in 2018. For methodological clarifications related to this data, see section 3.7.2.2 "Details on performance indicators".

Regarding metal materials with activity well below safety thresholds, EDF is in favour of the alignment of French regulations with the European regulatory framework ("release" thresholds) to authorise, after processing and checking at a dedicated facility, conventional recycling of a significant proportion of metal materials from decommissioning operations. Currently, in France, all waste from a "potential nuclear waste generation zone", irrespective of its level of activity, is considered as radioactive waste and cannot be recycled outside the nuclear industry.

3.2.4.4.4 Nuclear power and "DNSH" criteria within the framework of the European taxonomy

The work carried out in 2019 by the European Commission to establish the classification of sustainable economic activities has identified nuclear energy as a contributor to the fight against climate change: nuclear energy meets the first environmental objective of the taxonomy.

Additional expertise was requested to verify the absence of harm with respect to the other objectives (Do No Significant Harm to the Environment, DNSH). A specific study was assigned to the Commission's official research institute, the Joint Research Centre (JRC), to evaluate nuclear energy with regard to these criteria, the results of which are expected in early 2021.

At the same time, recent studies show that nuclear technology has its place in the European taxonomy:

- ARUP [(1)], a British engineering firm found that "the sector is more than compliant and in a strong position to benefit from sustainable funding";
- CEPN, a French consulting firm specialising in radiation protection which carried out a study based entirely on public documents [(2)]. This study validates the robustness of safety standards that call for a high level of environmental protection: radioactive waste management meets the environmental objectives of the DNSH. Nuclear energy meets all the objectives set by the European taxonomy. Present and future radioactive waste storage and disposal facilities guarantee sustainable nuclear power.

3.3 Well-being and solidarity

The Group's *raison d'être* is heavily based on personal well-being and solidarity development, for both its employees and all its stakeholders. The four main CSR commitments identified in this respect are the health and safety of all individuals, ethics and human rights, the promotion of equality, diversity and inclusion and the prevention of energy poverty and promotion of social innovation.

WELL-BEING AND SOLIDARITY

CSR COMMITMENTS	CONTRIBUTION TO THE UN SD GOALS	KEY PERFORMANCE INDICATORS
PROTECTING THE HEALTH AND SAFETY OF ALL	3 BONNE SANTÉ ET BIEN-ÊTRE; 12 CONSOMMATION ET PRODUCTION RESPONSABLES	Nuclear safety: Number of significant level 2 events on the INES scale
		Global LTIR (Employees and service providers)
		Number of fatal accidents connected to business-specific risks (employees and providers)
ETHICS, COMPLIANCE AND HUMAN RIGHTS	4 ÉDUCATION DE QUALITÉ	Proportion of executives who have completed the anti-corruption training programme
EQUALITY, DIVERSITY AND INCLUSION	1 PAS DE PAUVRETÉ; 5 EGALITÉ ENTRE LES SEXES	Gender balance index: percentage of women in the Management Committees of the Group's entities
		Percentage of employees who have taken part in a skills development initiative
		Rate of employees covered by a collective bargaining agreement
ENERGY POVERTY AND SOCIAL INNOVATION	1 PAS DE PAUVRETÉ; 7 ÉNERGIE PROPRE ET D'UN COÛT ABORDABLE	Number of energy support

* *For the indicator concerning social dialogue and related explanation, see section 3.5.2.4 "Social dialogue".*

3.3.1 Health and safety for all

EDF is committed to protecting the health and safety of all individuals. As part of this, the Group is committed to developing the highest standards in terms of nuclear and hydropower safety, health policies for its employees and subcontractors (reducing the number of accidents, eradicating fatal accidents, developing the management of psychosocial risks, adapting work organisation methods to ensure well-being, guaranteeing a high level of social welfare, etc.), sales offerings related to comfort and well-being, improvement of air quality and reductions in noise, visual or light pollution.

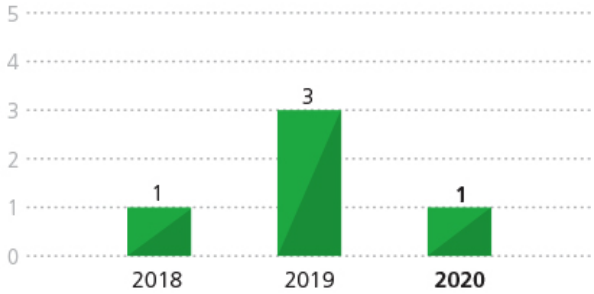
(1) www.arup.com/projects/eu-sustainable-finance-taxonomy

(2) cepn.asso.fr/publications/rapports/264-environmental-impacts-associated-with-radioactive-waste-management-a-review-of-standards-and-practices-according-to-the-do-not-significant-harm-approach-of-the-european-taxonomy.html

3.3.1.1 Nuclear safety

The operational safety of nuclear facilities is taken into consideration from the initial design stage, and is regularly monitored, together with the implementation of an employee motivation policy and large-scale investment programmes. The Group's nuclear safety policy is incorporated into training for both EDF employees and subcontractors. Nuclear safety is subject to internal controls (annual reviews, internal control plans and nuclear inspection audits in France) and external controls (peer reviews between corporate members of WANO [1] and OSART [2] audits conducted by experts from the International Atomic Energy Agency (IAEA)). In France, the safety of nuclear facilities is controlled by the ASN. In the UK, the Office for Nuclear Regulation (ONR) is the independent safety regulator in the civil nuclear sector. It monitors compliance with safety rules, including for the transport of radioactive materials. The "EDF group Nuclear Safety" policy was redefined in 2017 [3].

Nuclear safety: Number of significant level-2 events on the INES scale



Key non-financial performance indicator

The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.3.1.2 Hydropower Safety

The average age of the French hydropower fleet is 75 years [4]. Hydropower safety aims to limit risks of structural failure, risks relating to the operation of facilities during times of flooding, as well as watercourse flow variations during operation Like the nuclear safety policy, the hydropower safety policy aims for a high level of safety and continuous improvement (see section 1.4.1.3.1.3 "Hydropower safety").

3.3.1.3 Health and safety of employees and subcontractors

In an environment that is undergoing rapid, far reaching changes, the human aspect is more than ever a core component of the CAP 2030 strategic plan, itself a key factor in the Group's performance. To tackle the industrial and commercial challenges it faces, EDF must remain a socially responsible and committed employer and a benchmark in terms of health.

3.3.1.3.1 Health and safety policy

The Group's Health and Safety policy was adopted in April 2018 and is based on an undertaking signed by the Chairman and all members of the Executive Committee. It defines a common, consistent framework and all policies and action plans of the Group's different subsidiaries must comply with the policy. This Group policy applies to all the companies controlled by the EDF group, in all the countries in which EDF operates, and concerns both its employees and its subcontractors' employees working on its facilities and premises. This undertaking is accompanied by a roadmap that mobilises the Group's entities to achieve the objectives set. The Executive Committee reviews health and safety figures and monitors action plans regularly. Since 2015, a Strategy Committee made up of executives appointed by the Executive Committee members has been overseeing the implementation of the policy and preparing decisions to be submitted to the Executive Committee.

The Group strives to set an example in the area of Health and Safety. The main priority is to eradicate fatal accidents, then reduce the number of accidents and combat absenteeism. This ambition and these priorities for the coming years are implemented in all the companies of the Group.

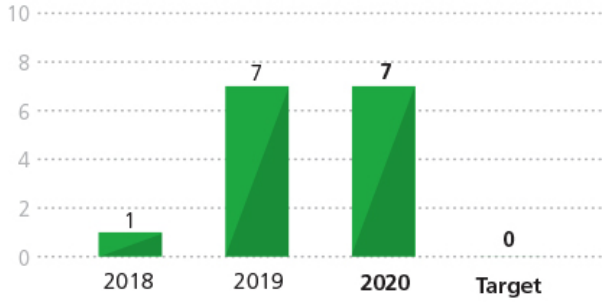
3.3.1.3.2 Eradicating fatal accidents

In 2020, continuing the initiatives started in 2015, the Group focused on 10 key rules, which were adopted following an analysis of fatal accidents in the EDF group over the last 30 years, which everyone must follow as they go about their work in order to avoid serious accidents and protect both themselves and those around them.

To maintain the safety culture and risk awareness, a collection of High Potential Events (HPE) has been arranged, more than half of which are near-accidents or dangerous situations. The analysis of the events is shared at the Group level, focusing on those related to the 10 key rules of the Group.

There were seven fatal accidents directly related to work in 2020 [5].

Number of fatal accidents connected to business-specific risks (employees and providers)



Key non-financial performance indicator

To tackle this problem, the Executive Committee has asked each business line to take action to improve the adoption of the key rules by all Group employees and providers and has also asked managers to emphasise the shared vigilance approach within their teams. As part of this, the Chairman decided to arrange a "STOP safety" throughout the Group. On 20 October 2020, all teams met to discuss their approach to safety issues. The meetings focused on compliance with the key rules and the problems encountered when applying the rules. They led to concrete action implemented within each team, to be monitored by Group HR.

The development of the Shared Vigilance approach, marking the individual commitment of each and every individual to a Company-wide safety culture, is key to making progress in the area of prevention. Employees are encouraged to follow e-learning courses developed by the Safety Academy. For example, in 2020, 18,459 EDF employees followed a training course on this subject, exceeding the 15,000 target set in the EDF profit-sharing agreement. These efforts supplemented the "Shared Vigilance" training course engaged over the last years, which was taken by 25,775 employees in 2018 and 2019.

(1) World Association of Nuclear Operators.

(2) Operational Safety Review Team.

(3) See section 1.4.1.1.2.3 "Nuclear issues" – "Environment, nuclear safety, radiation protection" in France and for the United Kingdom: section 1.4.5.1.2.1 "Nuclear generation".

(4) Arithmetic mean.

(5) The methodology associated with this indicator is explained in section 3.7.2.2 "Details on performance indicators".

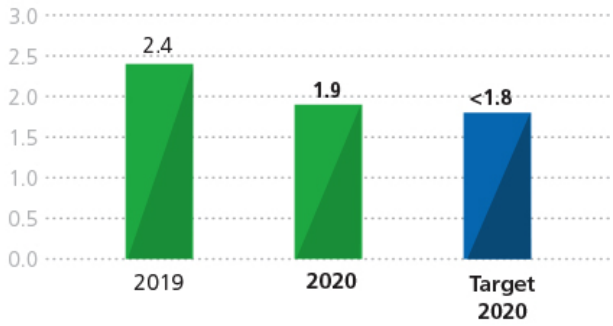
One of the main areas of focus in 2020 was the position of the employees of providers. The best offer criteria have been reviewed and their inclusion in contracts has increased significantly. All companies submitting a bid must now provide a health and safety self-assessment, otherwise their bid will not be admissible. In addition to the initiatives already implemented by the Group's entities and subsidiaries, a working group representing around 20 providers was set up in November 2020 at the Group level to define shared measures for improvement. A survey was also launched in December 2020 to obtain direct feedback from employees of providers working in the field.

Reducing work-related accidents

In order to have comparable data between Group entities and measure accident rates directly related to the performance of activities, EDF set-up a new "LTIR" indicator corresponding to the calculation of the frequency rate according to Anglo-Saxon standards. This indicator has been monitored since 2017 and disclosed since 2019.

The 2020 goals of the health and safety policy are now expressed on the basis of this new indicator (EDF LTIR below 1.4 and global LTIR: EDF + providers below 1.8). Overall, the various LTIRs have improved, enabling the Group to achieve the goals set in the health and safety policy. The increased use of remote working arrangements during the health crisis led to a significant reduction in same-level falls (and therefore the LTIR), particularly for EDF group employees [1].

Global LTIR (employees + providers)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

Further details on work-related accidents and occupational illnesses [2]

EDF group	Unit	2018	2019	2020
LTIR Group employees		2.0	1.8	1.4
Employee work-related accidents with at least one lost day	Number	667	434	351
Accident severity rate		0.13	0.14	0.13
Occupational illnesses	Number	nd	63	41

The drop in occupational illnesses over the past few years follows a drop in the number of reported asbestos-related illnesses, confirming the success of the prevention and protection measures implemented within the Company.

3.3.1.3.3 Well-being and psychosocial risks

Combating absenteeism, preventing psychosocial risks and improving well-being at work

Among the crucial areas for improvement, prevention of anxiety- and depression-related disorders, stress and musculoskeletal disorders (MSD), the three main causes of absenteeism, are regularly targeted by prevention initiatives.

The development of team empowerment projects led to a significant drop in absenteeism among the employees of the teams involved, due to the positive health impacts of the improved quality of life in the Groups and the increased levels of commitment and meaningfulness of work.

	2018	2019	2020
Number of days of absence per employee per year	9.1	9.1	8.8

Health in the workplace and general health issues

The EDF group employs staff specialised in health at work. The Group also employs physicians who are experts in toxicology, ergonomics, epidemiology, first aid, and radiation protection. In addition to medical monitoring of employees, these healthcare workers are involved in setting up primary prevention programmes and are stakeholders on all the social dialogue bodies in the field of health at work, thus reducing absenteeism and occupational illnesses.

With the support of its medical teams and the safety officers at its entities, the EDF group is also committed to public health issues such as addiction and cardiovascular risk prevention. In 2020, the EDF group became involved in the "1 Moi(s) sans tabac" anti-smoking campaign run by Santé publique France (French Public Health Agency) and decided to sign up for the national "Les Employeurs pour la santé" employer health promotion campaign. These initiatives help motivate employees with the support of the Company's health and safety network.

As part of the preparations for the 2024 Olympic Games, actively supported by the Group, a project has been launched to enable a group of 28 top-level athletes who support the Group and embody its environmental, social and societal values to be assisted by the TEAM EDF [3]. The aim is to develop, in liaison with the medical teams, a positive collective promotion of "Sport for Health", which is all the more important now, given the health crisis and lockdown.

(1) The 2023 goal is to maintain an LTIR level of less than 1.8.

(2) The methodology associated with this indicator is explained in section 3.7.2.3 "Further details on other environmental, social and societal data included in the non-financial performance statement".

(3) edf.fr/groupe-edf/agir-en-entreprise-responsable/fondation-et-mecenat-patrimoine-sport/sport/team-edf#plus-grand-plus-fort-le-team-edf-se-renforce.

3.3.1.3.4 Well-being, organisation of work and working hours

In order to meet the needs relating to each company's business and particularly to ensure continuous operation, the Group's employees may be required to provide a continuous service or be on call outside of regular working hours. These arrangements are adapted over time according to the changing circumstances at each company, legislation and new authorised work organisation practices, particularly communications technology developments. For companies based in France, the duration of the working week in France is 35 hours, with services available for a minimum of 5 days.

Group entities are seeking to modernise the organisation of working time to promote employee agility and empowerment. Following the implementation of agreements for a fixed number of working days a year in most of the Group's companies (EDF, PEI, Sowee, etc.), which have been signed by almost all managers, the EDF group, as part of the CAP 2030 transformation project, has implemented work organisation policies addressing the challenges of simplification, empowerment and innovation:

- for EDF, a teleworking agreement was signed for all employees along with an agreement on the organisation of work implementing collective projects for the operation of each work team. Based on the lessons learned from the health crisis, trials are being launched to continue to improve the organisation of work and conduct new negotiations on this subject;
- a significant shift to a paperless, automated approach for certain tasks, such as electronic signatures and the development of remote collaboration tools;
- various remote working solutions, "Welcome" (allowing employees to regularly work at another Group site closer to their home) and "*Mon Job en proximité*" (my local job) (allowing employees to have a reference work site close to their home, even if not shared by the rest of their team), are also being implemented at EDF in order to break down the barriers to mobility and help employees achieve a good work-life balance;
- several team empowerment schemes have been introduced as part of the "osons la confiance" (dare to trust) project, to give teams a greater opportunity to show initiative and take decisions, in order to improve commitment and performance levels.

The exceptional circumstances in 2020 have shown how important it is to capitalise on the trials conducted in the areas of empowerment, new approaches to the organisation of work and remote working and teleworking arrangements in the Company's various business lines. The Company has strengthened managerial responsibility for the TAMA project (another way of working, another way of managing) launched by the Executive Committee in all the Group's departments and subsidiaries.

3.3.1.3.5 Well-being and social welfare

Long-term social welfare policy

The Group's employee benefits policy is based on three main principles: a principle of accountability, a principle of balance between competitiveness and sustainability, and a principle of appropriation by beneficiaries.

A specific social welfare scheme

In France, the majority of the Group's workforce are employed by companies descended from "historic operators" (EDF, Enedis [(1)], PEI) which have electricity and gas industry or "EGI" status. This status carries an entitlement to special social security schemes, including special sickness, disability and pension schemes. If employees with EGI status are unfit for work (sickness/maternity/disability), they thus benefit from a customised level of cover. In terms of healthcare costs, in addition to the basic scheme, their special scheme includes an additional mandatory part, which also covers retired employees. Employees with EGI status and EGI pensioners have access to centralised social activities, financed by the companies in the professional branch and managed independently by the unions. In addition to these schemes, there is a benefit in kind historically based on a company decision which covers gas and electricity supplied by historic operators to employees and which is maintained for retired employees.

Significant changes over the last decade

EDF's IPO and the application of international accounting standards required the valuation and provisioning of commitments to retired employees. The maintaining of the industry's special welfare plans faced with this requirement was supported by the overhaul of their financing: affiliation with standard mandatory plans for pensions and strengthening of affiliation between current and retired employee plans for complementary health insurance cover.

The special pension plan has also, like other public sector special pension plans, been increasingly affected by efforts to reform mandatory pension plans launched by successive governments. Except for the pension calculation method (specific rate, applied to a salary at the end of career, with a reduced base), the main parameters (retirement age, required contribution period, etc.) tend to be in line with the standard compulsory plan. A number of other less wide-ranging rules remain specific. The definition of active service, enabling earlier retirements, has also been revised and how it is taken into account significantly overhauled for newly-hired employees, *via* the creation of a Retirement Days Savings Account. In addition, a bill introducing a universal pension system for all employees affected by the reform, regardless of their pension scheme, including the EGI scheme, was examined by the National Assembly in February 2020, before being suspended on account of the Covid health crisis.

If the government's proposed pension reforms go ahead, even in a different form, there will be three major issues for the EDF group:

- social: the special pension scheme is one of the pillars of the EGI status and is a major political and symbolic issue;
- financial: the special EGI pension scheme represents an additional financial burden of several hundred million euros per year, and some twenty billion euros in commitments;
- transformation: particularly with regard to the fluidity of mobility within and outside the Group (as differences between pension schemes constitute one of the main barriers).

Since the beginning of the consultation process, the Company has been keeping a close eye on the consequences of this reform for all its employees, regardless of their status. It will continue to monitor the situation if the proposed reforms are put back on the table at the beginning of 2021.

The level of employee health, disability and life cover appeared to need updating to meet that offered by other major groups, which led to the introduction in 2008 of complementary cover in these three areas, in the form of an agreement at branch level.

An agreement on family rights was signed in 2017 at the level of the EGI branch with the trade union organisations, to modernise the social system and reflect the changes to family life that have occurred since 1946 by adapting the EGI status in a concerted manner.

In terms of health insurance, 2020 saw the culmination of an in-depth consultation between the social partners of the EGIs and the government concerning a rebalancing of the accounts of CAMIEG (health insurance fund for the electricity and gas industry), which have carried a surplus since its creation in 2007.

The rebalancing is based on a reduction in employer and employee complementary health insurance contributions, a reduction in the solidarity contribution paid by the working population for the non-working population and an improvement in optical benefits. €175 million of the surplus was also transferred to the CNAMTS (national health insurance fund for employees), €40 million for the working population accounting section and the rest from the non-working population section.

These measures should allow the fund's accounts to be restructured in a sustainable manner, for the benefit of EGI employees, with a positive financial impact on their pay in 2021 and 2022: the rate of employee complementary health insurance contributions is 25% less than in 2020 and, from 2023 onwards, this rate reduction will remain 5% less than the 2020 rate of employee contributions. In addition, the solidarity contribution paid by the working population for the non-working population has been permanently reduced by 17%, from January 2021. These measures will also improve health benefits.

Other Group employees' social welfare

The Group's other employees in France are covered by several collective bargaining agreements and can have fringe benefits provided by their own employer. Each employer must therefore ensure that the benefits provided are consistent with the Group policy. For Group companies outside France, even if the regulatory context specific to each country must be taken into account, each entity is required to ensure that the capital paid out in the event of a death under death benefit contracts covers one year's salary at the very least. This social protection matter is regularly discussed with the Group's Human Resources Department.

(1) Network operator, independently managed.

3.3.1.4 Consumer health and safety

"Well-being" is at the very heart of EDF's *raison d'être*. Its commitments in this area affect many aspects related to the safety of its facilities and the action taken to protect the health and safety of all its stakeholders. The action taken for its customers, partners and civil society to tackle the health crisis is explained in the introduction to this chapter ("EDF, a responsible approach to tackling the health crisis").

EDF group's low-carbon generation has positive impact on air quality (see section 3.3.1.5 "Air quality"), and the electricity generated offers consumers a comfort that contributes to solving major public health challenges (cold chain, lighting, indoor air, indoor circulation, etc.). To ensure a use in the safest conditions, EDF has recently updated its long-standing information and awareness-raising schemes [(1)].

3.3.1.4.1 Reduction of noise and light pollution

More specifically regarding acoustic risks, the Group endeavours to prevent and mitigate impacts in terms of noise pollution. For electricity generation, acoustic studies are conducted from the initial design stage and are included in environmental impact studies. A special community has been set up ("Code Tympan"), based on a digital modelling system available as open-source software within the Group. Acoustic measurement campaigns are run in the area surrounding nuclear power plants, at a rate of two sites per year, and the results are presented to Local Information Committees.

EDF Renewables also performs acoustic studies from the initial development phase and the noise levels of turbines form part of the selection criteria for machinery. The same level of attention is given to noise pollution in the Group's international and French subsidiaries. For example, Électricité de Strasbourg's fleet now includes electric aerial lift trucks.

All new transformers purchased by Enedis [(2)] now use low-noise air coolers.

With regard to the action taken to prevent light pollution, Citelum has implemented a system of sensors to adjust the intensity of lighting on the road network based on traffic density and driving speeds, which also improves car safety.

Awareness-raising initiatives tackling light pollution are periodically implemented locally, for example a recent partnership with "les jours de la nuit" (dark skies) on Réunion Island.

3.3.1.4.2 Sales offerings promoting well-being and health

Sales offerings promoting well-being, home comfort and health include advice, works, support for facility management and also targeted offers. The edf.fr website provides a wide range of information to improve occupants' thermal comfort and well-being. EDF facilitates work designed to enhance comfort by establishing relations with qualified partners (EDF's Économies d'Énergies partners) and helping to finance the work. In terms of facility management, Sowee offers residential customers a connected system capable of controlling their heating, analysing air quality, weather, traffic and pollution. Dalkia has deployed SERENIS, an offer dedicated to healthcare facilities (heating, air-conditioning, etc.), ensuring both facilities' regulatory compliance and the implementation of health risk management procedures [(3)].

3.3.1.5 Air quality

3.3.1.5.1 Improving air quality by transforming the generation fleet

EDF is changing its fossil generation fleet, in its ambition to "Reduce air emissions of SO2, NO_x and dust from the Group's fossil-fired thermal fleet by 50% between 2005 and 2020 [(4)] ".

The EDF group is continuing its scheduled shutdown of its fossil-fuel fired facilities (see section 3.1.1.3.1 "Coal-fired power generation, currently representing 0.4% of the total power generation, to be reduced to 0 by 2030").

In parallel, the EDF group is continuing its process of modernising and improving the environmental performance of its thermal fleet, until it meets European best available techniques requirements. Modernisation work was carried out this year on the Fenice Poland facilities. Regarding island systems, actions are taken to reduce NO_x, on a case-by-case basis: optimising exhaust gas processing, or reducing the number of hours of operation for certain turbines. In Brazil, the emission levels of the Combined Gas Cycle power plant in Norte Fluminense are below its NO_x limit of 25 ppm, mainly due to the high level of equipment maintenance. Using its future exhaust gas processing system, the Edison CGC project in Italy, Marghera Levante (780MW with 63% efficiency), which should be commissioned in 2022 to replace two old facilities, will emit a quantity of NO_x equivalent to 30% of the current facility's limit.

EDF is continuing to test biofuels (low-sulphur fuels) to replace fossil fuels (liquid biomass to power a motor in Molène, France, and the power plant in Jarry, Guadeloupe) and is also developing an alternative fuel made from wood waste to fuel boilers in Cordemais, France [(5)]. At the same time, EDF is developing non-NO_x and SO_2 emitting technologies and proposes, in the island systems, isolated 100% renewable energy systems in addition to the initiatives for controlling energy demand and saving energy.

In 2020, these actions resulted in emissions of 17,000t of SO_2, 30,000t of NO_x and 3,000t of dust at the Group level.

SO_2 and NO_x emissions due to heat and electricity generation *(kt)**	2018			2019			2020		
	SO_2	NO_x	Dust	SO_2	NO_x	Dust	SO_2	NO_x	Dust
EDF group	21	45	3	18	36	3	17	30	3
EDF	4	16	0.2	4	10	0.4	3	9	0.2

* *The methodological details associated with these data are explained in section 3.7.2.3 "Further details on environmental, social and societal data from the Statement of non-financial performance".*

(1) Various schemes have been set up in all relevant Group structures in France, Italy, the United Kingdom, etc. For example, EDF systematically sends a safety instruction booklet to all customers who take out a natural gas subscription. These instructions can be accessed on the edf.fr website. Enedis also develops partnerships with organisations representing the main high-risk groups to raise awareness of the risks of fishing near power lines, or to boost cooperation in the prevention of risks relating to firefighting work near power grids. Overseas, EDF in the UK informs its customers of the potential dangers of electricity in newsletters or on the back of bills. EDF in the UK also has a toll-free number to inform its customers about safety practices. Specific action is taken regarding the most vulnerable customers to promote their health, particularly during the winter period.

(2) Independently managed subsidiary.

(3) Other specific dedicated offers are also available: Sérénis Bloc OP: offer dedicated to healthcare facilities with controlled-environment zones, such as operating blocks. SeniorSolution: an offer developed to help nursing homes achieve energy and economic efficiency.

(4) Target in paragraph 2.3 from the EDF group's SD policy. In 2005, emissions were 236kt, 209kt and 14kt respectively.

(5) As part of the Ecocombust project.

3.3.1.5.2 Improving air quality by supporting public initiatives in this area

EDF [1] has historical know-how on the understanding and modelling of atmospheric emissions and air-conditioning systems of buildings. With CEREA [2], EDF R&D participates in the scientific effort by developing open source models [3]. This expertise is provided to the scientific community and local authorities, to address public health issues. In Paris, Lille and the department of Haute-Savoie, the distribution network operator Enedis [4]' vehicles are equipped with a network of air quality sensors called Pollutrack. This is the first company fleet to contribute to improving air quality by detecting and measuring pollution caused by the finest particles which are the most dangerous for health. In practice, 300 Enedis Paris vehicles are equipped with laser sensors measuring PM 2.5 fine particles wherever they travel and transfer approximately two million daily readings to Airparif, which displays them on a map and marks the hotspots.

Airparif has also partnered with Citelum for a trial being conducted in Asnières-sur-Seine: installation of cameras and sensors on urban infrastructure to measure mobility flows and atmospheric variations in sources of pollution in real time. By comparing data from connected devices in 2020, corrective action has been proposed to improve mobility flows and minimise the impact. This scheme, tested *via* AIRLAB [5], is being considered in other towns and cities.

EDF contributes, in particular via its Medical Research Department, to preventive and research initiatives on the health impact of air pollution engaging in the Association for Prevention of Air Pollution (APPA) and the Inter-professional Technical Centre for Studies on Air Pollution (CITEPA), and being an active member of the SFSE (French Society for Health and the Environment). This year, the APPA focused its work on the link between outdoor air pollution and Covid and the effects of the lockdown on indoor air quality. At a local level, EDF supports air quality monitoring associations (AASQA).

3.3.1.5.3 Improving the indoor air quality of buildings

EDF provides a range of innovative solutions to improve the indoor air quality of buildings, a public health issue impacting the well-being of occupants. The town of Villiers-sur-Marne has joined forces with EDF to implement urban renewal and construction projects to improve and control indoor and outdoor air quality "from the street to the living quarters". Using a scientific approach developed by CEREA, concrete solutions can be developed and scaled to improve the treatment of air quality and reduce personal exposure to air pollution and contamination. In 2020, this goal led to the creation of the first digital air quality demonstrator in a show flat.

Dalkia is assisting not only healthcare facilities with operating blocks to comply with indoor air quality regulations, but also operators of public buildings. It has broadened its range by offering air network balancing, duct cleaning, room reclassification and health risk advice services.

To develop solutions takes innovation and team work. Dalkia developed NemoPool with the start-up ETHERA to make both swimmers and pool staff more comfortable. This tool, which regulates the level of trichloramines by controlling ventilation systems, is a world first.

Covivio and EDF have joined forces with the Impulse Partners incubator to launch the Air Quality Challenge. This is a European call for projects aimed at start-ups, SMEs, laboratories, associations and large companies proposing innovative services in this field. After assessing applications based on criteria related to the improvement of indoor air quality and the energy efficiency of the proposed solutions, Covivio and EDF selected the following companies: Octopus Lab and Enerbrain. They will be able to test their solutions in buildings owned by Covivio and EDF. For residential customers, the Sowee smart station already measures indoor air quality and provides information on the level of outdoor air pollution.

3.3.2 Ethics, compliance and human rights

The EDF group promotes a culture of integrity and applies a zero tolerance policy towards fraud and corruption. Ethical conduct in accordance with the law is the absolute rule for all Group employees, at all levels of the organisation, and without exception. The EDF group is committed to respecting and ensuring respect for human rights in all its activities and wherever it operates.

3.3.2.1 Organisation of ethics and compliance at the EDF group

3.3.2.1.1 Governance

The EDF Executive Committee (Excom) is responsible for determining the orientations and priorities of the ethics and compliance programme, allocating the necessary resources and ensuring the monitoring and control of its implementation. The Board of Directors of EDF, through its Corporate and Social Responsibility Committee, oversees the Company's incorporation of ethical and compliance considerations into its works. Every year, the Executive Committee and the Governance & Corporate Responsibility Committee also receive an activity report drawn up by the Group Ethics and Compliance Department.

3.3.2.1.2 The Group Ethics and Compliance Department and its ethics and compliance network

Reporting to the General Secretary, the Group Ethics and Compliance Department manages and coordinates, in liaison with the departments concerned, the implementation of the Group's ethics and compliance programme. This programme is created to meet the requirements of national and international regulatory authorities and local practices. The programme places all EDF Executive Directors and, more generally, all employees at the heart of the compliance system.

A network of around 50 Ethics and Compliance Officers within its entities and subsidiaries (excluding regulated subsidiaries), both in France and internationally share and deploy the Group's Ethics and Compliance Policy.

The Ethics and Compliance Officers take part in Management Committee meetings and report directly to the directors of the entities on ethics & compliance matters and on the associated action plans. EDF is a member of several anti-corruption groups and non-profits. In 2016, it joined Transparency International France, in which it participates in the Forum of Engaged Companies ("*Forum des Entreprises Engagées*" or FEE), which gathers companies looking to adopt the highest standards of transparency and integrity.

3.3.2.1.3 Group Ethics Charter and its values

The Group Ethics Charter sets out the values shared by all EDF staff, places ethical requirements at the heart of corporate responsibility and, in accordance with the Chairman's commitment, promotes ethical behaviour in all professional activities. Updated in 2019, the Group Ethics Charter now focuses on the Group's three values "Respect, Solidarity and Responsibility", each featuring 4 requirements. It is available in French and English on the EDF group website and in eleven other languages in which the Group works.

(1) More specifically, it involves the MFEE Department of EDF R&D.
(2) Atmospheric Environment Education and Research Centre, a joint laboratory at EDF R&D and the *École nationale des ponts et chaussées*.
(3) Free access to source code.
(4) Independently managed subsidiary.
(5) Airparif's laboratory of innovative air quality solutions.

3.3.2.1.4 Group Ethics and Compliance Policy (PECG)

In 2016, the Executive Committee adopted the Group Ethics and Compliance Policy (PECG), which comprises the Company's compliance programmes as well as the main rules that Executive Directors should know, observe and enforce within their entities, which are strictly aligned with the risks of these entities. The PECG was updated and approved by the Executive Committee in January 2020 and now includes thirteen compliance programmes:

- preventing the risk of corruption and influence peddling;
- preventing conflicts of interest;
- fight against fraud;
- compliance with international sanctions programmes;
- prevention of harassment and discrimination;
- prevention of market abuse;
- prevention of the risk of money laundering and financing of terrorism;
- compliance with the EMIR regulation;
- compliance with the REMIT regulation;
- preventing breaches of competition law;
- personal data protection;
- export control (dual-use goods);
- the duty of care (covering environmental, human rights and health and safety issues).

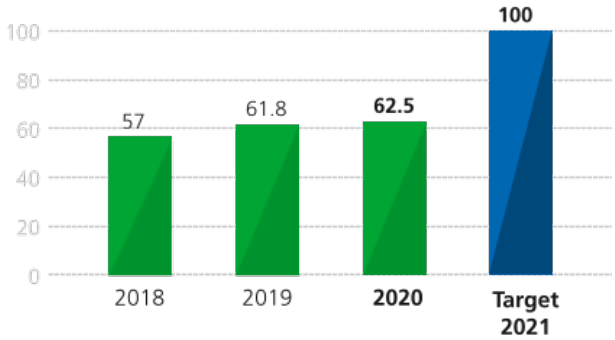
3.3.2.2 Anti-corruption and other compliance programmes

3.3.2.2.1 Anti-corruption programme

In accordance with the French law of 9 December 2016 on transparency, the fight against corruption and the modernisation of the economy, known as the "Sapin II" Law, EDF set up an anti-corruption compliance programme taking account of legal requirements:

- **an ethics & compliance code of conduct included with the internal rules of procedure and a disciplinary mechanism.** This code of conduct defines and illustrates, through practical cases, the different types of behaviour employees are likely to face as a result of the Company's business activities and organisation, and which should be prohibited given that they may constitute acts of corruption or influence peddling. It sets rules for all the themes identified during the risk mapping process. It prohibits facilitating payments, and restricts gifts and invitations. Breach of any of its rules may result in disciplinary sanctions. It can be viewed by third parties on EDF's site in French and English [(1)]. An updated version of the code of conduct is scheduled to be released early 2021, integrating two new issues (lobbying and sponsorship), in line with the Group corruption risks mapping;
- **a whistleblowing system** (described below);
- **risk mapping:** Ethics & compliance risk mapping is part of the Group Risk Department's annual internal control self-assessment process. Based on this, the entities draw up action plans appropriate to their operational contexts to prevent and mitigate these risks. Since 2018, a specific "corruption" risk map was prepared, which identifies and prioritises, by business sector and country, risks of exposure to corruption. In 2020, the methodology used for the mapping was improved, to enhance its focus on the operational specificities of the Group's various business lines and geographical locations;
- **third-party integrity control system** Under the Group Ethics and Compliance Policy, executives of the relevant Group entities are required to implement a system within their entities to control the integrity of any partners with which the Group plans to establish or continue a business relationship, mainly designed to check that there are no risks of exposure to international sanctions and that a clause is inserted in each contract entitling EDF or its subsidiary to terminate a business relationship with immediate effect in the event of a failure to adhere to an international sanctions programme;
- **accounting controls:** control procedures, containing specific requirements for the detection and prevention of corruption, have been defined for the Company's various processes. Following a technical analysis, any anomalies likely to be characterised as fraud are, where applicable, forwarded to the entity's Ethics and Compliance Officer;
- **training schemes:** The Group Ethics and Compliance Department develops prevention measures and training for all employees of EDF and its subsidiaries (excluding regulated subsidiaries), including:
  - the first Group Ethics and Compliance Day, held in December 2019,
  - a dedicated community on the Group intranet providing a range of training materials,
  - the implementation of e-learning training modules, in particular an interactive training course on the code of conduct, in French and in English, to allow employees to improve and test their knowledge, to which two new modules will be added in 2021, lobbying and sponsorship, in line with the new version of the code of conduct,
  - specific face-to-face training: standard training for members of the ethics and compliance network, subsidiary directors and contract managers and two new training courses for employees tasked to assess third parties and process wrongdoing reports,
  - the Group Legal Affairs Department also provides a "Preventing corruption" e-learning module, for staff to learn about how best to behave in situations relating to business relations, conflicts of interest and gifts. In 2020, the Group Ethics and Compliance Department and the Legal Department updated the e-learning module to include influence peddling,
  - at the end of 2020, it became mandatory for all employees starting a position exposed to corruption risks to follow an anti-corruption e-learning module (e-learning module added to the standard training given to managers, project managers, buyers and contract managers, etc.),
  - the percentage of Group executives who have received training on the prevention of corruption and influence peddling has been specifically monitored since 2019. The methodology associated with this indicator was modified for 2020, which led to a mathematical reduction in the percentage of executives compared to 2019. The indicator stood at 62.5% on 31 December 2020 with a target of 100% of executives to be trained by 31 December 2021.

Proportion of executives who have completed the anti-corruption training programme



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".
Calculation methodology revised in 2020 to include only executives currently serving.

- **internal control and evaluation system:** To ensure the appropriateness and effectiveness of measures to prevent and detect misconduct, a system allowing entities to evaluate the level of implementation and meeting of each key requirement has been put in place. It enables identification of improvement actions to be taken;

(1) edf.fr/sites/default/files/contrib/content/engagement%20ethique%20et%20confirmite%20groupe/page%203/code-de-conduite-fr.pdf.

- **a system to prevent conflicts of interest:** the entities have put in place a system designed to prevent conflicts of interest and raise employee awareness of high-risk situations, provide a system for employees to declare their links to organisations in which they have a personal interest, and require managers to resolve conflicts of interest with respect for individual freedoms. A support guide, including case studies to help managers identify and handle conflicts of interest, was introduced early 2021;
- **fight against fraud:** In accordance with the "Fight against fraud" memorandum of instructions, executives are tasked with setting up systems within their entities to raise awareness among their staff, put in place checks to detect potential cases of fraud, investigate incidents, report proven cases and sanction those responsible;
- **regulation of interest representatives:** EDF is an interest representative within the meaning of the Sapin II law. In this respect, it is registered on the list of interest representatives managed by the HATVP (French High Authority for Transparency in Public Life). The network managers RTE, Enedis [(1)], and Dalkia are also registered: they each declare interest representation actions carried out during the year. The list of persons in charge of an interest representation identified in the register will be updated regularly. EDF also files with the HATVP [(2)] an annual declaration relating to interest representation actions carried out that mentions actions aimed at influencing a public decision, with national public officials identified by the legislator. Lastly, lobbying has been added to the new version of the code of conduct;
- at the European level, EDF is listed on the Transparency Register of the European Parliament and the European Commission (no. 39966101835-69), regularly updates its data and applies the related code of conduct. In addition, in order to continue to raise awareness of ethical issues among interest representatives, the European Affairs Department has published its own internal ethics charter (EU Lobbying Rules), available on the EDF website. EDF presents its positions publicly *via* this transparency register [(3)], and *via* associations of which it is a member [(4)]. Its main messages are also posted on social media (LinkedIn, Twitter). The European Affairs Department has introduced a regular internal control process for these associations to ensure that they match its *raison d'être*, following which decisions may be taken (withdrawal or new membership) where necessary. The estimated annual cost of the activities covered by the European Transparency Register since 2016 is around €2 million, with a downward trend. In 2020, the main initiatives focused, in particular, on the following priorities: support for the climate ambition (-55%) and the development of low-carbon electricity generation sources (including offshore), acceleration of the electrification of the economy, promotion of low-carbon hydrogen and support for the sustainable finance action plan and taxonomy;
- **regulation of financing of political parties:** The EDF group complies with the laws and regulations in force concerning the financing of political parties. Such financing may take place only in countries that allow it, and only with due regard to the principle of neutrality. In accordance with the legislation in force in France, EDF makes no payments to political parties. The Group's Italian and UK subsidiaries have written directly into their codes of conduct the prohibition of financing political parties. In countries where it is allowed (such as the United States), EDF group companies may determine whether they wish to provide financial support. Every year, the Group companies concerned must report any financing to their parent company. In 2020, EDF Renewables made payments in the United States, consisting of US$55,000 in the form of Political Action Committee contributions and US$662,750 in the form of Corporate contributions.

3.3.2.2.2 Prevention of harassment and discrimination

Banning all harassment or discrimination, and preventing and dealing with any physical or psychological violence, intolerance or injustice in the workplace are some of the requirements of the Group Ethics Charter. This commitment is part of the regulatory and judicial context which, in many countries, incriminates not only the actions and behaviours themselves, but also employers who fail to implement sufficient preventative measures. More specifically, executives must take all necessary steps to prevent discrimination, harassment and physical and emotional abuse within their entities by striving to make employees aware of the risks of harassment and discrimination. They must also provide regular information about the Group whistleblowing system and take appropriate disciplinary action in the event of proven wrongdoing.

Two reference guides designed to prevent and combat bullying and sexual harassment have been distributed, primarily to managers, the HR department and the Ethics and Compliance Managers of entities. They have been published in a simplified format for all employees. Two training courses are now available, for all employees, on e-Campus. One covers identifying and understanding the links between stereotypes and discrimination, through a serious game called *Vivre ensemble la diversité* (experiencing diversity together). The other course is an anti-sexism course ("*Sexisme, pas notre genre*") to help employees understand sexism in the workplace.

3.3.2.2.3 Financial ethics

The Ethics and Compliance Policy sets out the requirements to be followed to prevent market abuse, the risk of money laundering and the financing of terrorism. An Ethical Code for Trading in Securities, updated in 2020, complements this Policy. The Group Ethics & Compliance Policy also sets out the requirements concerning compliance with the European EMIR regulation. The practical implementation of this EMIR regulation by the EDF group, the implications for entities as well as the related processes and controls are described in the EDF group EMIR Policy Paper support guide.

3.3.2.2.4 Compliance with the REMIT regulation

In accordance with the Group Ethics & Compliance Policy, entities concerned must put in place a European REMIT regulation compliance programme. A "Group Compliance Officer" was appointed in September 2017 and was tasked with preventing risks of non-compliance, by developing an appropriate control environment. The practical implementation of this REMIT regulation by the EDF group, the implications for entities as well as the related processes and controls are described in a memorandum of instructions. An online staff training tool has been set up. It is freely available on VEOL, the EDF group intranet.

3.3.2.2.5 Preventing breaches of competition law

EDF group has made awareness of and adherence to competition law a major priority for its employees. With this in mind, the Group has implemented a Competition Law Compliance Programme since 2010. The programme, which is binding on all employees, aims to ensure that all operations of subsidiaries and entities of the Group in France and worldwide comply with competition law. After rolling out an e-learning module between 2010 and 2015 which trained over 5,400 employees, in France and abroad, since 2016 a more non-specialised Serious Game called: "Cap Antitrust" is accessible to all employees on the Group's internal training portal, in multiple languages (French, English and Italian).

3.3.2.2.6 Personal data protection

EDF, which appointed a Personal Data Officer (PDO) in France as early as 2006, appointed its Data Protection Officer (DPO), pursuant to EU regulation 2016/679 of 27 April 2016 known as the general data protection regulation (GDPR). The DPO is the Lead Manager for the Group. Around twenty DPOs have now been appointed in French and European subsidiaries and Personal Data Contacts (Relais informatique et libertés) are present in all entities. The DPOs are responsible for ensuring compliance with regulations relating to the protection of personal data within the Group, whether with regard to the personal data of its customers, employees, service providers or partners. Regular awareness-raising initiatives are conducted in the fields of personal data protection and privacy and a new e-learning training course has been rolled out for all employees.

(1) Independently managed network operators.

(2) hatvp.fr/fiche-organisation/?organisation=552081317

(3) ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=39966101835-69

(4) avere.org/wp-content/uploads/2019/02/the_electrification_alliance_-_declaration-2017-030-0453-01-e.pdf (The Electrification Alliance Electricity for an Efficient and Decarbonised Europe)

3.3.2.2.6 Export control and international sanctions

In the course of its operations, particularly in the nuclear field, EDF and its subsidiaries carry out a range of operations to meet their own needs or the needs of third parties, requiring the use of goods and technologies including dual-use goods and technologies ("DUG"), *i.e.* civil and military, that can expose it to certain risks inherent in specific French, European and/or foreign regulations, some of which have extraterritorial scope, and can require the issuing by the competent authorities of a license/authorisation prior to any transfer, export, re-export, brokerage, and/or transit of such goods and technologies. Some regulations, particularly in the United States, have introduced restrictions on access to goods and technologies applicable to foreign entities that may affect both DUGs and any other commercial goods.

In addition, the Group, or some of its partners, may be exposed, directly or indirectly, to sanctions programmes, in particular (i) international sanctions adopted by the United Nations Security Council, (ii) sanctions adopted by regional organisations such as the European Union, and (iii) sanctions adopted unilaterally by certain States, some of which have extraterritorial scope.

A Group Export Control and International Sanctions Department was set up in August 2019 to strengthen the Group's ability to comply with these regulations. A memorandum of instructions describing the compliance procedures to be implemented was adopted by the Executive Committee on 4 May 2020.

3.3.2.2.7 Duty of care

EDF's vigilance policy is implemented through a "Duty of Care" (DoC) scheme set out in the Group Ethics and Compliance Policy. It must be rolled out by executives within their entities and involves, in practice, the production, publication and implementation of a vigilance plan, in accordance with Law no. 2017-399 of 27 March 2017 relating to the duty of care of parent companies and ordering companies.

A Group DoC Compliance Officer, reporting directly to the Group General Counsel, is responsible for supervising and coordinating this policy, in particular the production of the vigilance plan based on feedback from the entities, in liaison with the Sustainable Development Department, the Ethics and Compliance Department, the Legal Department, the Purchasing Department, the Human Resources Department and the Risk Department. A DoC Officer, appointed at each Group entity, is tasked to implement the entity's DoC scheme and report back on its effective implementation. The Group DoC Compliance Officer coordinates the network of local DoC Officers (see section 3.6 "Vigilance plan").

A mandatory self-assessment form on this theme has been added to the internal control guide.

3.3.2.3 Human Rights

One of the EDF group's fundamental goals is to endeavour to respect and ensure respect for human rights in all its activities and wherever it operates.

In March 2021, EDF drew up a set of guidelines listing the commitments of the Group (EDF SA and its controlled subsidiaries [(1)]) and the fundamental requirements for its business relationships in terms of human rights and fundamental freedoms, environmental protection, protection of personal health and safety and business ethics.

In the guidelines, the Group notes and summarises its commitments in terms of compliance with international standards, the rights of its staff and the rights of local communities in particular.

3.3.2.3.1 Compliance with international standards

The EDF group does not tolerate any infringement of human rights or fundamental freedoms in its operations or in those of its business relationships for operations related to the relationship. EDF strives to comply, as a minimum level, with the international standards protecting and defending human rights and fundamental freedoms, including the United Nations International Bill of Human Rights and the fundamental conventions of the International Labour Organization (ILO).

If the laws of a country where it operates conflict with these international standards, EDF endeavours to find a solution to allow it to comply with both the spirit of the international standards and national laws.

To ensure that human rights and fundamental freedoms are respected in its operations, EDF has implemented a vigilance approach to identify, assess and prevent any potential infringement of human rights or fundamental freedoms. The vigilance approach has been designed to comply with the French law on the duty of care and is based on the recommendations of the UN Guiding Principles on Business and Human Rights.

The EDF group pays special attention to the impact of its operations on individuals recognised as vulnerable under international human rights law and investigates, in complete transparency, impartiality and good faith, any alleged infringements of human rights or fundamental freedoms connected to the operations of the Group's entities, providers and subcontractors.

If an infringement of human rights or fundamental freedoms is proven in the operations of the Group's entities or suppliers or subcontractors, EDF has agreed to engage in dialogue with the victims and/or their representatives to address the situation.

3.3.2.3.2 Rights of staff

The EDF group is committed to the human rights and fundamental freedoms of its staff and complies, as a minimum, with the provisions of the standards published by the International Labour Organization (ILO).

In terms of the prevention of discrimination, the EDF group guarantees equal treatment for its employees and is against any form of distinction, exclusion or preference, whether based on presumed race, skin colour, sex, age, religion, political beliefs, national origin, social origin, disability, family status, sexual orientation or gender identity. In the countries where it operates and for its own operations, the EDF group actively promotes equality in the workplace and equal treatment for equal work for the women and men working for the Group and strives to achieve balanced work teams at all levels of the Company. Diversity is encouraged at all staffing levels and employees must be protected from all forms of discrimination or retaliation.

The EDF group does not tolerate any form of harassment or violence, whether within or outside the workplace, relating to the working relationships established in the workplace. The Group is committed to preventing and protecting its employees from all forms of harassment, sexism and violence in the workplace.

The EDF group is against all types of forced labour, as defined in the ILO fundamental conventions. In particular, for the projects and operations implemented by the Group, it ensures that all employees have given their free, informed consent for the performance of all their duties. In particular, the EDF group ensures that its intermediaries and recruitment agencies do not use any practices that could result in forced labour. The Group is committed to protecting the free movement of workers and, in particular, will not confiscate the travel documents, identity papers or any other personal belongings of workers in any circumstances whatsoever.

The EDF group is against all types of child labour, as defined in the ILO fundamental conventions. The Group commits to not employ anyone under the age of 15 (subject to the exceptions set out in ILO Convention 138) or anyone under the age of 18 years for work considered dangerous as provided for in the ILO convention.

The EDF group respects an individual's right to freedom of association and the right to collective bargaining as defined by the ILO. The Group recognises that all employees are free to form and/or join the workers' organisation of their choice and will not interfere with that right. The EDF group will not tolerate any intimidation, harassment, sanction or discrimination against an employee due to union activities and does not discourage employees from joining the organisations of their choice. The Group respects the right to collective bargaining and the role of workers' organisations in the collective bargaining process.

(1) With the exception of RTE, transmission network operator, and Enedis, subsidiaries independently managed within the meaning of the Energy Code.

The EDF group complies with the ILO standards and all applicable laws and regulations governing working time, based on the following principles, subject to the exceptions approved by the ILO:

- regular working weeks should not exceed 48 hours;
- working weeks are limited to 60 hours, including overtime;
- workers should have at least one day off for every seven days worked, except in emergencies or unusual situations;
- workers should have at least three weeks of paid leave for a full year of service;
- workers are entitled to at least 14 weeks of maternity leave.

The EDF group strives to comply with the ILO standards on pay, working conditions and benefits. The Group is committed to paying a living wage, covering the basic needs of its employees and their families, and to providing adequate social security cover for all its employees. When employee accommodation is provided by the Company, the EDF group ensures that decent housing or accommodation is provided in compliance with the ILO standards.

In 2018, EDF signed a new global agreement on the Group's Corporate Social Responsibility with two international trade union federations (IndustriAll and ISP) and all of the EDF group's own trade unions. This agreement automatically applies to all the Group's employees and effectively reflects its commitment to "make upholding human rights a prerequisite to all its business activities, and not to tolerate any violation of these rights whatsoever, whether during the course of its business, or by its suppliers, subcontractors and partners". It confirms that, in the event of conflicting standards with applicable laws in countries in which it operates, the EDF group undertakes to apply the most protective human rights provisions while complying with the national laws. All controlled subsidiaries of the EDF group have now been informed of the agreement and are developing a social progress action plan.

3.3.2.3.3 Rights of local communities

The EDF group is committed to protecting the rights of the local communities affected by its operations and arranging, systematically and worldwide, transparent, debated discussions and consultations for each new project.

The Group recognises the role of human rights and environmental activists. It is committed to protecting the exercise of their rights and ensures that it identifies the risks to human rights and environmental activists caused by its business operations and allows them to speak freely about its operations.

The EDF group identifies, for each project, the potential impact on the health, living conditions and environment of local communities, with reference to the performance standards of the International Finance Corporation (World Bank Group) and proposes suitable measures.

EDF is committed to respecting the specific characteristics and rights of indigenous peoples as defined in the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and ILO Convention 169, which provides, in particular, that "indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation".

Whenever its operations threaten or affect the livelihood of a community, the Group implements compensation and/or restoration measures for their livelihood matching or exceeding the level prior to its operations.

The EDF group is committed to respecting and protecting or safeguarding, in agreement with the populations concerned, any expressions of their culture, religion or heritage present on the land used for its operations.

In terms of the use of security forces, the Group is committed to protecting the safety of its employees and sites in strict compliance with human rights, including those of local communities, and only authorises the use of force for preventive or defensive purposes in a manner proportionate to the nature and severity of the threat.

3.3.2.3.4 Implementation of human rights commitments

Human rights commitments are implemented as part of the Group's CSR commitments and requirements [1], based on the principles of action that apply to all Group operations, such as:

- screening, initial and ongoing, and management of environmental and societal impacts and risks, including those caused by operations under its business relationships;
- organisation, throughout the world, of transparent, debated discussions and consultations for each project;
- the implementation and monitoring of these commitments and requirements is ensured under the Group's existing internal policies or agreements, in particular the sustainable development policy, the ethics and compliance policy, the purchasing policy, the health and safety policy, the global CSR agreement, the Ethics Charter and the roll-out of the vigilance plan;
- systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff), have also been set up.

EDF strives to implement its commitments in the early stages of its investment processes, including in its business relationships by requiring its suppliers and subcontractors to comply with CSR requirements for operations related to their joint business relationships.

This ensures that human rights aspects are systematically addressed in the analysis of projects presented to the Commitments Committee of the Group Executive Committee and also to the committee that validates the Group's international development projects, the International Business Development Committee. It involves identifying human rights risks associated with the projects, such as aspects related to workers' rights and health and safety conditions for the populations concerned, to ensure that EDF's commitments in this area are taken into account.

In terms of purchasing, the Group Purchasing Department's CSR risk mapping has included an analysis of "human rights" risks for each purchasing segment since 2019, to determine the level of residual risk and identify the action to be taken with suppliers (see section 3.4.2.3.2 "Responsible procurement strategy and practices"). For fuels, see section 3.4.2.3.3 "Coal and uranium supply chain".

The "human rights in business" e-learning module developed with the association Entreprises pour les droits de l'homme (*i.e.* Businesses for human rights), of which EDF is a founding member, has been updated to include the duty of care and is available to all employees.

Performance indicators are monitored at the Group level, based on Cap 2030, *via* the Health & Safety Policy (see section 3.3.1.3 "Health and safety of employees and subcontractors"), Let's Talk Energy programme, employee commitment surveys and supplier relations (evaluations, supplier focus survey).

3.3.2.4 Whistleblowing system

In 2018, the EDF Executive Committee decided to upgrade its system to secure the handling of reported wrongdoing and increase personal data confidentiality and security.

3.3.2.4.1 Scope

The Executive Committee decided to set up a single whistleblowing system for all wrongdoing reported under the Sapin II Law and the law on "duty of care" as well as wrongdoing reported by employees alleging harassment and discrimination. The Group Ethics and Compliance Department is the Group point of contact for the system. This Group system benefits all Group entities, except for the subsidiaries in the regulated sector, Enedis and RTE [2], which have their own whistleblowing system to respect their managerial independence. Whistleblowers may choose to use the Group whistleblowing system or the other channels available to them (manager, human resources, staff representatives, local ethics and compliance officers, mediators, etc.).

(1) EDF SA and the companies it controls. Control is established, in particular, if EDF holds, directly or indirectly, a majority of the share capital or the voting rights within the governing bodies of the relevant companies. Excluding RTE and Enedis, which are independently managed subsidiaries within the meaning of the provisions of the Energy Code.

(2) Distribution network operator Enedis and transmission operator RTE are managed independently.

3.3.2.4.2 Accessibility of the system

The Group whistleblowing system, managed from an independent platform that is not connected to EDF's IS, may be accessed at any time *via* the EDF group website. The interface is available in several languages (French, English, Italian, Portuguese, Dutch and Mandarin) in France and abroad, and the whistleblower can report wrongdoing in the language of their choosing [(1)].

3.3.2.4.3 Reporting wrongdoing

The EDF group ethics and compliance whistleblowing system allows Group employees and external staff (temporary workers, service provider employees, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.), as well as third parties, to report wrongdoing of which the EDF group or its employees are the culprits or victims.

3.3.2.4.4 Analysis of the admissibility of reports

Once the report has been submitted, whistleblowers receive confirmation within 72 hours informing them that the admissibility assessment has begun. Whistleblowers can submit reports anonymously in countries where this is authorised. Wrongdoing can be reported anonymously, as long as the severity of the reported facts is established and the factual elements are provided in precise and sufficient detail, so as to provide evidence for the reality of the reported facts.

The Group Ethics and Compliance Department assesses the admissibility of the report, which depends on the scope of application and the whistleblower's relationship with the Company. This admissibility is independent of whether the alleged facts are well-founded or not, which can only be determined through a report handling process. Once a ruling has been made on admissibility, the whistleblower is informed of the protective measures from which they benefit (protection under the Sapin II law, French Labour Code, etc.). These vary according to their status (victim or witness, individual or corporation, etc.), their relationship with the Company (employee, external service provider, third party, etc.) and the themes involved (fraud, harassment, serious environmental damage, etc.).

3.3.2.4.5 Processing of admissible reports

Each report that is deemed admissible is processed. The Group Ethics and Compliance Department appoints a case manager and, if necessary, is assisted by Ethics and Compliance Officers and other experts to handle reports. When the investigations have been completed, an investigation report is drawn up by the case manager. If the allegations reported are proven or partially proven, an action plan is implemented. The Group Ethics and Compliance Department monitors the progress of this action plan and ensures it has been fully implemented before the report is closed.

3.3.2.4.6 2020 Results

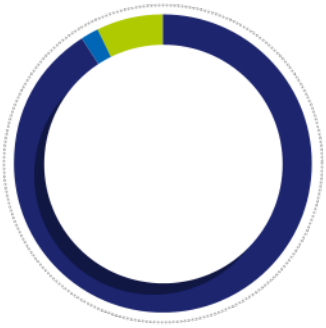
Whistleblowing results are consolidated and included in the annual ethics & compliance report submitted to the Executive Committee and presented to the EDF Board of Directors' Governance & Corporate Responsibility Committee. For 2020, the Group Ethics and Compliance Department has consolidated all admissible reports submitted within the Group (*via* the Group system or any other channel). 184 admissible reports were recorded (including 39 *via* the Group whistleblowing system). 95 were about incidents occurring in France and 89 abroad; 97 related to EDF and 87 to Group subsidiaries. Most whistleblowing (40%) relates to harassment/discrimination. In 2020, 58% of the whistleblowing reports handled were sufficiently substantiated to result in corrective action or disciplinary action, including the dismissal of a Group executive manager following an established report of harassment. It should be noted that in 43% of the cases where the facts were not proven, action to improve the relevant processes was still taken.

Admissibility of reports in the Group's whistleblowing system

Admissibility of reports in the Group's whistleblowing system

49%	Admissible reports
1%	Under analysis
50%	Non-admissible reports

Relationship of whistleblowers with the Group (all channels combined)



91%	Employees
2%	Other third parties
7%	External staff

Results of investigations following alerts (all channels combined)

42%	Unproven allegations
37%	Proven allegations
21%	Partially proven allegations

Actions taken following alerts (all channels combined)

72%	Corrective
13%	Disciplinary + corrective
13%	Disciplinary
2%	Legal

(1) www.edf.fr/edf/alerte-ethique.

3.3.3 Equality, diversity and inclusion [1]

In keeping with its responsibility to promote equality, respect for diversity and inclusive values, the EDF group is committed to developing concrete action to promote equality in the workplace and occupational and social integration for disabled people, combating sexism, violence and all forms of discrimination and developing support for parents. As a socially responsible employer, the Group is committed to maintaining and perfecting a high level of social dialogue and strives to secure the skills required for the Group's business lines over the long term, by integrating all aspects of sustainable development into its operations and projects and giving employees an opportunity to develop their employability throughout their careers.

3.3.3.1 Workplace equality

Through the CSR goals, the global CSR agreement and its code of ethics, the EDF group takes concrete action, measures the progress made and sets targets for gender equality in the workplace.

2020 was marked by:

- the adoption of the Ambition Mixité (destination diversity) plan, mainly designed to increase the number of women sitting on Management Committees and the number of female executives in the Group. By the end of 2020, 25.8% of the Group's employees were women and 28.7% of Management Committee members were women (target of 28% by 2023);
- the publication of a gender equality index showing a good level for EDF and most of the Group's subsidiaries, with a score of 95 points out of 100 for EDF (95 points in 2019);
- in-depth work on equal pay for women and men, conducted in partnership with the Institut national des études démographiques (National Institute for Demographic Studies or INED), to identify the sources of the gender pay gap, with a particular focus in 2019 on the impact of additional pay components (on-call pay, overtime, additional hours, seniority bonuses, etc.). In particular, the situation was analysed at the divisional level, to examine the gaps based on the business line environments and the characteristics of more homogeneous groups;
- continuation of the revised support systems for parents and family carers, under the "Family Rights" agreement signed in the Electricity and Gas Industries (EGI) branch. Some rights have been improved, to take into account the position of single-parent families and parents of disabled children;
- use of awareness-raising/training tools and measures to prevent and combat sexist behaviour and the risk of bullying and sexual harassment for all target groups (management, HR, staff representatives, medical and social teams and employees);
- operational implementation of support, awareness-raising and assistance measures for employees who are victims of domestic or family violence, in partnership with the Company's medical and social teams and the *FIT, une femme un toit* association in particular. More than 140 victims were assisted under this scheme in 2019;
- as a result of the impact of the Covid health crisis, including on the 2020 social agenda, the management and all social partners have agreed that the Workplace Equality agreement should be extended at EDF for one year. The agreement is now a unanimous agreement;
- signature of a GEEIS [2]-IA commitment charter on the use of inclusive artificial intelligence without gender stereotypes in all business processes and environments.

Since 2014, the EDF group and some of its subsidiaries have decided to apply for an international certification (GEEIS certification, renewable every four years) to assess the quality and relevance of their commitments to gender diversity and equality in the workplace. The certification was successfully renewed in 2019 and, for the very first time, it was extended to all the Group's other fields of action in terms of diversity and inclusion. In France, the equal pay aspect is now shown through the new gender equality index, which is compulsory for all companies with more than 50 employees.

3.3.3.1.1 The Group's commitment

In 2019, EDF's Executive Committee decided to strengthen the Company's gender diversity goals by implementing them at the Group level for the very first time, with the aim of setting an industry benchmark. This Group gender diversity goal is based on three commitments.

Breaking the glass ceiling right up to the top levels of responsibility and governance of the Group, and reaching the following targets:

- 28% of Management Committee members should be women by 2023 (Group wide);
- 28% of executives and future executives should be women by 2030, increased to 30% in 2021;
- 40% of directors appointed by EDF to the boards of directors of Group companies should be women by 2023.

Developing gender diversity in science, digital technology and innovation, mainly by:

- continuing to increase awareness among young women of scientific, technical and digital careers;
- encouraging more women to take up careers in the digital professions;
- improving the integration of gender diversity in the Group's innovation systems (EDF Pulse, "*Parlons Énergie*" (Let's talk about energy), Project Y, etc.).

Developing gender diversity in internal and external representation of the Group, mainly by:

- encouraging women to take part in the Group's public interventions (EDF is a signatory of the #jamaissanselle charter);
- ensuring gender fair communication, meaning non-sexist and with an equal gender balance.

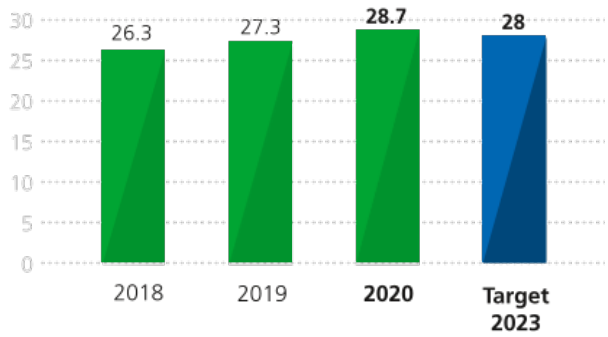
3.3.3.1.2 Measuring progress

Key performance indicator

The key indicator used by the Group for gender diversity is the percentage of women members of the Management Committees of Group entities.

The percentage of women sitting on Management Committees stood at 28.7% in 2020, meaning that the target was exceeded two years early, also in line with the percentage of female managers in the Group in 2020 (28.8%).

Gender balance index: percentage of women in the Management Committees of the Group's entities (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

(1) Social dialogue is related to these types of issues, but this is explained in the "CSR governance" section, in section 3.5.2.5 "Social dialogue".

(2) Gender Equality European and International Standard: EDF holds the international GEEIS certification, in collaboration with the Arborus fund, as certified by Bureau Veritas. This certification assesses the workplace equality programmes of three Group companies (EDF in the UK, Fenice and EDF SA) and the Group itself.

This trend is set to continue, as the percentage of women in the Group's workforce has continued to increase at a fairly steady pace, reaching 25.8% at the end of 2020 (+1 point/2019). Likewise, in December 2020, the Board of Directors adopted a gender balance policy for management bodies, implementing the goals of the "*Ambition Mixité*" (destination diversity) plan for EDF SA, setting as a target that 30% of executives and future executives should be women by 2025 (see section 4.2.1 "Composition of the Board of Directors").

Other results of Group entities based on the gender equality index [1]

	Unit	2018	2019	2020
Male workforce √	Number	124,889	123,815	122,578
Female workforce √	Number	40,901	40,912	42,622
Male managers	Number	37,888	38,097	38,084
Female managers	Number	14,478	14,999	15,401
Percentage of women at managerial level*	%	35%	37%	36.1%

** This percentage represents the number of women in managerial positions/the number of female employees.*

√ 2020 indicator subject to reasonable assurance check by KPMG SA.

25% of the EDF group's workforce is currently female (30.4% at EDF), which places it in the top half of the main French industrial groups. Although the increase in this rate has slowed slightly in recent years (impact of the "15 years, 3 children" measure, reduction in the number of new hires, now mainly needed in technical professions), it is still increasing at double the average rate recorded for French companies, for all sectors combined [2].

Even if the number of women in technical professions has tripled since 2002, the Company remains committed, as part of the Group's Ambition Mixité (destination diversity) plan, to ensuring that:

- each relevant entity develops a programme to include young women in STEMs (Science, Technology, Engineering, Mathematics);
- more and more women are supported each year in training for digital professions (ex: gender parity in the data analyst training);
- each innovation scheme set up by the Group or its entities has a gender diversity component and provides the resources to achieve it.

EDF strives to guarantee equal access to professional and promotional training, through, for example, a scheme to cover additional childcare costs for parents undergoing training, with a view to securing comparable career paths for women and men.

Steady progress has been made in recent years with its attempts to break the "glass ceiling" effect:

- the number of female managers has doubled at EDF since 2002;
- 28.1% of the most senior positions at EDF (top 10%) are held by women;
- 32% of EDF managers are women;
- 28.7% of Management Committee members are women at the Group level.

For executive positions, succession plans always include male and female candidates. In addition, schemes (such as TALENTS 2.0) help identify a more diverse range of talent, at all stages of the career path.

3.3.3.2 Combating sexism and violence

EDF was the first company to obtain the "sexiste, pas notre genre" anti-sexism certification in 2016, constituting a recognition by the French government of its commitment. With the support of the "Énergie de Femmes" network (almost 4,000 members), the Company provides training and increases awareness on these subjects through various tools:

- "sexism kits" to help managers lead the ritual health and safety briefings at the beginning of team meetings;
- Guidelines on bullying and sexual harassment targeted at managers and HR or the "sexist behaviour and sexual harassment" officers, used since 2019;
- employee information kits on the same subjects, available in a digital or printable format;
- a toll-free hotline for all employees of the Company, operating seven days a week, to allow employees to confide in someone and obtain advice on harassment and discrimination issues;
- an e-learning course on the prevention of sexism, available on e-Campus for all Group employees in France;
- a range of services, combining internal support and the use of listed experts, helping managers to increase awareness among their employees or conduct investigations following reports of wrongdoing within their scope.

With its Workplace Equality Game, EDF is the first company in France to develop a learning experience on workplace equality for managers, inspired by escape games. It supplements a digital training tool called "Vivre ensemble la diversité" (experiencing diversity together) available to all employees and managers, designed as a serious game, which trains teams on potential bias and the potential impacts of stereotypes in their decision-making and inter-professional relations (including issues of everyday sexism and gender-based discrimination).

EDF is also committed to preventing and combating all forms of violence against women, in the workplace (sexism, harassment) and also domestic and family violence (support, guidance and job retention). A pioneer in this area, EDF's efforts have received regular recognition over the past few months and were also emphasised at the most recent Grenelle summit on violence against women run by the Government. Through these schemes, EDF has helped, assisted, supported and guided 120 employees who were victims of domestic violence over 2020.

3.3.3.3 Parenting support measures

EDF strengthened its parenting support measures in 2019, mainly by:

- implementing new rights for family carers (access to a platform of advice and services, additional pay for carer's leave, etc.);
- creating a parental leave scheme available to both women and men that takes into account the different types of contemporary families;
- giving parents the option to double their paternity and childcare leave.

These measures were further strengthened in 2020 by a supplemental agreement to the branch-level collective bargaining agreement governing the family rights of employees, mainly to take into account the special position of single-parent families and the specific needs of parents of disabled children.

(1) The methodology associated with this data is explained in section 3.7.2.3 "Further details on other environmental, social and societal data included in the non-financial performance statement".

(2) Source: DARES.

3.3.3.4 Disability plan

A long-term disability plan

EDF was one of the first large French companies involved in the occupational and social integration of disabled people.

In October 1989, EDF signed its first agreement to facilitate the occupational integration of disabled people. The 11th EDF agreement for equal rights and equal opportunity and the occupational integration of disabled people was signed on 13 December 2018 for the 2019-2022 period.

In 2020, several Group companies (Enedis, Framatome) began negotiations to renew their agreements for the 2021-2023 period.

In terms of sports, its goal is to encourage sports for all. In 1992, EDF became a partner of the Fédération française handisport (French Federation of Disability Sports). EDF is also a partner of the 2024 Paralympic Games.

	Unit	2018	2019	2020
Number of employees with disabilities*	Number	5,640	5,682	5,826

* *The methodology associated with this data is explained in section 3.7.2.3 "Further details on social, environmental and societal data from the Statement of non-financial performance".*

Steady improvement

EDF pays close attention to the integration of disabled employees throughout their careers. Through EDF's disability plan, a range of tools has been implemented for employees and managers and special training courses to support, roll out and facilitate this policy.

Group companies in France were involved in the National Disability Employment Week. As part of this, EDF set up two digital disability passports for employees and managers.

In 2020, EDF in the United Kingdom became a signatory of "The Valuable 500" [(1)] initiative, getting the executives of large companies involved in the employment of disabled people.

In addition to adapting workstations to meet the specific needs of employees, several Group companies in France have introduced schemes, as part of their disability agreements, to provide them with occasional, back-up aid to offset the challenges they face in the workplace. Applications for aid are examined anonymously, in a multidisciplinary framework.

As part of their approved agreements, several Group companies in France have also introduced measures to facilitate the continued employment of disabled employees during the second half or at the end of their careers.

Constantly changing issues

The Group's commitment to the occupational integration of disabled people is a long-term commitment, but the issues to be addressed are constantly changing. For example:

- the issue of digital technology, a priority under EDF's most recent disability agreements (e-learning "digital accessibility at all stages of a project");
- offsetting the effects of mental disability in the workplace.

Action in the field of purchasing from companies employing disabled workers only

In autumn 2020, Enedis, in partnership with GESAT, launched a "digital regional tour" to provide highly operational support to its units in their efforts to develop purchasing from companies who employ disabled people only ("*Secteur du Travail Protégé et Adapté*" or STPA) to contribute to the employment of disabled people in the regions. In spring 2020, EDF SA renewed its internal instructions to facilitate purchasing from such companies.

3.3.3.5 A clear framework for preventing discrimination

Preventing, supporting and guaranteeing respect for different sexual orientations in the workplace

The Group has adopted a code of ethics based on three main values: respect, solidarity and responsibility. Through these values, all employees should feel at ease in the workplace, regardless of their sexual orientation. It is the role of the management team to prevent any situation that violates the law (any homophobic discrimination, harassment, comments or demonstrations).

In that spirit, EDF provided its HR staff and managers with guidelines in 2015 on "Respect for sexual orientations in the workplace", which was also one of the first guides in France to be directly inspired by situations in the workplace (case studies). EDF is a partner of *L'Autre Cercle* [(2)] and has been a signatory of the LGBT charter since 2015. It has also partnered and supported the Energay association [(3)] since 2010. EDF has also designed, in partnership with Energay, a process to accompany and support transitioning employees within the Group. "Supporting transitioning employees at EDF – Respect for gender identity" guidelines were published in 2019, aimed at managers and HR staff.

Religion in the workplace, a shared framework

EDF is convinced that it will perform better if its employees feel respected, including respect for their personal beliefs, as this will allow them to fully commit to their work teams. The EDF group has been committed to respecting religion in the workplace since 2008, and published a first set of guidelines in 2010 (updated in 2016), setting out guidelines for managers and HR officers to help them understand, analyse and act in compliance with the law. All of these guidelines are designed to prevent discrimination and facilitate the creation of a respectful working environment, that improves team cohesion and the Group's performance. The guidelines produced "Religion in the workplace" is now a benchmark and are directly inspired by situations in the workplace (case studies).

Freely available materials

To support and implement these policies of inclusion and equal opportunity, EDF has gradually produced educational and training materials for its entire workforce, whilst still providing managers and HR staff with more targeted materials. For example, in 2018, Enedis [(4)] published a set of guidelines called "Deciding without discrimination" aimed at its managers and HR staff.

To raise employee awareness of diversity and encourage new inclusive practices and methods of organisation, the Group has launched a digital training programme called "Together in Diversity" based on a serious game mechanism. EDF SA, for example, has made the commitment to use that programme to train its managers.

It also trains everyone involved in its recruitment process, using a digital training course that includes a specific module on how to "recruit without discrimination". EDF also provides awareness-raising materials in short, fun formats to allow employees to take action to create a caring, respectful and inclusive environment. For example: "Sexism, not our thing" anti-sexism kits to be used as part of the systematic Health and Safety ritual at the beginning of each team meeting; three Serious Games, developed in partnership with the *Conservatoire National des Arts et Métiers Pays de la Loire* covering intergenerational issues, gender equality in the workplace and cultural diversity.

(1) thevaluable500.com/

(2) *L'Autre Cercle* is an LGBT (Lesbian Gay Bi and Trans) association combating discrimination in the workplace.www.autrecercle.org

(3) Energay is the LGBT association for the electric and gas industries and their friends. www.energay.org Network operator, independently managed.

(4) Network operator, independently managed.

3.3.3.6 Skills development

3.3.3.6.1 The Group's commitment

Skills development is an investment in human capital

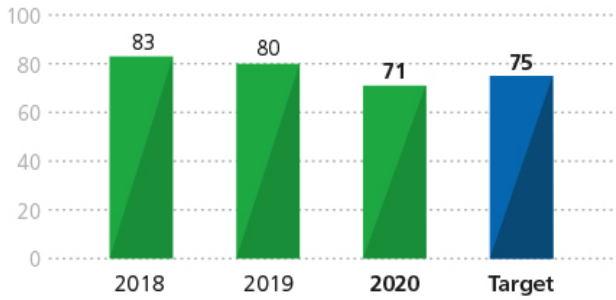
2020 marked the roll-out and effective implementation of the new [1] skills development policy signed in 2019. Rolled out in the Group's companies in France, it specifies and coordinates investment in the changing needs for skills, in line with the CAP 2030 corporate strategic framework.

This policy is designed to boost the transformation of training and professional development practices at a time of rapid changes. It aims to secure the skills needed by the Group's business lines over the long term, by giving employees an opportunity to develop their employability throughout their careers. It implements a shift from training and employment management to skills management, helping to improve the employability of employees.

Percentage of employees who have taken part in a skills development initiative

This figure has been disrupted this year by the effects of the health crisis. Despite a drop of almost 30% in the number of skills development hours completed this year, the Group maintained access to training and professional development for the vast majority of its employees. In addition, the number of employees who have not taken part in any skills development initiatives over the past three years has also continued to fall by almost 10%, confirming that this access has been maintained overall, despite the context.

Percentage of employees who have taken part in a skills development initiative (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

Investment in skills development

Skills development expenditure for the entire Group stood at €484.9 million in 2020 (*i.e.* €2,935 per employee in the workforce). The particular situation caused by the health crisis had a significant impact, reducing the use of face-to-face training.

		2018	2019	2020
Total number of skills development hours	Number	7,629,101	6,820,423	4,735,240
Number of skills development hours per employee in the workforce	Number	47	41	29
Number of employees who have taken part in a skills development initiative	Number	138,131	131,992	117,341
Number of employees who have not taken part in a skills development initiative for 3 or more years	Number	6,023	6,527	5,907

A rapid adaptation to the constraints generated by the health crisis was made possible through the efforts [2] of the Group's training staff, shared guidelines and the involvement of external providers. The proportion of remote learning rose sharply to reach 22% of all skill development hours in 2020.

Re-engineering, digitalisation and adaptation of courses

2020 was marked by major overhauls of training systems, such as:

- the redesign of major courses and strategic courses within the production field, such as "nuclear culture", thanks to a hackathon of re-engineering;
- the training of work-study tutors, transformed in less than a week.

New direction and shift in practices

The implementation of the new policy also accelerated the work to establish the conditions for a "learning organisation", through diagnostic tools and a more precise use of data from training evaluations. In addition, the use of Work-Based Training Initiatives (action de formation en situation de travail or AFEST) as a practice for employee professional development, as part of daily production operations, aims to consolidate the skills and knowledge acquired. A Knowledge Management approach has been structured for a rapid roll-out within the nuclear industry.

3.3.3.6.2 Employees actively involved in their career

The aim is to implement a shift from training and employment management to skills management.

- the improvement of the employee "user path" continues. By streamlining the catalogue range by 37% over the last two years, EDF has continued its efforts to improve the accessibility and intelligibility of the available training. The first steps have been taken for a marketing of the range, through the new training module of the "MyHR" HR IS, and this approach allows the expressed needs to be matched with the corresponding available training;
- the accessibility of the training has also been enhanced by the roll-out of a range of remote training courses, in particular in cross-disciplinary skills (languages, office automation, quality of written documents, oral communication, professional posture, personal development and quality) through special digital platforms. They are gradually being rolled out to cover most of the themes offered and are intended for all business lines and subsidiaries;
- lastly, the internal "ecampus" platform continues to be developed (and *via* this platform, access to special digital training from partners). 96,600 employees used e-campus for training in 2020 and 40,000 Group employees attended the three corporate campuses (Saclay, Lyon and Chatou).

(1) This affects subsidiaries whose registered office is in France, employing more than 50 employees.
(2) Common base of instructions, processes and operating procedures.

3.3.3.6.3 Group talent management

The Talents policy, implemented at the level of the EDF group, describes the principles and criteria for identifying and validating employees with the potential, in the long and short term, for executive level responsibilities while respecting the management independence of network managers. Under this policy, high-potential employees should be identified at an early stage to prepare them and monitor them in the long term, with a high level of involvement from all executives at various stages. Regular assessments (junior/senior) are conducted to detect the talent and future leaders of tomorrow. These assessments are conducted using a unique leadership model, overhauled in 2019 and currently being rolled out in all Group entities and companies. Since 2018, the Talents 2.0 programme has supplemented the process used to detect new talent. Employees can identify themselves directly through a series of online tests which then lead to an assessment.

3.3.3.6.4 Improving the "social elevator" and internal mobility

The Group continues to roll out and enhance the various components of its commitment to internal promotion and mobility, through the richness and diversity of its career paths. This is achieved by providing relevant information at the various stages of an employee's career (for example, mobility e-forums, open to all employees, which showcase regional opportunities for jobs and mobility), support for moving up to the next professional category (mainly the transition to management positions) and not forgetting the efforts to promote work-study programmes and promotional training courses (including promotional training courses leading to qualifications). There was a sharp increase in the number of such courses in 2020, leading to the highest number of graduates in the last 5 years (137 for EDF SA).

The Company's aim is to further promote retraining through work-study training schemes, to allow a wide range of career paths to be taken, even in difficult, uncertain contexts. Studies are being conducted on new courses (accountancy, HR regulatory support, IT operations manager, management controller, product owner). Following on from the success of the re-training scheme already implemented for data analysts, EDF is adapting this type of scheme to develop new courses in other hard-to-fill areas: nuclear engineering planners, procurement officers and boilerwork and plumbing managers, while continuing to develop new data analyst courses. See also section 3.4.3.2 "Redeployment and individual support".

3.3.3.6.5 Support for the Group's executives and managers: the Group Management University (GMU)

The GMU was created in 2010 to support the development of EDF group managers and executives throughout their careers. Acting at the very heart of the transformations, the GMU develops managerial training schemes, prepares the "Group Talent" for executive responsibilities and ensures the professionalisation and development of the executives in office through a specially adapted curriculum. The GMU designs and provides programmes and training courses that help create and disseminate a common culture at the Group level based on EDF's historical know-how and skills, and innovative practices in the field of management and leadership. The GMU is also developing partnerships with the best academic institutions worldwide, selected following tenders. The GMU's programmes combine a demand for quality and openness to change with a capacity to adapt to the Company's internal challenges. The GMU is responsible for implementing the model of leadership skills within the Company, multiplying its deployment through its training programmes so as to encourage a shared, rapid appropriation of the main issues to pave the way for the future.

3.3.3.6.6 Skills development in the area of sustainable development

In line with the Company's training policy, there are many training courses available for employees and managers and also executives and directors on sustainable development issues. For example, the "Strategic energy business" training for executives, the "Business and sustainable development" module for new Group directors and also completely digital [1] courses such as "Management and sustainable development" or "Relations with the Group's stakeholders" available for all managers and executives. Skills relating to low-carbon electricity generation and the safety of facilities are maintained and developed through the training programmes for business lines and employee on-boarding programmes.

For the extensive roll-out of the "Climate Collage", see also section 3.1.3.5.2 "Innovation and collective intelligence". In terms of biodiversity, the "Biodiversity Collage" was launched in the last quarter of 2020 (see section 3.2.1.5.3 "Raising awareness among the general public").

3.3.3.6.7 Developing a culture of innovation: the EDF Pulse ecosystem

The Company wishes to develop a culture of innovation. The aim is to support the transformation of the Company and its work organisations in keeping with the Company's performance needs, employee expectations and societal developments.

The innovation ecosystem is shaped around the "EDF Pulse" brand, to cover all aspects. This brand is driven by employees and supported by special partners in each unit *via* calls for ideas and support schemes: networking through the creation of thematic discussion groups across the Group. It is particularly focused on accelerating and implementing high-impact projects *via* the creation of an incubator for internal start-ups called EDF Pulse Croissance, which has already launched subsidiaries such as Urbanomy [2] and Exaion [3].

This scheme is enriched by external collaborations with the academic world, start-ups (8,000 start-ups listed and more than 300 under contract), investment funds (around fifteen partnerships) and exchanges with peers from other companies through special networks. It is recognised at the Group level by the annual in-house EDF Pulse awards, rewarding innovative projects developed by teams of employees in the Group based on topics such as low-carbon generation and the transformation of the Group.

3.3.4 Energy poverty and social innovation

The various problems due to access to energy and energy poverty keep intensifying in most developed countries, in terms of the number of households concerned or the severity of the impacts encountered. It is for this reason that EDF confirms and renews its commitment to its most vulnerable customers, by increasing the understanding of this diverse, complex reality, implementing support solutions based on public solidarity schemes and specific initiatives and developing various forms of social innovation and sponsorship through its Foundation.

3.3.4.1 Knowledge and understanding of vulnerability

The problems due to access to energy and energy poverty keep intensifying in most developed countries, in terms of the number of households concerned or the severity of the impacts encountered. Vulnerability varies according to geographical location, income, and size and type of accommodation, as well as the type of energy used. And its measurement is complex and varies from one country to another. In France, the French National Energy Poverty Observatory, of which EDF is a partner, published its indicator [4], revealing that 3.3 million households were in a situation of energy poverty.

(1) Available on the "ecampusmanagers" platform.

(2) Urbanomy is a new start-up incubated by EDF Pulse Croissance, which provides a range of energy and urban planning consultancy services making people the main focus of towns and cities again. The start-up helps both private and public-sector stakeholders to design sustainable, resilient urban spaces.

(3) Exaion is a cloud provider of blockchain and supercomputing solutions.

(4) French National Energy Poverty Observatory 2019 dashboard (Energy poverty quantification indicators).

In the United Kingdom, the indicator published by the public authorities showed the country had 2.5 households in a situation of energy poverty. In Italy and Belgium, there is currently neither a definition nor an indicator relating to energy poverty.

In these very different national contexts in regulatory, economic, political, and competitive terms, the EDF group is committed to the fight against energy poverty alongside public [1] and social organisations and associations.

All European stakeholders have seen the significant impact of the effects of the health crisis on customers, whose situations have worsened. Households in a situation of energy poverty have been particularly affected by the drop in earned income and some have also been affected by delays with and postponements to housing improvement works. The number of customers in financial difficulty is expected to increase. Feedback on the impact of the crisis is regularly provided by EDF R&D.

EDF R&D runs an "Energy poverty: understand-innovate" programme to anticipate the changes in energy poverty and public policies and to design and develop innovations allowing to fight against energy poverty more efficiently. Contextual studies and prospective reflections of researchers allow this multidisciplinary team (sociology, engineering, economics, computer science, design, ergonomics, statistics) to nurture the three areas of actions (payment assistance, support, prevention) of EDF's solidarity policy. In France, EDF was involved in the work of the National Fuel Poverty Monitoring Centre.

The Group has long been acting to ensure that an electricity bill is not an additional aggravating factor for its most vulnerable customers and gives priority to supporting them. EDF's action is materialised into research programmes, innovation and the implementation of practical solutions, consisting of enhanced support for public measures and EDF group-specific actions.

3.3.4.2 Enhanced support for public solidarity schemes and specific action taken by the Group during the health crisis

3.3.4.2.1 Enhanced support for public schemes by the EDF group to promote access and improve efficiency

The EDF group implements public schemes by adding its own strong support systems for vulnerable populations.

In France

Among the many prevention initiatives developed, EDF has been involved in the "*Habiter Mieux*" (better living) programme run by the *Agence nationale de l'habitat* (French Agency for Home Improvement or Anah) since 2011. To date, more than 503,000 housing units occupied by vulnerable households have been renovated under this programme. EDF also supports the "*Toits d'abord*" (a roof first) programme with the Abbé Pierre Foundation and contributed €6.3 million over the 2018-2020 period. The programme focuses on the construction and rehabilitation of housing occupied by very low-income households.

The "*Prime énergie EDF*" website offers financial assistance, based on a State-run scheme enhanced under the Stimulus Package, to carry out work to save energy. EDF has also run a new scheme called "*Mon chauffage durable*" (sustainable heating) since 2019, to help the poorest households reduce their energy bills and CO2 emissions by replacing fossil fuel boilers (oil-, gas- or coal-fired) with heat pumps. Under this scheme, the poorest households are awarded a €4,500 bonus for all quotes signed on or after 1 September 2020.

EDF Systèmes Énergétiques Insulaires (SEI) runs Demand Side Management (DSM) awareness and diagnosis initiatives for vulnerable households, such as on Reunion Island in partnership with the region through the SLIME programme (local intervention services for demand side management), coordinated by the French energy transition network (CLER).

In terms of payment assistance, EDF continued to promote the government energy vouchers programme in 2020 by:

- implementing relational marketing programmes when the government sends out the energy vouchers and as reminders at the beginning of the winter truce;
- running information campaigns targeting social workers *via* the efforts of solidarity officers and solidarity customer advisers;
- running outbound calling campaigns (and arranging for social conciliation structures to do the same during the Covid crisis from mid-April to mid-August) to assist customers in their efforts to obtain energy vouchers and submit them online;
- implementing specific initiatives to promote energy vouchers with its partners. The government sent energy vouchers to 5.7 million households in 2020, worth an average amount of €150;
- EDF Systèmes Energétiques Insulaires (SEI), ÉS (Électricité de Strasbourg) and the subsidiary Sowee are also developing information and advice schemes on the use of energy vouchers and demand side management.

Outside France

- In the UK, the Energy Carbon Obligation (ECO3), aimed at vulnerable customers and implemented by EDF Energy, encompasses both measures for reducing carbon emissions and fighting against fuel poverty through the improvement of energy efficiency. EDF also publicises the Warm Home Discount, in particular via its website. In addition, EDF in the UK is the only supplier to have taken the decision to help its customers access the Green Homes Grant, a new government fund that finances households via a voucher system for insulation and low-carbon heating systems. EDF had received over 12,000 applications by the end of September.
- In Italy, Edison is rolling out the "social bonus" scheme. This public scheme takes the form of a reduction applied to electricity bills, based on levels of income.
- In Belgium, Luminus developed all the public schemes that are very specific to Flanders, Wallonia and the Brussels Capital Region.

3.3.4.2.2 Specific and voluntary EDF group schemes

The detection of customers in financial difficulty is a difficult issue for all stakeholders. EDF and EDF SEI have taken action in this respect in liaison with their local partners. EDF is developing its modelling capacities to map energy poverty zones and propose solutions to local authorities.

EDF and its subsidiaries are developing voluntary schemes with residential customers in terms of payment plans, schedules and budget management support.

In France, EDF's customer advisers are informed about situations of energy poverty. In particular, they provide an "*Accompagnement Énergie*" (energy support) service for any customers in financial difficulty, designed to analyse the situation and propose the most appropriate solutions. The methodology associated with this indicator is explained in section 3.7.2.2 "Further details on performance indicators".

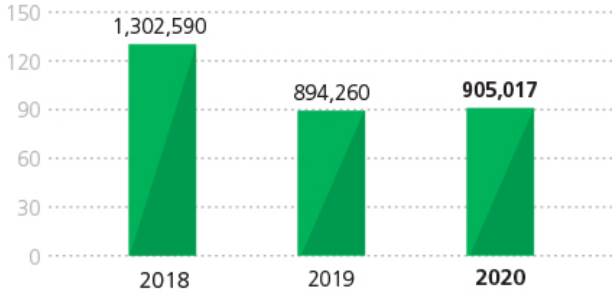
The "Number of energy support services" for 2020 was 905,017. This represents a slight increase of 1.2% compared with 2019. In April 2020, EDF implemented unprecedented measures to help residential customers with the potentially difficult circumstances caused by the Covid health crisis.

In addition to the implementation of the winter truce [2] until 31 May, EDF decided to guarantee energy supplies for all its residential customers and suspended all power reductions and disconnections and all late payment penalties until 1 September 2020. The same exceptional measures were implemented for the second lockdown, until 15 January 2021. At the same time, EDF continued to help its customers by providing energy support services to find a customised solution for their payment problems, on a scale comparable to that of 2019.

(1) National Statistics Fuel poverty detailed tables 2019.

(2) The Brottes law no. 2013-312 of 15 April 2013 establishes a winter truce for residential customers between 1 November year N and 31 March year N+1. Residential customers cannot be cut off for non-payment during this period.

Number of energy support



Key non-financial performance indicator

Close to 250 "dedicated solidarity experts" work directly with social workers to best support the most vulnerable customers. EDF has developed human and digital support to help customers manage their consumption and access their rights. EDF helps customers track and understand their energy use data and take action, based on the data, to control their budget and save energy using the "*Mes Ecos et Moi*" digital solutions available in the customer area and the "*EDF & Moi*" application.

In addition to the statutory schemes, EDF has had an active partnership with the Fonds de Solidarité Logement (Housing Solidarity Fund or FSL) for 30 years. EDF is currently the top contributor, after local authorities, and contributed more than €20.3 million in 2020.

Numerous initiatives to combat energy poverty are implemented in partnership with major charities (*Secours Catholique*, Abbé Pierre Foundation, *Secours Populaire Français*). To strengthen its support in the field, EDF also works with many social conciliation structures throughout France, including around forty PIMMS (multiservice conciliation and information points). Open to all sections of the public and run by professionals in the social field, they help households in financial difficulty access public services and social rights.

EDF partners the "Unis-Cité" association, which provides education on the use of energy vouchers through young people under civic service contracts. It also partners the "Points Passerelle" (Bridging Points) run by the Caisses Régionales du Crédit Agricole, which have joined forces with EDF to help the poorest households control their energy use and find solutions to pay off their energy debts. EDF is continuing its partnership with UNCCAS (*i.e.* French National Union of Municipal Centres for Social Action). EDF and EDF SEI are deploying the PASS (Portal for Access to Solidarity Service), which makes exchanges with social workers more fluid. EDF SEI (Island Energy Systems) and ÉS (Électricité de Strasbourg) distribute Demand Side Management (DSM) kits.

The distribution network operator Enedis develops initiatives within the framework of PIMMS (and chairs their National Union). They participate in the information and support of vulnerable populations in the areas of eco-friendly practices and access to rights and services. Enedis action also complements measures taken by electricity suppliers regarding their unpaid bill procedures, and the Company systematically contacts customers before cutting off their electricity supply or restricting wattage.
ÉS offers a personalised support initiative and each customer experiencing difficulty benefits, in particular, from continuation of their power supply at the subscribed-to level and the time to take the necessary steps with the social services.

In Corsica and the French overseas departments & territories, EDF SEI is continuing its actions to finance energy demand management for customers and social-housing lessors (LEDs, solar water heaters with the region on Réunion Island, heat insulation programmes, etc.). EDF SEI is developing other types of specific initiatives, such as the electrification of remote areas (inland municipalities) in French Guiana or the "*Watty à l'école*" (Watty at school) programme, which helps raise awareness about electricity savings:

- in Belgium, Luminus proposes the "My Luminus" tool, which helps customers to consume less. To help customers potentially experiencing difficulties, Luminus alerts customers when their consumption is higher than usual, and, when appropriate, proposes payment schedules. It participates in the energy poverty platform launched by the Roi Baudoin Foundation. The platform has played an active role with the legislator, and is now focusing on issues of payment default;
- EDF in the UK is continuing its partnerships, notably with Plymouth Citizens Advice and also Income Max, to support vulnerable customers and help them optimise their income by obtaining the relevant grants. EDF in the UK launched a customer support fund and, with the help of Plymouth CA and Income Max, examined the most complex customer situations, during the crisis, to offer them customised solutions.

Exceptional measures implemented to address the health crisis

EDF took swift, strong action to help its customers affected by the health crisis:

- EDF wished to show solidarity with all its residential customers and not only those in a vulnerable position (see Chapter 3, introduction, "EDF, a responsible business during the sanitary crisis"). When the government decided to extend the winter truce until 10 July, EDF had already suspended all reductions and disconnections for supplies of electricity and gas and all late payment penalties until 1 September for all residential customers. By implementing those broader measures, EDF went beyond the measures adopted by the government;
- during the health crisis in the first half of 2020, EDF's 250 solidarity experts intensified and extended their usual calls and contacted social workers to propose individual solutions: customised payment plans or specific solutions to provide the best possible support for customers in a situation of energy poverty. More than 260,000 customers were contacted during the summer of 2020;
- during the second lockdown, EDF implemented the same unprecedented measures taken during the first lockdown. To help residential customers in these exceptional circumstances:
  - EDF guaranteed electricity supplies by suspending, until 15 January 2021, any reduction or disconnection of electricity supplies and any late payment penalties for invoices issued during that period,
  - EDF agreed to postpone payments for its customers in financial difficulty;
- ÉS, EDF SEI and Luminus also adapted their schemes. EDF SEI suspended power reductions and disconnections for non-payment from March through to the end of August. Edison launched its "Edison 4 Italy" programme during the spring lockdown, focusing on vulnerable customers, to extend billing deadlines and propose payment schedules;
- EDF in the UK refocused the work of its specialist priority services team to support the most vulnerable customers, particularly those whose prepayment meters had not been topped up very much or at all, to ensure that their power supplies were maintained or restored as a matter of urgency. Outbound calling campaigns were run for vulnerable customers. Charitable initiatives were also implemented, for example with employees and pharmacies, to deliver medicines to the most isolated individuals;
- in Italy, Edison is a partner of the "Manifesto", a manifesto for the energy of the future, alongside consumers (created to support the liberalisation of the energy market, with energy companies and consumer associations). In the difficult conditions caused by the health crisis, the companies and consumer associations supporting the initiative developed an easy-to-use tool summarising the measures implemented by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA) to help consumers. This comprehensive guide provides guidance and assistance to families and is available on the websites of the companies and consumer associations behind the energy manifesto. It also explains the many additional measures implemented by companies in the energy sector to address the emergency.

3.3.4.3 Social innovation

At the very heart of its business lines and via its Foundation, the EDF group develops initiatives promoting new innovative solutions for the most vulnerable.

3.3.4.3.1 Social innovation: a core part of its business

- EDF is developing "*Don d'énergie*" (i.e. "Energy gift"), a social and digital innovation, in partnership with the Abbé Pierre Foundation. Since the beginning of 2019, EDF's customers with the EDF & MOI application and its newsfeed can make a donation to help vulnerable households pay their electricity bill, irrespective of their electricity supplier. The allocation of these donations is entrusted to Abbé Pierre Foundation, as part of its mission to support the most vulnerable households. EDF matches this tax-free donation.
- EDF has developed several digital tools for its residential customers to help them gain a better understanding of their energy use and reduce their energy use: E.quilibre solution, News Feeds, etc. These tools are rarely used by the most vulnerable households, which often face both digital and energy poverty. EDF R&D is therefore trialling, as part of the "So Mel So Connected" project run by the Agency for Ecological Transition (ADEME), training modules for these tools to be implemented in practice by non-profit partners.
- EDF has created mobile spaces specifically designed to allow it to get out and meet people in the heart of the regions, mainly in the poorer districts. In the form of a mobile home, bus or tent, "*Mon Appart'Eco Malin*" (my smart green flat or MAEM) is designed to explain energy saving tips by presenting concrete uses "just like at home". The MAEM Box is a fun way of raising awareness about demand side management. The main frame represents the main rooms of a home with its appliances and it also contains a card game with questions on energy saving tips. In 2019, EDF presented the MAEM digital game, an application based on the MAEM Box.
- In 2020, EDF continued its partnership with ASHOKA France (social entrepreneurship) and a network of 7 social innovation accelerators. As part of this, EDF partnered a third call for solutions on a theme developed at a workshop attended by various EDF entities and stakeholders, to help address shared challenges. The aim was to come up with a theme related to the legacy of the 2024 Paris Olympic and Paralympic Games. EDF received support from ESS2024, the solidarity platform of the 2024 Paris Olympic and Paralympic Games (bringing together Les Canaux, centres for social, innovative enterprise of the City of Paris, Yunus Centre, Paris2024 and the Olympic delivery authority, SOLIDEO). Under the "Health-driven environments and inclusion" theme (public housing and spaces, health as a core concern of housing; education and infrastructure; sport for health initiatives open to all; social ties, inclusion and local solidarity), EDF will support and assist the five winners.
- As part of its partnership with UNIS-CITES (young people under civic service contracts), the distribution network operator Enedis is working to increase awareness of demand side management and sustainable development issues in the poorest districts, where Enedis is also developing digital inclusion workshops for the most vulnerable.
- ÉS has launched an energy-savings animation project in the form of an Escape Game, in partnership with EDF, the Bas-Rhin Departmental Council and local partners.

3.3.4.3.2 Social innovation and sponsorship

For more than 30 years, EDF group and its Foundation have supported public interest actions. Their corporate sponsorship policy is based on the values of respect, solidarity and responsibility. Endowed with a budget of €10 million per year, the EDF group Foundation has worked with several Group subsidiaries represented on its Board of Directors to promote a Group approach to corporate sponsorship.

Philanthropic actions are carried out either by the Foundation, or directly managed by EDF SA parent company and the Group's subsidiaries:

- in France, in 2020, the Foundation supported 180 projects for a total amount of €2.2 million to help combat poverty. It set up an emergency and solidarity fund to help the most economically disadvantaged cope with the economic and social consequences of the health crisis: food aid, accommodation, basic necessities and delivery of computers, for a total amount of €1.3 million (€562,000 emergency + €750,000 solidarity).
- internationally, the Foundation supported 63 projects to combat poverty in an amount of €2.3 million, including 46 projects run by non-profits for which electricity aids in access to water, health, education and development, by providing them with a combination of funding and technical expertise from the Group's employees.
- it also earmarked €700,000 to help protect international populations (Africa, Asia, South America) from the health crisis and its economic and social consequences through an international emergency and solidarity fund, which provided 400,000 economically disadvantaged beneficiaries with basic necessities (food, hygiene), access to healthcare, the resources needed to access remote learning, back-to-work schemes and food autonomy.
- among the 37 associations supported, Electricians Without Borders holds a special place as a historical partner of the Group: 13 projects supported in 2020 and financial support for the crisis in Lebanon.

Employee volunteers

Working with associations, the Foundation combines financial support with loans of employees via skills-based sponsorship and volunteer work in France.

- In 2020, its support for international inclusion and education projects involved 22 technical skills-based sponsorship assignments over 187 working days by 17 employees in 10 different countries;
- EDF R&D research engineers offered their technological expertise to the public interest, through skills-based sponsorship. In 2020, their skills in physics, mechanics and mathematics were used for the SCIENCES2O24 project to develop innovative solutions and optimise the performance of disabled athletes;
- The Foundation and the EDF group's regional delegations also encouraged employees to volunteer for associations in the regions. A matching platform (EDF Human Pacte) has been developed to match offers from associations and employees wishing to get involved: 289 volunteer proposals were registered on the platform and 900 off-platform;
- EDF employees in the UK raised £100,000 for Prostate Cancer UK which was matched by the Company in an amount of £150,000, by running virtual initiatives during the lockdowns: virtual dance classes, virtual treasure hunts, online raffles, personal videos of employees talking about their own prostate cancer experience and how important it is to support the charity.

Education

Education is a key factor for human development and economic growth and helps combat all forms of exclusion. The EDF group Foundation invests nearly €2 million annually in education, in France and abroad. As education is the first step in reducing social and economic inequalities, it finances solutions that attack the root of the employment problems faced by young people in France. Each year, 2,000 trainees from underprivileged backgrounds are welcomed, steered towards the Company via a platform called "*Viens voir mon taff*" (come see my job), funded by the Foundation. Various major initiatives are implemented for the 100,000 school dropouts who leave the French education system each year without any diploma or qualification.

Internationally, the EDF Foundation helps to improve educational conditions (access to modern teaching tools, provision of evening tutoring, continued teaching even during periods of low amounts of sunshine) and increase the number of children attending school (school canteens, accommodation centres, etc.) mainly by providing schools with power. The Foundation supported five such projects in 2020 representing 5,630 beneficiaries.

Inclusion

In 2020, its support for international inclusion and education projects involved 25 technical skills-based sponsorship assignments over 196 working days by 17 employees in 11 different countries:

- for example, the EDF group Foundation financed an original model for solidarity food stores focusing on food aid, for 215,000 beneficiaries. The model combines measures to combat poverty (payment of a symbolic fee giving access to self-service purchases, with a wide range of choice and diversity) with inclusion and empowerment measures (personalised social support to help individuals manage their budget empowering the most economically disadvantaged) and measures to create jobs and combat food waste (integration projects to get the long-term unemployed back to work, who collect unsold goods and supply the food stores);
- the EDF "*Fonds Agir pour l'emploi*" (act for employment fund or FAPE) works to support job development and promote the social and occupational integration of those in need. In 2020, more than 300 projects were supported by the FAPE and almost 3,500 jobs created or consolidated.

Impact of philanthropic initiatives

The Foundation invested €12 million [1] to support public interest initiatives. Since 2016, EDF and its Foundation have routinely assessed the implementation and impact of the projects financed. Sponsorship agreements set out indicators measuring the implementation and impact for beneficiaries and their achievement is monitored through an annual review requested from the association running the project. 10% of the amount awarded is withheld until the review is produced and the indicators met.

3.4 Responsible development

The Group is committed to a responsible development of its operations, by maintaining and developing a culture of dialogue and consultation for projects run by the Group, contributing to the development of the regions in which it operates, developing industrial sectors and implementing a responsible digital transition.

RESPONSIBLE DEVELOPMENT

CSR COMMITMENTS	CONTRIBUTION TO THE UN SD GOALS	KEY PERFORMANCE INDICATORS
DIALOGUE AND CONSULTATION WITH STAKEHOLDERS	16 PAIX, JUSTICE ET INSTITUTIONS EFFICACES	Proportion of projects on which there is consultation in accordance with the Equator Principles
RESPONSIBLE DEVELOPMENT OF LOCAL AREAS	8 TRAVAIL DÉCENT ET CROISSANCE ÉCONOMIQUE; 9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE; 10 INÉGALITÉS RÉDUITES; 11 VILLES ET COMMUNAUTÉS DURABLES; 17 PARTENARIATS POUR LA RÉALISATION DES OBJECTIFS	Annual rate of procurement from SMEs in France
DEVELOPMENT OF INDUSTRIAL SECTORS	4 ÉDUCATION DE QUALITÉ	Qualitative evaluation
RESPONSIBLE DIGITAL DEVELOPMENT	12 CONSOMMATION ET PRODUCTION RESPONSABLES	Number of customer visits on digital consumption monitoring platforms

3.4.1 Dialogue and consultation with stakeholders

3.4.1.1 Commitment to dialogue and consultation around our projects [2]

The Group is striving to organise a global initiative of dialogue and consultation which is transparent and open for each new project, and which involves local and indigenous communities throughout the lifecycle of those projects. The EDF group is committed to implementing dialogue rules in accordance with the Equator [3] Principles , for all projects worth more than €50 million with a significant impact on regions or the environment, examined at Executive Committee Commitments Committee meetings during the fiscal year.

More precisely, the following procedures will be applied for each project:

- identify stakeholders;
- launch consultation as far upstream as possible;
- provide transparent and clear information to stakeholders on the project;
- gather stakeholder opinions on the project and address them;
- set up a system for dealing with suggestions and complaints;
- ensure that local populations are able to participate in the consultation process;
- ensure that consultations are publicly reported.

For 2030, the goal is for there to be dialogue or consultation on 100% of projects worth more than €50 million in accordance with the Equator Principles.

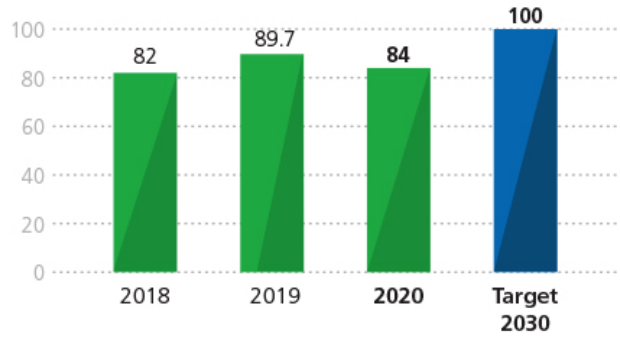
In 2020, projects falling within the defined criteria but not including projects by regulated subsidiaries accounted for the 25 files reviewed by the Executive Committee's Commitments Committee; 84% of these were the subject of a consultation.

(1) On the date of the publication of the non-financial performance statement, the consolidated amounts of support managed directly were still pending.

(2) On the specific issue of access to environmental and social impact assessments (EIA and SIA) in France: In accordance with French regulations, stakeholders have access to environmental (EIA) and social (SIA) impact assessment results for ICPE facilities (i.e. facilities classified for environmental protection), for example at Dalkia or EDF R or on local community sites internationally. EDF releases documentation on projects, such as these EIA and SIA, which are required to be published on prefectural sites; the documentation also include the opinions of the French Environmental Authority or the investigating commissioner to be submitted to debate or a public inquiry where appropriate.

(3) It is a reference framework for the financial sector to identify, assess and manage the environmental and social risks of projects: equator-principles.com.

Proportion of projects on which there is consultation in accordance with the Equator Principles (%)



Key non-financial performance indicator

The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.4.1.2 Some recent examples of local dialogue and consultation

In 2020, EDF continued to use participatory dialogue and consultation procedures for all its projects, regardless of the technology used. These procedures normally lead to the adoption of proportionate solutions balancing environmental, economic, energy and technical criteria. They are monitored closely, in line with the extent and nature of the consultation.

In the hydropower field [(1)]

Due to the type of impacts its projects may have, EDF Hydro has developed specific expertise in this area. In 2020, it produced a corpus of technical guidelines for dialogue and consultation to better address the growing demands for public information and participation.

The following are just a few examples of this expertise:

- an Environmental Monitoring Committee (CSE) was set up at the Sabart site at the launch of the works to act as an oversight, monitoring and steering body and met six times between the end of 2017 and September 2020;
- several information meetings were held for the Malause dam fishway project (Tarn-et-Garonne) with the elected representatives of the eight municipalities affected by the project, the Federation of Municipalities (Communauté des Communes) and the Departmental Committee of Tarn-et-Garonne, the local branches of the Fédération de pêche (Fishing Federation) and the Fédération française de canoë-kayak (French Canoeing Federation), the Tourist Information Office and the various local leisure centres and sports clubs. Their expectations and additional questions will be addressed during the second part of the project, involving the works to be carried out on the bypassed section to address the various local economic development issues;
- a voluntary consultation process was launched by the French government, Natura 2000 and EDF for the Rance river (Ille-et-Vilaine) with all those affected by the seaward end of the river (70 people including representatives of local authorities, local residents, users, economic operators and environmental associations, etc.) and led to the validation of a new Rance water level handbook in March 2020. This met the expectations of many of those affected and will ensure that any rises in the upper water level of the estuary are monitored in the best possible conditions. The Saint-Malo sub-prefecture has proposed to continue the consultation process, by organising two monitoring committee meetings each year, attended by the parties involved in the consultation, designed to obtain feedback from those on the ground and adapt the new handbook accordingly.

In the field of new renewable energies

Two preliminary consultations for photovoltaic projects were successfully implemented in the Pays Terres de Lorraine area. EDF Renewables made a public commitment to remain in the area for twenty years, to maximise the economic benefits for the area. Public meetings were organised with the inhabitants, which led to the creation of a monitoring committee and a participatory workshop on the uses of the site and meetings with nature experts on environmental aspects.

A preliminary voluntary consultation has been launched for the Le Blayais wind power project proposed by EDF Renewables (the first consultation of this type in France, with the support of the *Commission Nationale du Débat Public* (French national public debate commission)) within the local development area of the Blayais nuclear power. In order to facilitate the acceptance of the project, EDF Renewables has decided to develop the project in the form of an extended mix, to be presented in 2021.

In the nuclear field

The listening and dialogue phase launched by the public debate on the PNGMDR (French national radioactive materials and waste management plan) was continued in 2020 through a post-debate public consultation on the plan (September 2020 – February 2021). It involved an online consultation (opinions, questions and answers) and five public meetings held face-to-face or as webinars. EDF has once again raised the issue of changing the status of very low-level waste and creating a new temporary storage site. The conclusions of the public debate officially recorded these principles.

In the UK, the planning permission application for the building of Sizewell C was filed with the Urban Planning Inspectorate (PINS) in May 2020. After its acceptance, EDF in the UK reached out to local residents and stakeholders for their opinions, over a period of 12 weeks. By 30 September, PINS had received 1,287 observations that are currently being processed. Likewise, the project team is also processing all the comments and queries submitted to the Sizewell C information office to ensure that they are taken into account. Some of these have led the project team to consider possible improvements and changes will be discussed with the Suffolk local authorities in the first quarter of 2021.

3.4.2 Responsible regional development

The EDF group is committed to contributing to the development of the regions where it operates, by creating local jobs, purchasing locally and creating economic value and providing a tax revenue. The EDF group is also committed to developing low-carbon sources of energy and access to energy in developing countries.

3.4.2.1 Contribution to development through jobs

3.4.2.1.1 EDF group workforce

A stable workforce in a transitional context

The EDF group's consolidated workforce totalled 165,200 employees at 31 December 2020, including five companies with a workforce of over 10,000 employees: EDF (63,244), Enedis (38,624), Framatome (15,015), Dalkia (18,198 [(2)]) and EDF in the UK (11,717). The overall workforce rose slightly compared to the end of 2019 (+0.3%) against a backdrop of the energy transition, technological developments and intensifying competition in France and the UK. 80% of the workforce is French, 96% of the workforce is located in Europe (including France) and 4% outside Europe.

(1) For the link between consultation issues and regional involvement, see, also, section 1.4.1.3.1.4 "Hydropower generation issues (regional anchoring in hydropower valleys)".

(2) In 2020, the entire workforce of the Imtech subsidiary located in Ireland and the UK was consolidated into Dalkia's workforce. In 2019, 50% had been consolidated into the Dalkia workforce and 50% into the EDF Energy workforce, explaining the differences in the figures for the two subsidiaries.

The workforce in France

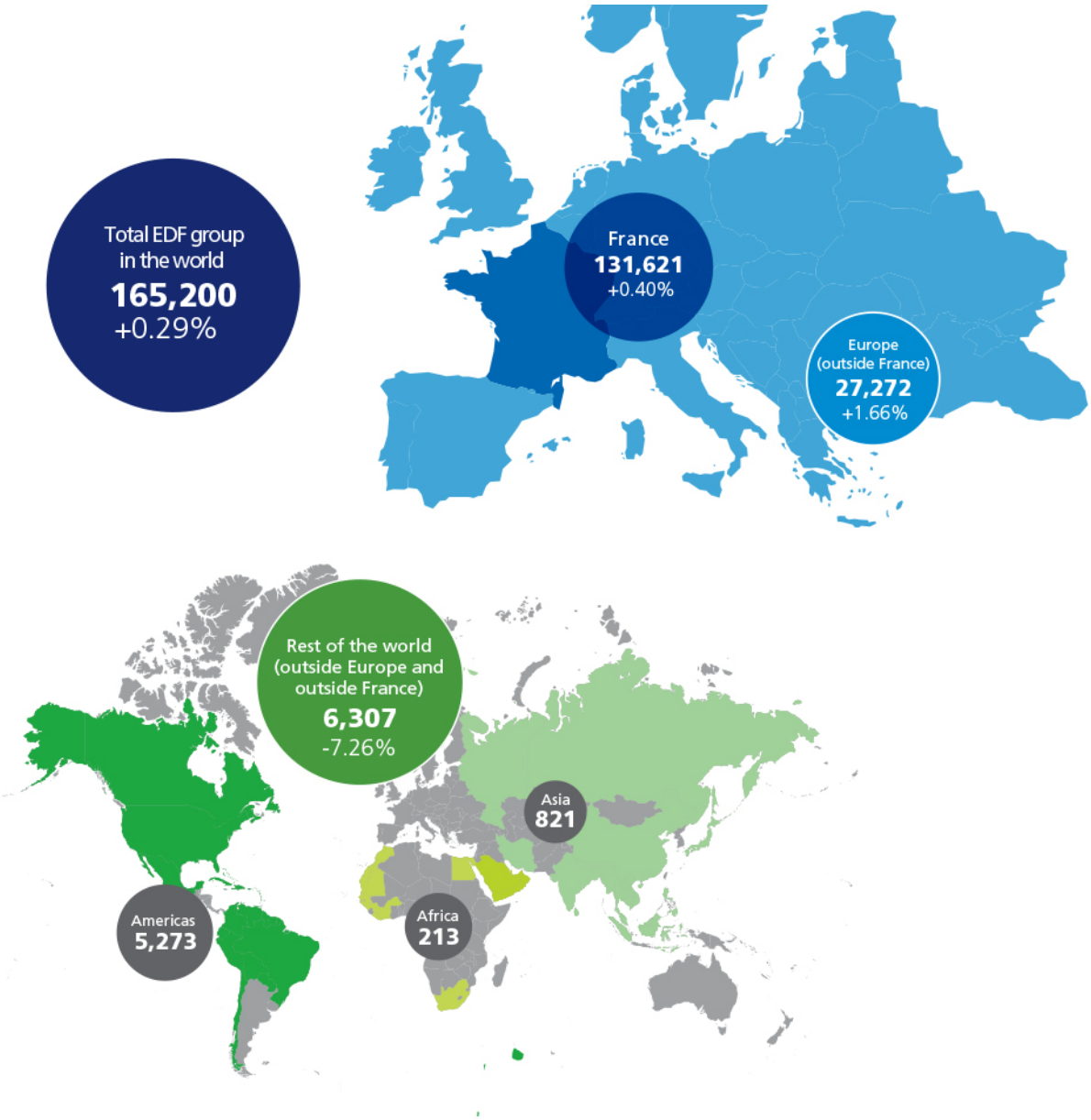
In France, the Group companies had 131,621 employees on 31 December 2020, a very slight increase on the figures for 2019 (+0.4%). This evolution reflects contrasting trends among EDF group companies in France. Nuclear service and supply companies are experiencing strong growth to keep pace with the expansion of their business (+9% for EDF Renewables, 22% for EDF ENR, 3% for Dalkia, 5% for Framatome and 33% for Cyclife in France (decommissioning)).

EDF remains committed to its transformation and to adapting its business model (new nuclear power, development of renewable energies, development of new commercial offers, including digital offers, electric mobility, optimisation of support functions, digitalisation of internal tertiary processes, targeted international development, etc.). These changes are gradually resulting in a decrease in the workforce since the end of 2019 (-1%). In this respect, a voluntary early redundancy plan was proposed to employees in 2019 in departments with declining activity: almost 676 employees therefore left EDF in 2020. Prospective studies have been conducted at the Group level with all subsidiaries in order to anticipate the transformation of its staffing needs and certain key professions to allow it to adapt the workforce and skills in the short, medium and long term, and develop intra-group career paths.

International Group workforces [1]: 96% of the international workforce is European

25.5% of the workforce is located outside France. This figure remains stable, reflecting the decision to reposition Dalkia and Citelum in Europe with a shift away from the Americas and a reverse trend at EDF Renewables, whose workforce has grown by 13% in the rest of the world. The workforce of the Group outside Europe is mainly located in America (5,273), Asia (821) and to a lesser extent in Africa (213).

Detailed geographic breakdown of the workforce as of 31 December 2020



(1) Consolidated subsidiaries

Geographic breakdown of the workforce	2020	Change
France	131,621	+0.4
Europe (excl. France)	27,272	+1.7
America	5,273	
Asia	821	
Africa	213	
Rest of World	6,307	-7.3
TOTAL EDF GROUP IN THE WORLD√	**165,200**	**+0.3**

√ 2020 indicator subject to reasonable assurance check by KPMG SA.

Further details on the breakdown of the workforce [1]

EDF group	Unit	2018	2019	2020
Per entity				
EDF	Number	65,368	63,962	63,244
Enedis	Number	38,691	38,754	38,624
TOTAL EDF group √	Number	165,790	164,727	165,200
Total EDF group headcount (full-time equivalent – FTE)	Number	162,209	161,523	161,200
Per category				
Under 25 years old √	%	7%	7%	7%
From 25 to 35 years old √	%	29%	29%	28%
From 36 to 45 years old √	%	26%	26%	27%
From 46 to 55 years old √	%	26%	26%	26%
56 years old and older √	%	12%	12%	13%
Per category				
Managers	Number	52,366	53,095	53,485
Non-management employees	Number	113,424	111,632	111,715
Worktime				
Part-time employees	Number	10,406	10,389	9,748

√ 2020 indicator subject to reasonable assurance check by KPMG SA.
For gender distribution, see section 3.3.3.1 "Workplace equality".

3.4.2.1.2 Hiring

The EDF group is one of the top industrial recruiters in France, with more than 7,607 employees hired under permanent, fixed-term and 6,724 work-study contracts in 2020. EDF has made work-study programmes a key component of its skills sourcing and "human ambition", meaning that more than one out of every 100 work-study students in France is trained by the Group. The Group also plays an important role in the integration of young people, with 27% of work-study students coming from deprived areas and rural areas.

Hires/departures*	Unit	2018	2019	2020
Hires	Number	9,809	10,377	11,214
Retirement departures/inactive employees	Number	3,775	3,444	3,523
Resignations	Number	3,141	3,285	2,452
Redundancies, dismissals, people made inactive	Number	1,114	1,545	1,174
Turnover	%	5.4%	5.6%	5.6%
Other arrivals	Number	6,739	7,289	6,258
Other departures	Number	8,562	10,259	8,691

** The methodology associated with this data is explained in section 3.7.2.3 "Further details on social, environmental and societal data from the Statement of non-financial performance".*

Recruitment is focused primarily on technical, Information Systems, hard-to-fill, rare or developing professions. The proportion of managers recruited externally remained stable at around 28% at the Group level, as did the proportion of women recruited despite a decline in the attractiveness of the industrial sector.

(1) The methodology associated with this data is explained in section 3.7.2.3 "Further details on social, environmental and societal data from the Statement of non-financial performance".

There were several new recruitment developments in 2020:

Implementation of the "*employeur Groupe*" (Group employer) brand

The Group has created this brand promoting its subsidiaries (nuclear and energy services) on the careers website using agile practices. It has redesigned the job descriptions and created regional pages. EDF is constantly innovating to maintain a high level of attractiveness for the Group, for example the open innovation campaign for women in industry (Co-développons l'industrie au Féminin) in the first half of the year and the first external internship e-forum in the second half of the year, to offer young people 2021 internships during the "Electric Days".

EDF remains one of the most attractive employers for students, work-study students and young graduates and this is confirmed by this year's rankings:

- Epoka ranking: EDF is the most attractive company for students and young graduates in the energy sector and ranks second overall, for all sectors combined, with engineering schools;
- Universum ranking: EDF ranks in the top 10 most attractive companies for engineering students;
- Happy Trainees ranking: EDF came third in the Happy Trainees ranking, measuring the level of satisfaction of work-study students and trainees, in the category of companies hosting more than 1,000 young people (work study students and trainees in the Company).

Likewise, EDF continues to rank highly in all studies conducted with experienced professionals:

- Universum ranking: EDF ranks in the top five most attractive companies for managers who graduated from engineering schools and ranks second for experienced professionals at the *Baccalaureat* (Bac or high school) +2/3 level;
- IFOP ranking: EDF is the third most esteemed French company (+7 places).

Online interviews

All job interviews were conducted online during the health crisis, helping to strengthen the EDF group's digital recruitment image. Its image was also boosted by the first jobdating internship e-forum in July 2020, designed to match jobs to the Group's trainees reaching the end of their studies.

Recognition of external skills

The EDF group has adapted the way it recognises external skills: recognition of new qualifications, exceptional recruitments without the EGI status for niche skills… For example, in order to increase its attractiveness in the competitive market for IT profiles, it has decided to hire level-7 employees (Bac +5) at a managerial level, to ensure that their starting salaries match those offered on the market.

Hiring through employee referral programmes

Following in the footsteps of several Group subsidiaries, EDF has decided to trial an employee referral programme, with employees acting as recognised, valued ambassadors to improve sourcing quality. This type of programme has three main advantages: it improves the Group's attractiveness, it provides new hires with a better view of their opportunities from the very start of their career and allows co-recruiting business lines to benefit from the same skills throughout a shared project.

A new responsible, win-win sourcing process

At the beginning of 2020, the EDF group set up a responsible, win-win sourcing process, making job offers to employees with experience in the industrial sector affected by a redundancy plan. This new approach was further strengthened in the summer of 2020, in the form of support for the aeronautics industry, by publishing a set of job offers for employees affected by the crisis in that industry. These experienced profiles balance out team pyramids in terms of age, as the Group mainly recruited young graduates.

3.4.2.1.3 Examples of its contribution to territorial development through jobs

The employment footprint of a region, project or field of activity can be split into direct impacts (EDF employees), indirect impacts (impact of EDF purchasing on its entire supply chain) and spin-off impacts (impact of employee spending). Both EDF employees and the employees of companies in EDF's purchasing supply chain spend some of their salary in the region and pay taxes and duties.

EDF SA's employment footprint

The 2020 study [1] shows that 339,857 jobs (including 66,487 direct jobs) are supported, up by 10,000 jobs compared to 2018, meaning that one direct job generates 4.1 jobs in the area, i.e. 1.2% of all French jobs are supported by EDF.

Employment footprint of the production and engineering business lines (Nuclear & Thermal Fleet Department (DPNT) and New Nuclear Projects & Engineering Department (DIPNN))

According to the fifth study on the employment impact of production and engineering business lines in the DPNT and DIPNN departments (including purchases by the Edvance company) and the Thermal Expertise and Multi-Sector Industrial Support Division (DTEAM) for 2019, the effect on national employment in terms of the number of jobs represents 37,880 direct jobs, for a total of 213,813 jobs including tier-one indirect jobs, indirect jobs in the rest of the supply chain, jobs created by household consumption and jobs created by government spending. One direct EDF job contributes to supporting over 4 indirect and spin-off jobs.

Contribution to employment of the business lines and subsidiaries of the Group

EDF Hydro generated 5,727 direct jobs, including 5,431 open-ended contracts and 293 work-study contracts, as well as 3,276 indirect jobs across the region.

In the UK, the HinkleyPoint C project has generated 10,300 jobs since its launch and 640 apprentices have been trained.

In Laos, the Nam Theun 2 Development Fund was launched to finance livelihood, health, education, and capacity-building projects, selected and implemented by communities with technical support, contributing to the creation of 200 local jobs with sub-contractors.

Enedis's workforce represents 45,000 to 50,000 jobs, figures in decline due to the Covid crisis.

Dalkia helps support the forestry industry through the operation of biomass heating plants, representing almost 2,000 jobs in France in 2020.

The EDF Renewables Saint-Nazaire offshore wind farm project has a significant social and economic impact, particularly locally (Pays de la Loire region), through the General Electric plant in Montoir de Bretagne and the Chantiers de l'Atlantique plant. 1,800 FTEs worked on the Saint-Nazaire project in September 2020.

3.4.2.2 Contribution to development through taxation

EDF has implemented a Group tax policy to define the applicable principles, in terms of taxation, to all of the Group's relations with its financial or business partners and the government or tax authorities. The tax policy is applied by the Group Executive Director responsible for the Group's Financial Management. It was approved in 2017 by the Executive Committee.

At the end of 2020, as in 2019, the Group uploaded its country-by-country report (of data for fiscal year 2017) to the French tax authorities, in accordance with the provisions of Article 223 (5) c) of the French General Tax Code which follows the OECD's recommendations.

3.4.2.2.1 Group tax policy

A wide scope

The policy covers all the Group's taxes: direct and indirect taxes, duties, contributions, any tax or customs deductions which are ultimately the responsibility of the Company or its customers (when EDF merely acts as a collector on behalf of third parties).

(1) Goodwill study based on the 2019 consolidated figures.

This policy must be applied throughout the Group, by all controlled entities regardless of their nature or geographical location, with the exception of regulated infrastructure managers, for whom it constitutes a guide. All Group staff must comply with this policy which aims to protect the Group's reputation and to reduce any tax risks to which it may be exposed through its activities. The policy follows the following guidelines:

- strengthen the tax performance of the Group in strict compliance with national and international tax laws and regulations;
- control tax risks through continued, systematic improvement, in all Group entities, of the identification and management of fiscal risks;
- implement the tools, reporting and actions necessary for the continued, optimum, forward-looking management of tax cash flows [1], as well as attentive and proactive monitoring of the Group's effective tax rate;
- ensure the conditions necessary for obtaining constructive relations with the tax and government authorities of all kinds by maintaining a transparent, professional relationship with them.

Ethical principles

In the context of the allocation between countries of operating margins internal to the Group, EDF strives to apply a transfer price policy in accordance with the principles of the OECD to justify the resulting revenues. EDF has no legal implantation (company, branch or office of representation) in a territory listed as a non-cooperative state or territory as defined by French and international legislation which is not determined by economic activity reasons and under no circumstances purely by tax reasons. Similarly, cash flow through these countries is prohibited where it is for tax reasons only.

Presence in Luxembourg and Ireland

Like all major French and international groups, EDF relies on captive and mutual insurance companies to supplement the cover provided by traditional insurance markets. The captive and mutual insurance companies enable EDF to reduce the cost of its insurance schemes and the total sum of premiums paid. EDF has three captive insurance companies, based in Ireland and Luxembourg:

- Wagram Insurance Company DAC. (wholly owned by EDF), an insurance company founded in 2003 in Dublin which is involved in the majority of the Group's insurance schemes;
- Océane Ré (wholly owned by EDF), a reinsurance company founded in 2003 in Luxembourg to reinsure EDF's nuclear civil liability risk;
- Tereco (wholly owned by Framatome), a reinsurance company within the Framatome consolidation scope located in Luxembourg, to reinsure a portfolio of risks including that of Framatome's nuclear civil liability.

3.4.2.2.2 Taxes paid by the Group

In 2020, the EDF group's tax liability [2] was €3,797 million, an increase of €1 million compared to 2019.

The EDF group thus contributes to the development of the French regions through an annual payment of more than €1.8 billion in local taxes to local authorities.

The income tax expense amounted to (€945) million in 2020, corresponding to an effective tax rate of 73.1% [3] (compared to an expense of (€1,532) million in 2019, corresponding to an effective tax rate of 23.96%). The €587 million drop in income tax expense between 2020 and 2019 is analysed in section 5.5.5 "Income taxes".

Income taxes paid by the Group amounted to €983 million in 2020 (€922 million in 2019) [4].

Income tax paid in all the countries where the Group has subsidiaries is detailed in an appendix, in section 3.9.5 "Further detail of income tax paid in all countries where the Group has subsidiaries".

3.4.2.3 Contribution to development through purchasing

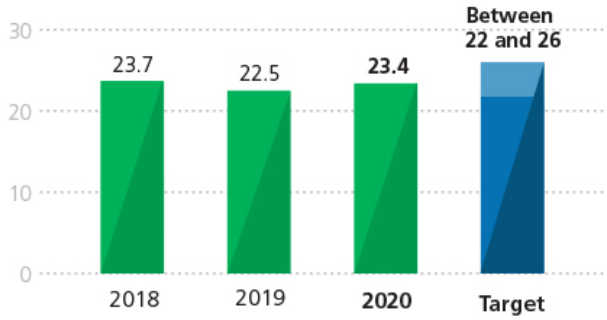
3.4.2.3.1 Amount of local purchasing

The Group Purchasing Department continues to interact with suppliers – including SMEs, ISEs, VSEs and start-ups – with the operational implementation of a process adapted for innovative purchasing and to make it easier for SMEs to access EDF's markets. This entails the acceptance of:

- simplified general terms and conditions of purchase and special terms and conditions for "small orders" (online on the Provider dedicated portal on the www.edf.fr);
- a simplified capacity questionnaire for new suppliers, for tenders with amounts lower than the thresholds of European Directive 2014/25/EU;
- a tailored purchasing process and standard agreements for innovative start-ups and SMEs (45 tests, €1.6 million of innovation purchases in 2020);
- a dedicated space on the www.edf.fr institutional site (single point of access).

In terms of purchases from SMEs located in France, the target range is between 22% and 26% of purchases by EDF and the distribution network manager, Enedis [5]. For 2020, this figure stands at 23.4%, within the target range.

Annual rate of procurement from SMEs in France (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

In 2020, as part of the consultation process, the Purchasing Department keeps on encouraging tier-1 suppliers to employ local suppliers meeting the requirements of European Directive 2014/25/EU, for work or service contracts on electricity generation sites. Carrying on from the efforts made in 2019, the Purchasing Department is involved in the "Destination ETI Smart City Utilities" programme run by the Pacte PME association and various events organised by BPI France and chambers of commerce. It runs awareness-raising campaigns for SMEs regarding the contracts and authorisations required to tender for EDF group contracts and puts them in touch with interested business lines and subsidiaries. It also assists business lines, to help local companies access decommissioning projects (Brennilis, Bugey, etc.) or take part in calls for tenders for the Grand Carénage refurbishment projects.

As a recent example, more than 4,000 businesses are registered on the HPC supplier portal for the EDF HPC project. Local suppliers sign contracts directly with HPC or with its tier-1 suppliers. Since the start of the project, £2.2 billion has been spent with regional suppliers directly. Likewise, for the new Romanche Gavet power plant, its inauguration in September 2020 marked a key stage in the Romanche Valley hydroelectric reconfiguration project: in terms of its contribution to local economic development, 637 companies and subcontractors worked on the project and orders worth €108 million were placed with local companies in Auvergne, not to mention the 306 FTEs working at the peak of the project.

(1) Tax cash: tax actually paid or recovered.
(2) See note 5 of the appendix to the consolidated statements on the "Operating profit before depreciation and amortisation".
(3) See note 9.2 "Reconciliation of the theoretical and effective tax expenses (tax proof)" in the notes to the consolidated financial statements.
(4) This information has been restated for the IFRS 5 impact of the E&P business being sold.
(5) Enedis is an independently managed subsidiary.

3.4.2.3.2 Responsible procurement strategy and practices

Procurement strategy

EDF works with around 12,100 suppliers each year.

The Group Purchasing Department manages EDF's purchases, excluding fuel purchases and a portion of tertiary, IT and telecommunications purchases for certain subsidiaries. This totalled more than €7.2 billion in orders in 2020 (compared to nearly €8 billion in 2019), excluding suppliers belonging to the EDF group, broken down as follows: €4.3 billion in engineering and production purchases, €1.8 billion in tertiary and services purchases and €1.1 billion in IT and telecom purchases.

In 2020, EDF's top five suppliers accounted for 11.5% of the total amount ordered by EDF (excluding fuel purchases), and the top ten accounted for 18.6% of that amount. In alphabetical order: Cap Gemini Technology Services, Clemessy, Demathieu Bard Construction, Endel SAS, GE Steam Power Service France, Onet Technology TI, Orano DS Demantèlement et services, Orys, Spie Nucléaire and Westinghouse Électrique France SAS.

Suppliers are considered strategic based on a criterion of non-substitutability and the purchasing volume. The supplier dependency rate is also monitored. EDF implements suitable monitoring actions.

Responsible purchasing practices

EDF's responsible purchasing policy is at the heart of the Group's social and environmental responsibility practices in its supply chain. It is structured by the Group Purchasing Department, which sets the general framework and manages the Purchasing function while respecting the management independence of network managers.

Further information about the Group's responsible approach to tackling the health crisis can be found in the introduction to this chapter ("EDF, a responsible approach to tackling the health crisis").

Under the Group Purchasing policy, as updated in 2019, its suppliers are required to comply with the Group's values and all contracts must include environmental, social and human rights clauses. Suppliers may not take part in any tendering procedures unless they have signed a compliance undertaking [(1)], relating to bribery and corruption, money laundering, terrorist financing and conflicts of interest. The "Sustainable Development Charter between EDF and its suppliers" [(2)] forms one of the contract documents making up each contract and is binding on all suppliers and their own value chain. Even when these mechanisms are not directly applied, the major subsidiaries use equivalent methods of commitment adapted to their specific industrial or geographic characteristics. For example, all of EDF Renewables' qualified suppliers have signed its sustainable development charter.

Likewise, buyers are also educated about the importance of the responsible purchasing approach, mainly through their training (special module on this subject).

The Group Purchasing policy encourages local sourcing and value creation in the regions [(3)]. More than 97% of its purchases are made in France, mainly due to the mechanism used to split contracts into various lots, which facilitates access to the Group's contracts. Through this policy, it has a long track record of giving preference to relationships with SMEs and using the sheltered worker sector and structures for integration through economic activity. EDF makes full use of the new possibilities offered under Directive 2014/25/EU, allowing certain purchases to be reserved for these sectors. In 2020, EDF's purchases from the solidarity sector amounted to €13.5 million.

The voluntary development of industrial synergies between EDF entities reinforces the Group's coherence in its relations with suppliers and service providers. This is the case, for example, for purchases of wind turbines (for which Luminus and EDF Renewables cooperate) and also for hydro, nuclear, thermal and HVB power and tertiary and IT purchases, for which nearly all of the European subsidisers benefit from EDF framework agreements.

When implementing purchasing contracts, the Group Purchasing Department ensures that financial balance is maintained with respect to suppliers, in particular through compliance with payment deadlines and pricing actions. Each buyer shall sign the mandatory ethical undertaking which lists the principles to be complied with in relationships with current and prospective suppliers.

In July 2019, EDF was sanctioned by the Directorate-General for Competition, Consumer Affairs and Fraud Control (DGCCRF) with regards to late payments to its suppliers. It quickly launched a proactive action plan to ensure that all invoices are paid on time. The renewal of the Supplier Relations and Responsible Procurement (RF&AR) certification, confirmed at the end of September 2020, after a follow-up audit, recognises the progress made. This certification awarded to EDF in 2015 by the Ministry for the Economy, *Médiation des Entreprises* and the French Procurement Board (*Conseil national des achats*) rewards companies that have sustainable and balanced relationships with their suppliers [(4)].

The EDF group offers its suppliers collaborative reverse factoring, granting them the possibility to pre-finance their invoices before the contractual due date, as soon as EDF issues the payment voucher [(5)].

Collaborative reverse factoring	2018	2019	2020
No. of beneficiary suppliers	532	550	692
Amounts *(in millions of euros)*	744	1,074	1,183

Responsible, balanced supplier relations

The EDF group has used a company mediator since 2010. Suppliers may refer a matter to the mediator directly, free of charge, through its website or by post [(6)], as stated in the General Terms and Conditions of Purchase and on the Group's purchasing platform.

Finally, as is the case for all stakeholders, suppliers can use the Group's whistleblowing system, set up in accordance with the Sapin 2 and Duty of Care laws, which guarantees anonymity and is available in the Group's six languages [(7)].

In order to foster dialogue and promote local sourcing and skills development for local businesses, the entities in each country organise regular forums or specific schemes such as "CAP ENR" and the "One River, One Territory" workshops.

The Group Purchasing Department continued its proactive programme of "Productivity Partnerships". The aim is to improve contract performance through cooperation between EDF and its suppliers, to their mutual benefit. The benefits may be financial, organisational or technical (indirect gains, such as shortened construction times or avoided costs). In 2020, the Group Purchasing Department decided to switch the focus of the "Productivity Partnership" monitoring to accurately measurable gains [(8)].

Productivity Partnerships	2020
Productivity gains within the scope of EDF *(in million of euros)*	44.1

(1) edf.fr/sites/default/files/Lot%203/FOURNISSEURS/HOMEPAGE/Nos-processus/20190501_edf-declaration-et-engagement-de-conformite.pdf
(2) edf.fr/sites/default/files/Lot%203/FOURNISSEURS/ACHAT%20RESPONSABLE/charteddedffournisseursv2042014.pdf
(3) See section 3.3.1.2.6 "Creation of value in the regions".
(4) EDF was one of the first signatories of the Responsible Supplier Relations Charter.
(5) EDF enables its suppliers to benefit from interest rates based on its own financial risk and credit standards.
(6) mediateur.edf.fr or by post (Médiateur du groupe EDF – TSA 50026 – 75804 Paris cedex 08).
(7) edf.fr/edf/dispositif-alerte-groupe
(8) The 2020 figures cannot therefore be compared to those of previous years, measuring a much wider range of productivity gains.

Enhanced risk analysis

Supplier compliance with CSR commitments is primarily ensured by a mechanism prioritising assessments based on risk mapping covering all of EDF's purchasing categories, limited to the purchases covered by the Group Purchasing Department. On this basis, in 2020, the Group Purchasing Department enhanced the performance of its risk analysis, implemented in particular in accordance with the "Duty of Care" law. The new methodology factors in all CSR aspects (environment, working relations and working conditions, human rights, ethics and compliance), and ultimately allows it to determine the level of residual risk and identify the action to be taken with the supplier.

Inherent risks and residual risks [(1)] are assessed on a scale of 1 to 4: low, material, major or critical risk. Any critical residual risk in the assessed segments can be secured using countermeasures implemented prior to contracting, the contractual clauses and contract monitoring. Major residual risks have been identified in the various sectors of purchasing, mainly concerning safety, ethics, waste, the use of rare materials and human rights. 15% of the purchasing segments analysed are classified as having a major residual risk, 51% are classified as having a material residual risk and 34% are classified as having a low residual risk.

Supplier monitoring is mainly carried out by the Division or Contract Management, which uses Performance Assessment Sheets and Supplier Assessment Sheets. Almost 10,000 assessments are completed each year, on almost 2,000 suppliers.

CSR assessments and audits are also carried out:

- the Group Purchasing Department uses Afnor's Acesia online assessment and dialogue platform to send these questionnaires. The questionnaires completed by the supplier are systematically (and independently) checked by the Afnor teams. This tool makes it possible for purchasers and suppliers to share an approach of continuous improvement in Corporate Social Responsibility;
- on-site supplier audits are conducted by external, independent providers.

At the end of 2020, 2,200 suppliers were questioned using the Acesia platform, and nearly 900 have been controlled. The assessments were "satisfactory" for almost 40% of the audited questionnaires. The suppliers to be assessed or audited are mainly selected based on the new supplier risk mapping and information received from buyers and business lines, on the contracts in progress. Group entities that do not use the Acesia platform use their own specific assessment methods. Suppliers of the Nuclear Division must agree to comply with the Progress Charter for Exemplary and Efficient Nuclear Power and the Social Specifications of the Strategy Committee for the Nuclear Sector. Edison uses a self-assessment platform that focuses on the ten principles of the Global Compact and is shared with other companies. EDF Renewables assesses its suppliers of strategic wind and solar energy equipment in its qualification processes, comprising selection criteria in all CSR fields. A Chinese turbine supplier that qualified for the very first time was only selected for its ISO 14001-certified plants.

All Group entities conduct assessment or follow-up audits in their supply chain. For example, the Dalkia teams conducted 2,225 health and safety audits on its subcontractors in 2020. EDF Hydro audited 62 of its suppliers: one of them obtained an insufficient CSR risk control rating for a subcontractor in China. As a result, it was asked to produce an action plan and the orders placed with it were monitored closely. Luminus noted a major discrepancy with a subcontractor of one of its main suppliers. After several alerts, the entity suspended its contract until the relevant company became compliant.

The Purchasing Department conducted 40 CSR on-site audits worldwide, 48% of which were in France. These audits cover all CSR aspects: environmental, social and ethical policies, commitments and practices. Four quality audits were also conducted. CSR audits are designed to test the CSR commitments adopted and are conducted on site (head office or production site of the supplier or place of work at an EDF site). A recent example of this is the campaign of audits conducted on tenderers and their main subcontractors for a call for tenders in the "workwear" category. Contracts may only be awarded to suppliers whose audit was deemed "Acceptable with Comment". In general, the 2020 health crisis led to an unavoidable drop in the number of on-site audits, postponed until 2021. Apart from eight year-end audits whose reports were still pending on the date of review, 41% had a "Satisfactory" rating, 56% an "Acceptable with Comment" rating and 3% an "Insufficient" rating, requiring supplier action plans. A follow-up audit may be scheduled for the year following any audit deemed "Insufficient" or "Unsatisfactory", based on the proposed action plan and the opinion of those responsible for the contract (purchasing/business line). These campaigns have shown that suppliers still have a relatively low level of CSR risk management in their own supply chain, particularly for the SMEs audited. However, the risk of a pandemic had been properly integrated by all those audited. Additionally, the operational management of safety and environmental issues is increasingly implemented through certification processes such as the MASE or ISO 14001 certification.

3.4.2.3.3 Coal and uranium supply chain

Since its coal contracts were taken over by JERA Trading (JERAT), EDF has no direct contractual relations with mining companies or the market, but remains an active promoter of the Bettercoal responsible coal purchasing initiative that EDF helped to found. Bettercoal brings together energy companies, port institutions and coal terminals to promote CSR in the coal supply chain, mainly at mining sites, to ensure that fundamental rights are respected. The operational approach (audits and self-assessments) is based on a code that sets out ethical, corporate and environmental principles and provisions relevant to mining companies. It takes into account general performance requirements, including management systems, and also performance requirements concerning: ethics and transparency, human and labour rights (such as the prevention of forced and child labour, the right to a decent wage), social issues, including health and safety, and the environment. EDF has not renewed its membership but its coal supplies remain covered by Bettercoal as JERA Trading, its supplier, is now a member, thus increasing Bettercoal's influence in Asia.

EDF obtains its uranium supplies over the long term under diversified contracts in terms of origin and suppliers, in most of the main producing countries (Australia, United States, Canada, Kazakhstan, South Africa and Russia). The clauses authorising the completion of audits and setting out EDF's expectations in terms of enforcement of the fundamental rights and main international standards by suppliers and sub-contractors have progressively been added to contracts. The uranium mine audit system used by EDF since 2011 ensures that the ore is extracted and processed in good environmental, social and societal conditions. The method was developed with the WNA (World Nuclear Association), consisting of a standardised framework recognised by all those involved in the sector. It takes into account the issues of human rights and fundamental freedoms (human rights, whistleblowing register, rights of indigenous peoples and radiation protection) and also the environment, in the broadest sense of that term (water, diversity, waste, site clean-up after extraction).

Every year, EDF carries out mine audits through internal means (2 audits per year). The reports present the main strengths, recommendations and suggestions. The most common ones relate to health and safety (wearing personal protective equipment such as gloves or googles), the display of safety instructions, monitoring accidents, performing radiological controls, monitoring carbon emissions and proposals relating to well-being in the workplace. Audit recommendations are included in the continuous improvement plans. The 2020 audit programme had to be suspended due to the international health crisis. These audits will be conducted as soon as the health situation improves. The Nuclear Fuel Division (DCN) worked alongside its suppliers to ensure that they were monitoring the effects of the health situation on their facilities and organised regular conference calls with them to share information about the work organisation methods implemented to protect the health and safety of employees.

(1) Residual risks are the risks remaining after countermeasures have been adopted.

3.4.2.3.4 Responsible subcontracting

EDF's subcontracting policy focuses on three major themes:

- providing service providers with visibility and having long-term supply partners;
- helping the Group improve its sub-contracting practices by defining criteria to support decision-making in terms of strategy, economics, skills and social impact;
- developing socially-responsible sub-contracting practices, particularly through the new EDF group CSR agreement (Article 4) signed on 19 June 2018, as well as the agreement signed on 19 October 2006 on "Socially-Responsible Subcontracting" at EDF.

Group CSR agreement commitments

The Group may be required to use subcontractors with employees under contracts drawn up in a country other than the one in which it operates. In this case, particular attention is paid to human rights, working conditions, housing conditions and employee health and safety.

EDF group implements a compliance plan, including a map of the risks identified in relation to its suppliers and subcontractors, a risk assessment, and the risk mitigation measures taken. Subcontracting is mainly used for industrial and commercial activities, for information systems and real estate operations. 2020 was consistent with the trends seen in 2019 in terms of the types of business activities that were outsourced.

As a general rule, in all these areas, the decision to outsource or backsource activities is based on a strategic analysis for each industrial policy segment.

The analysis takes into account criteria such as:

- the need for the Company to master strategic skills (core businesses, etc.);
- one-off, seasonal or project-related variations in workload and the flexibility needed to address them;
- maintaining a robust project management approach and the required supervisory skills;
- the priority given to high added value activities in-house;
- the scarcity of certain highly specialised skills that are only needed from time to time;
- new skills, which are not held (or not held to a sufficient extent) in the Company;
- the hours of operation required;
- economic aspects (budgetary constraints, expected gains/savings, etc.).

Subcontracting policies are reviewed regularly, generally once a year, to adapt them to internal or external changes. They are monitored by a global CSR committee, representing all the Group's trade union organisations and two international federations (PSI and IndustriAll), which meets once or twice a year, and by a steering committee that is responsible for the operational monitoring of the body, meeting twice a year. At EDF SA, a monitoring committee for the socially-responsible subcontracting agreement, representing the signatory trade union organisations, meets twice a year to discuss the implementation of the agreement through the industrial policies of the business lines.

In the industrial field

The improvement measures launched in 2015, reflected in the Progress Charter signed in June 2016 between EDF and the Professional Organisations representing the Group's subcontractors, continued in 2020. Specifically, support for subcontractors, in place since 2017, will continue at the Flamanville 3 work site, with a view to reducing the workload. Support for subcontractors at sites being closed down is organised with local stakeholders. Personalised support was given to Fessenheim subcontractors in 2020.

In the nuclear field and with other operators, EDF gave industrial operators an idea of their workload over the next nine years, at the "*Journée Perspectives France*" organised by the Groupement des industriels français de l'énergie nucléaire (Grouping of French industrial operators in the nuclear power sector or GIFEN) held on 1 October 2020. This unprecedented assumption-based practice allows industrial operators to plan and prepare for the future in the best possible way.

Likewise, one of the various projects under the "excell" plan launched in 2020 is to improve EDF's relationships with its suppliers as part of the plan's aim to enhance industrial quality. This project strives to ensure that suppliers in the nuclear industry become genuine EDF partners, to improve the performance of major industrial projects. As part of this, EDF launched its first Supplier Relationship survey in September (144 suppliers surveyed) to compile information about their points of view and obtain feedback. This process was particularly appreciated by suppliers. The results support the action taken in terms of contractual improvements and the extended enterprise model. Moreover, among the points of satisfaction, suppliers are very happy with the working conditions at EDF sites, in terms of safety (97% stated that their employees work in optimal safety conditions), their treatment (91% stated that they were treated well) and health (89% stated that they received appropriate health monitoring).

The action taken in the nuclear field will be further strengthened and stepped up under the stimulus package. In particular, €200 million has been earmarked for supporting SMEs/MSEs in the form of an investment fund financed by the State (€100 million) and EDF (€100 million), to be invested in two tranches. The main aim is to support MSEs and SMEs experiencing problems in the sector or to help them grow.

In the field of Information Systems

In 2020, the Company continued to implement its industrial strategy in the IT field which determines the sub-contracted share. This is particularly demonstrated by the continued proactive initiatives promoting open source software (unrestricted use, free of charge), upskilling MSEs, SMEs and start-ups and simplifying contractualisation procedures, mainly with start-ups, which are vectors for innovation. Vigilance regarding training conditions and service provider turnover has been maintained, particularly as the total number of suppliers in the IT field continued to increase.

In the commercial field

In an increasingly competitive context, the Sales Division continued to use outsourcing to deal with variations in workload and cover extended hours, with value-creating tasks being directed towards internal consultants. All of EDF's customer relations centres, both internal and external, are located in mainland France. External providers are selected in compliance with public procurement rules and are certified for customer relations and business development activities. Its in-house centres have chosen the "Afnor CSR Commitment" label.

3.4.2.4 Contribution to development through access to energy in developing countries

Access to electricity is a vector for progress and development, including in the areas of health, education and security. The global electrification rate has increased steadily since 2010 but more than 800 million people still have no access to electricity, with around one half of them being located in Sub-Saharan Africa. According to the International Energy Agency (IEA), the number of people in Africa without access to electricity is set to increase in 2020 for the first time in many years, as per capita income has dropped by about 6%.

This has been clearly reaffirmed in the United Nations sustainable development objectives. EDF is continuing its efforts in this area, and has updated its models beyond its scope of action. EDF is developing new business models that combine its traditional know-how with technological and economic innovation.

3.4.2.4.1 New business models

EDF is developing off-grid projects designed to provide residential customers and very small enterprises, mainly in Africa, with electrical services, including ZECI in Ivory Coast, ZEGHA in Ghana, BBETO in Togo, KES in South Africa, Sun Culture since 2020 (solar-powered pumping) in Kenya, and SMG in Zambia (see section 1.4.5.3.9 "Off-grid energy").

With about €40 million for the last four years invested in rural electrification, EDF today makes it possible to supply energy (10 to 13MW of installed capacity) to more than 800,000 people and aims to multiply this figure by 4 over the next 3 years. This energy is supplied along with "low-energy" equipment (lamps, radios, fans, televisions).

New products are also being developed to meet the needs of local populations, particularly solar-powered pumps, and it wishes to accelerate the development of mini-grids.

The International Division launched a programme to supply 5,000 solar-powered water pumps to the Togo through its subsidiary Bboxx. EDF Togo has partnered with the Togolese State, which will subsidise part of this programme, designed to help small farmers in rural areas suffering from the effects of the Covid pandemic.

An EDF R&D project is specifically dedicated to assessing and testing energy access technologies, that are then rolled out by EDF's International Division with its partners in various African countries. EDF R&D is continuing its research into microgrids, for a reliable, low-cost mass production meeting local needs, for local markets. In 2020, R&D continued its development of two digital energy access tools. The first aims to define optimal strategies between the extension of existing networks, development of independent microgrids and individual solutions (solar kits). The second aims to identify the best areas for a commercial development of solar kits, in Africa or South-East Asia. EDF R&D, through its EIFER centre in Germany, is also involved in the European LEOPARD project to disseminate microgrids in Africa, with a prototype to be tested in villages in Benin.

3.4.2.4.2 Major energy access projects

Most major EDF projects, especially those in Africa and Asia, are designed to improve access to electricity on a local, regional and national scale.

The hydroelectric dam project In Nachtigal, Cameroon, meets the country's growing demand for electricity with a sustainable low-carbon solution, and a very competitive electricity generation cost. The project is a national priority for securing Cameroon's electricity system.

3.4.2.4.3 Sponsorship

The EDF group also supports energy access across the globe in the form of sponsorship, through its Foundation. The Foundation supported 39 projects run by non-profits for which electricity aids in access to water, health, education and development, by providing them with a combination of funding and technical expertise from the Group's employees, for a total amount of €1.5 million.

Internationally, the EDF Foundation helps to improve educational conditions (access to modern teaching tools, provision of evening tutoring, continued teaching even during periods of low amounts of sunshine) and increase the number of children attending school (school canteens, accommodation centres, etc.) mainly by providing schools with power. The Foundation supported five such projects in 2020 representing 5,630 beneficiaries a year, including:

- supplying electricity to the Education Centre of the "*Futur au Présent*" association in Ziguinchor, Senegal, which helps to provide schooling to young girls who work;
- supplying electricity and water for the training centre in Banteay Chhmar, Cambodia, with "*Enfants du Mékong*", which supports poverty-stricken families;
- supplying electricity to the Écoles du Monde secondary school in Besely, Madagascar, which provides students in rural areas with a proper education.

These projects are developed by French associations for the benefit of local communities in developing countries.

The "*De l'énergie pour informer sur la Covid*" Covid information project run with the SunPower association equipped 50 health centres in Togo with photovoltaic kits, providing them with lighting and access to information through televisions and radios. The effectiveness of the Emergency Fund quickly set up to tackle the health crisis meant that these 50 kits could be installed in June 2020, helping medical staff to inform rural populations about the virus and the importance of protective measures and treat them in better conditions.

3.4.3 Responsible development of industrial sectors

The Group is committed to contributing to the development of the industrial sectors needed for the energy transition (marine energies, offshore wind power, floatovoltaics, batteries, hydrogen, etc.) or their revitalisation (nuclear) by redeploying the necessary skills, developing skills and setting up support, retraining and protection schemes for employees for a just transition.

3.4.3.1 Adaptation of skills: the excell plan

The excell plan aims to enable the French nuclear industry to restore the most stringent standards and the highest levels of quality and excellence to be at the forefront of nuclear projects. This is a major priority as nuclear power still has an important role to play in tackling climate change, as it is a low-carbon power source. The commitments made in December 2019 have either been met or are on track. The EDF group and the nuclear sector have made 25 new commitments for mid-2021 (see section 1.4.1.1.1 "The excell plan": improvement priorities).

Given the specific challenges in terms of skills and quality, a welding plan has been created, to support the training and qualification of welders employed to work on nuclear sites. EDF and the entire nuclear sector are now entering the second phase of the excell plan, involving an effective roll-out in plants, engineering centres, sites and nuclear power plants.

Skills are a key component of this plan and much progress was made in 2020, along with commitments for the future, including:

- the creation of two welding centres of excellence, in Chalon sur Saône by Framatome and in Bridgwater in the UK. A third centre is scheduled to be built in Cherbourg by 2022;
- the launch of a project to create a nuclear industry university for the entire sector;
- the roll-out of a digital nuclear encyclopaedia using a keyword search, containing content provided by EDF and Framatome expert engineers;
- the creation of career cross-overs between production, engineering, construction, manufacturing and project and cross-functional positions, to allow employees to consolidate their skills and use them for the benefit of their home entity;
- the organisation of field trips for all new hires in the new nuclear section.

These initiatives will be further strengthened and stepped up under the stimulus package, as €100 million is earmarked to provide the critical skills needed for the future (particularly in welding) and support the industrial modernisation of the sector (modernisation of industrial capacities, support for relocation projects).

3.4.3.2 Redeployment and individual support

2020 was marked by the closure of the Fessenheim site and also by the closure of various service sites. All employees affected by job cuts are given specific support. They benefit from specific schemes in terms of priority mobility (individual personalised support and financial support), external career plans and pre-retirement paid leave.

Plant closures are implemented with measures to redeploy employees within the Group and initiatives to develop new local economic activities, to offset the loss of jobs and tax revenues in the affected municipalities. For example, the closure of the Aramon thermal power plant in the Gard department, shut down in 2016, led to the creation of a 5MWp photovoltaic plant and the implementation of a programme to step up the development of start-ups for the local energy transition, called CleanTechBooster, supported by an ecological transition contract signed with the State. Likewise, the plans for the decommissioning of the thermal power plant, scheduled to take ten years, involved a consideration of how best to involve small local companies in the calls for tenders process and achieve a recovery and recycling rate for the plant's materials of more than 95% (see section 3.1.1.3.1 "Coal-fired power generation, currently representing 0.4% of the total power generation, to be reduced to 0 by 2030").

The redeployment process for employees at the Cottam site in the UK, carried out as part of an on-going consultation process, includes, for example, redeployment and support measures for employees agreeing to work in the nuclear generation or renewable energy sectors. Additionally, an extensive communication and support plan for the area has been launched for the local communities of the relevant districts, in particular the councils of the county of Bassetlaw and Nottinghamshire.

Declining departments have been supported through a specific project called My Job, designed to enhance the visibility of pools of qualified employees and solidarity between departments for EDF. In 2020, more than 500 employees found a job in line with the Group's needs and more than 2,200 employees have been redeployed since 2018 to support the transformation of the Group.

In order to break down the barriers to mobility, a major project involving all divisions and regions has been implemented to simplify processes, for example, making easier for employees to apply for certain jobs in faraway locations without having to relocate (My Local Job), or to facilitate discussions of financial (the before and after financial assessment) and non financial issues (arrival conditions).

Additionally, in the second half of 2020, the Group increased the number of regional e-forums organised, to give all employees with a functional or geographical mobility project a clear picture of the internal job market.

The EDF group also set up "EDF Impulsion" in 2020. This team of top managers seeking internal job opportunities uses its skills for the Group's business lines, to perform operational assignments. The fifteen or so managerial consultants appointed in 2020 have already completed more than 23 assignments. EDF Impulsion also provides specific, targeted support for each team member, to help them find a job matching their aspirations and the Group's needs within 18 months.

The EDF group implements a proactive approach to the mobility of its employees, through two main areas of priority:

- **Employee career paths and employability**

  In 2020, 91% of vacancies were filled internally. The re-insourcing of external sourcing and the use of agile methods delivered impressive results in 2019 as regards recruitment quality. Operating as a genuine internal head-hunting firm, this system makes it possible to source candidates from all of the Group's departments in France (EDF and subsidiaries). This method also respects the Group's employment strategy, which gives priority to internal mobility and redeployment over external recruitment;

- **Transparency and fluidity of the internal job market**

  A Group Information System on Mobility/Recruitment was set up in 2020, boosting the visibility of the internal job market for all employees. Likewise, the "RéGlo" seminars initiated in 2019 were continued over the first quarter of 2020. These seminars targeted HR staff to help them recruit and support Group mobility by explaining the wide range of regulatory aspects within the Group and will be replaced by a MOOC, early 2021, for HR and managerial staff.

Furthermore, in order to meet its needs for specific skills for the upcoming years, the EDF group introduced a scheme in 2019 for internal work-study programmes for employees undergoing retraining for positions that meet the Group's future human resources needs. 30 employees following work-study programmes were awarded a data analyst qualification, following a training course designed with Global Knowledge. Continuing on from the success of this practice, other training courses have been set up, to allow employees wishing to retrain, in departments with declining activity levels, to follow an internal training course for in-demand jobs: planners, renewable energy producer managers, business or preparation managers in the field of boilerwork and maintenance agents and technicians in the field of plumbing. New courses designed in 2020 will be launched in the first quarter of 2021 (accountants, data scientists).

3.4.4 A data-responsible company

The digital boom raises many issues of responsibility, both as regards the planet and individuals, including the most vulnerable and least connected. The two transitions, digital and energy, provide a good opportunity to rethink our use of digital technology, not to limit its development but to control it and use it as a driver for innovation and to design services reducing the carbon footprint. Infrastructure and data security is a prerequisite for a responsible digital development within the EDF group.

The Group is therefore committed to the security of information systems and tangible and intangible assets, both in terms of the technical expertise and systems required and the conduct of users, addressed through all types of awareness-raising initiatives. The Group is committed to a responsible digital transformation, reducing the carbon footprint of both the Group and its customers (billing, platforms and consulting, etc.). It also strives to improve the accessibility of information (open data), with a view to innovation and inclusion.

3.4.4.1 Digital security

Infrastructure and data security is the main prerequisite for a responsible digital development within the EDF group. These requirements are set out in Group policies safeguarding the security of information systems and tangible and intangible assets. This matter is also covered in awareness-raising activities.

3.4.4.1.1 "Information Systems Security" policy

The Information Systems Security Policy aims to guarantee the protection of information systems, which are essential to the management of the Company's assets, as well as enabling business lines to seize Digital opportunities. This policy is designed to help ensure the success of the Group's industrial projects.

3.4.4.1.2 "Security of Assets" policy

The Security of Assets Group policy sets out the principles, rules and organisation designed to detect threats, prevent risks of malicious acts liable to damage the Group's assets and limit their consequences. This policy is based on a comprehensive approach that aims to protect people and the Group's tangible as well as intangible assets.

3.4.4.1.3 "Data management" policy

In addition, the Group has adopted a "data management" policy to enhance the value of data and organise its governance as a major strategic asset, with a view to sharing it and identifying its added value. This is a strategic priority for the Group, identified in the CAP 2030 project, focusing on the creation of new services. The data management policy distributed and applied within the Group introduces the core principles, the requirements and the recommendations made to management to meet this aim. This policy restores the balance between defensive protective guidelines (Information Systems security, assets to be protected against malicious attacks), regulatory or legal guidelines (personal data protection) and a proactive approach to value creation, striving to produce new knowledge.

3.4.4.1.4 Assimilation and cybersecurity passport

In addition to the adoption of these policies, EDF has implemented assimilation and awareness-raising initiatives on cybersecurity and privacy [(1)], designed to provide information about the measures taken by the Group to identify and prevent risks and the potential impact of any failings.

Several levels of action are superimposed for different audiences and business lines:

- the "cybersecurity passport", teaching users about good practice in terms of cybersecurity and information protection. It is mandatory for managers of EDF SA entities and will become mandatory in 2021 for foreign subsidiaries. The success rate is one of the key indicators regularly monitored by the Group's cyber department and is published in the Group's cybersecurity dashboard;

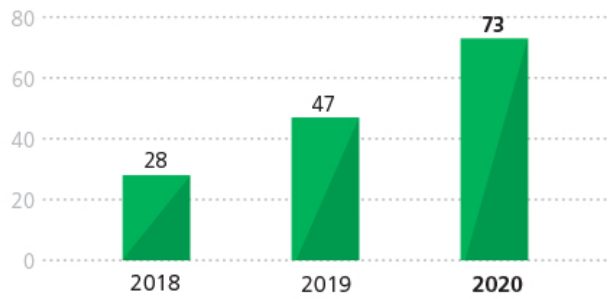
(1) Further information about personal data protection can be found in section 3.3.2.2.6.

- tests and e-learning, coupled with regular information campaigns in the form of factsheets and updates in this area, in addition to tailored training courses, for the various business lines or sectors.

3.4.4.2 Responsible digital transformation

Through the development of digital tools, the EDF group has stepped up its efforts to reduce the carbon footprint of both the Group and its customers. It also improves the accessibility of information, with a view to innovation and inclusion. The rapid increase in the number of visits to digital consumption monitoring platforms is clear evidence of this customer-side development.

Number of visits on digital consumption monitoring platforms (millions)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

3.4.4.2.1 Digital technology as a vector for responsible action

The teams of the Transformation and Operational Efficiency Department (DTEO) provide electronic signature services and all types of remote collaboration services, significantly cutting the need for business travel.

By signing the "Responsible Use of Digital Technology Charter", EDF has strengthened its goal, by formally committing to develop sustainable, inclusive and value-creating digital services. Initiated by the Institut numérique responsable (French Institute for a Responsible Use of Digital Technology) with the support of the French Ministry for the Ecological Transition, this charter is used by the Transformation and Operational Efficiency Department to structure its approach and compare its policies and results with those of other companies. The idea is to cover all issues arising from a responsible use of digital technology.

At the end of 2020, the EDF group decided to release its public data, in particular its consolidated financial statements, non-financial performance indicators, the Group's installed capacity, the corresponding generation figures and operational data such as EDF Hydro's average daily river flow data. It is released through an open data platform. This initiative was proposed by employees directly, as part of the "Let's talk about energy" dialogue process (see section 3.5.1.1 "Listening practices"). The Group data is provided in a reusable, convenient format. This Group open data platform [1], initially for employees only, was opened up to the general public during the Electric Day.

In addition to the digital solutions developed and made available to customers to improve energy efficiency and comfort (see, also, section 3.1.4 "Development of uses of electricity and energy services"), the Group has also implemented digital innovative technology in the regions. Data management is a key factor in the process of identifying low-carbon potential and supporting energy transition in communities. The data expertise of EDF and its subsidiaries is shared at all stages of the services that local authorities provide:

- as part of a wide range of digital solutions, for example, EDF has released an online module allowing users to generate an initial energy review in just two clicks and identify their low-carbon potential by displaying their energy consumption, CO_2 emissions and local renewable energy potential. This is merely a first step, followed by a more comprehensive energy review, integrating details about transport and building use or additional energy poverty data [2];
- recently, a start-up called Proxity, an EDF group subsidiary since January 2020, has developed a digital solution combined with local events for towns and a set of services for retailers and local authorities: support for promotional events in stores, local consumption data and assessments of pedestrian flows. A "Pass Proxity" is proposed, helping to promote local, sustainable consumer practices. Developed in Auvergne, this new service is well suited to towns with over 5,000 inhabitants.

3.4.4.2.2 Sensible use of digital tools

The carbon footprint of digital technology can only be reduced through a sensible use of IT and telephone systems. EDF is striving to reduce their environmental impact by extending the useful life of its hardware and favouring the circular economy. The programme initiated by EDF's Transformation and Operational Efficiency Department covers the entire lifecycle of terminals, from their purchasing (sometimes already recycled) to their recycling.

The average electricity consumption per server operated by the Transformation and Operational Efficiency Department was halved between December 2013 and December 2017 from 0.427kWh/server to 0.214kWh/server.

Digital technology will only be responsible and sustainable if it is also accessible and inclusive. Everyone should have access, without any discrimination, to digital information and functions but for this, progress must be made in the following three inseparable areas: the IT work environment, applications and digital content. EDF's IT operator has been working on this for several years, to pave the way for a range that promotes digital accessibility and uses suitable peripherals and software (zoom, speech synthesis, etc.) in a manner that ensures a high level of working comfort for users, particularly those with disabilities.

Digital applications are designed using development rules to facilitate their perception, understanding, interaction and use from adapted workstations. These standards are being integrated into the common application development practices (UX Design), focused on the user experience. Digital content design guides are available for communications and digital training.

In December 2019, EDF ranked second in the "eCAC 40" [3], a leading annual ranking measuring the level of progress by groups on the index, plus other big French businesses, in terms of their digital transformation. This level of performance is driven by excellent results in categories covering the Company's digital culture, management models, and level of technological expertise.

(1) opendata.edf.fr/explore/dataset/indicateurs-de-performance-extra-financiere/table/
(2) edf.fr/collectivites/transition-energetique/bilan-energetique-de-votre-territoire?step=1
(3) Les Échos Executives, 13 December 2019, "*EDF: acteur de premier plan en matière de transformation digitale*" (i.e. EDF: leading light in the world of digital transformation)

3.5 CSR governance

The CSR governance structure is based on venues for information and forums for dialogue that strive to constantly improve the identification and assessment of the risks and opportunities specific to each issue and each commitment. This constant identification endeavour is buttressed by a complete organisational system that supervises the implementation of the Group's commitments.

3.5.1 Listening and understanding the issues

The practice of conducting customer satisfaction surveys has been extended to all departments and relevant subsidiaries. This practice serves as a tool for designing and managing offers, and inspires action plans with the goal of continuously improving customer service. EDF also has access to the most advanced discussions and research on sustainable development through think tanks, partnerships [(1)] and various research institutes. More broadly, EDF systematically implements tools that promote listening, dialogue and understanding of its environment using a wide range of instruments, from opinion barometers to forums for listening to stakeholders and employees implemented in the form of ongoing surveys or organised in connection with institutionalised dialogues.

3.5.1.1 Listening practices

Trend surveys

EDF launched this year the second edition of ObsCop, the Observatoire climat et opinions publiques (*i.e.* French climate and public opinion monitoring survey), which is a poll organised by IPSOS in 30 countries based on a representative sample of 24,000 people. Its aim is to produce an international overview of opinions, knowledge, expectations and levels of public engagement regarding climate change in order to provide food for thought and contribute to the constructive identification of solutions for the future. The results of this study were presented on 1 December 2020 at the "Electric Days [(2)]", which the Group organised, and which featured Valérie Masson-Delmotte, a paleoclimatologist and co-chair of IPCC Working Group 1, as keynote speaker. The full results are available as open data to allow anyone, particularly researchers, to use them [(3)].

In 2020, EDF initiated an energies survey, which was conducted on a representative sample of 2,000 persons and was carried out through face-to-face interviews. Its results were presented to the Group's Executive Committee and contribute to a more comprehensive understanding of societal issues. Other surveys are also repeated year on year, including the poll of local residents living near nuclear generation, classic thermal, and hydropower facilities [(4)] which, since 2009, has aimed to measure the perception of local residents of facilities and energy,

The Internal Environmental Survey (BIPE) is carried out with a sample of EDF and Enedis employees [(5)] on those same subjects [(6)].

"Let's Talk Energy"

In 2018, the 101,000 employees of EDF and its subsidiaries in France (excluding Enedis) were invited for dialogue on the Company's strategic vision ("Let's Talk Energy"). The resulting 20 challenges are currently being implemented, including the appointment of employee ambassadors to encourage adoption of the solutions [(7)]. In 2019, Let's Talk Energy gave employees the chance to share their thoughts on the implementation of the multi-year energy programming law and to consider the Company's *raison d'être*. Some 1,400 proposals were made concerning the corporate *raison d'être*, which revealed the main themes that served to formalise the *raison d'être* (the planet, well-being, development, innovation, performance, etc.). With the help of artificial intelligence tools, employees were able to analyse the proposals in greater depth and submit their "favourites" before the Executive Committee, at the conclusion of two dedicated meetings, approved the summary formulation chosen for the Group's *raison d'être*. This formulation was presented to the Board of Directors on 27 February 2020 and was adopted by the Shareholders' General Meeting on 7 May 2020.

Y Project

The "Y project" involves 30 employees aged under 35 each year. Their goal is to accelerate EDF's transformation, using digital technology as leverage, to challenge traditional practices. Employees enjoy extensive freedom to implement practical initiatives. In 2019, employees were able to help define the Group's *raison d'être*. The climate, protecting the environment, and the general interest were all widely-mentioned topics.

My EDF group

Since the first "My EDF group" internal engagement survey conducted in November 2012 involving all Group employees, a plan to report results to employees are systematically implemented. The companies are drawing up action plans to increase or introduce improvement measures based on the results observed within their scope. It is available in all the Group's languages, including English. The results that can be exploited at the level of each company can be explained using various social and demographic criteria (gender, seniority, professional category, etc.).

The 9th edition of the survey was taken from 3 November to 1 December 2020. A major internal communication campaign was organised to encourage employees to express their opinion (videos, posters and communication kit). The questionnaire was simplified 3 years ago (streamlined from about a hundred questions down to around 40 questions). In addition, questions concerning the Covid were added this year.

Overall, the survey shows that results are improving, in particular due to the work undertaken in areas highlighted by My EDF surveys in previous years. This is the case, in particular, for accountability, which increased from 74% to 79%, and positive opinions of IT tools and equipment, which rose from 41% to 50%. Relational indicators also improved: 86% of employees (+5%) stated they are proud to work in their entity. Employee engagement increased to 69%, compared to 64% last year. Confidence in local management continues to grow, with 70% of respondents expressing positive opinions (+10 points) about its ability to clearly explain current projects and issues.

Employee participation (78% and nearly 115,000 respondents), a marked increase from the first year (63%), demonstrates the interest of Group employees in this survey over time and guarantees reliable results, as shown by the concrete and noticeable actions taken on the basis of the results.

(1) See section 3.5.2.5.8 "Partnerships".

(2) Initiated in 2017, each edition of the "Electric Days" event presents the latest innovations for moving towards an energy model with lower CO2 emissions and that is more efficient and environmentally friendly.

(3) The results were covered by the media and are also available at www.edf.fr/observatoire.

(4) Nineteen nuclear generation sites, 6 fossil thermal sites, 14 hydropower sites and 2 nuclear sites under decommissioning (Creys-Malville and Brennilis) were the subject of this survey in 2018.

(5) Enedis is an independently managed subsidiary.

(6) There are many other initiatives to listen to customers. Examples include consumer associations that are regularly listened to by the Commerce Department, Citelum or SEI; "*Ma Rivière et Moi*", a digital platform for exchanging information and multiservice data developed by EDF Hydro.

(7) This initiative received the participation and consultation trophy on 19 November 2018, organised by the Gazette des Communes and the Décider Ensemble association under the auspices of the Ministry of Ecological and Solidarity Transition, the National Public Debate Commission and the Commissioner-General for Sustainable Development.

3.5.1.2 Stakeholder panels

For over 20 years, the EDF group has relied on different external stakeholder councils, at corporate, country and subsidiary level. Several panels of experts from civil society provide Group managers with their view on the major topics of interest to EDF. This is a powerful tool for listening and understanding the environment to which EDF, a pioneer in this field, attaches great importance. The recommendations of these Councils are a source for the Group's focuses for consideration.

For example, the EDF group's Sustainable Development Council, which reports to the Executive Director for Innovation, Corporate Responsibility and Strategy, produced the "stakeholders" focus of the Group's dual materiality matrix, which was revised in 2020. The identification, selection and prioritisation of non-financial issues from the stakeholders' point of view were directly integrated into the materiality matrix presented in the introduction to this chapter 3. After eight years of operation, this Council, comprising fourteen external personalities representative of the EDF group's major environmental, social and societal issues, has been replaced by the Stakeholder Council, whose first working session on 27 January was devoted to the Group's *raison d'être* and its link with the CAP 2030 strategy for an integrated CSR policy. The subjects considered by this multidisciplinary, joint and voluntary Council include solutions based on the nature of the duty of care.

In a similar manner, the recommendations of the stakeholder panels coordinated by EDF are taken into account:

- the EDF Scientific Council, chaired by Sébastien Candel, Chairman of the Academy of Sciences, met three times in 2020 to discuss the international R&D activities, biodiversity and EDF's R&D orientations. The session devoted to EDF's international R&D led to a recommendation by the Council to more frequently head large-budget collaborative projects with a view to increasing the share of grants. This recommendation was followed by the implementation of a specific "Green Deal" project, comprising the Brussels R&D team, and reinforced by several researchers of international renown, which focuses on preparing calls for tenders for the "Horizon Europe [(1)]" programme;
- Edison's new Stakeholder Advisory Board (SAB) worked on the materiality analysis of high-stake non-financial issues. Eight priority topics emerged, which were validated by the Board of Directors and integrated into the subsidiary's management.

  Along similar lines, Edison set up an intergenerational listening and exchange network bringing together older members of staff and young people from the Millennial and Z generations. The workshops held in 2020 generated proposals about Edison's contribution to the UN's Sustainable Development Goals.

  In a similar manner, in December, Nam Theun 2 worked with 200 young people in Laos to encourage the adoption of these Goals, with the aim of identifying concrete projects that can be transposed to local communities;
- in 2017, EDF and Usbek & Rica magazine created an EDF Council of Future Generations, with the aim of innovating in terms of dialogue with civil society to tackle the sensitive issues at the heart of the energy transition and business transformations. Due to the health crisis, only one session was held in 2020, which focused on working towards inclusive mobility compatible with the climate emergency and seeking concrete solutions to collectively advance UN Sustainable Development Goals (SDGs) 11 (ensure that cities and human settlements are inclusive, safe, resilient and sustainable) and 13 (take urgent action to address climate change and its impacts);
- in addition, Enedis' Stakeholder Council met three times to discuss the nature of Enedis' external commitments, the management of the Covid crisis, the new industrial and human project and the outlook to 2050. The minutes of the conclusions of each Council meeting are shared with the members of Enedis' Executive Committee. The three prospective scenarios to 2050 currently under study were selected on the basis of the Council's recommendations.

3.5.2 Mastering the issues

3.5.2.1 CSR commitments

Following a broad internal and external consultation, the review of the Corporate Responsibility Objectives in 2020 led the Group to increase the transparency of the CSR structure by focusing it on four key issues derived from its *raison d'être*:

- carbon neutrality and the climate;
- preserving the planet's resources;
- well-being and solidarity;
- responsible development.

These four key issues are further broken down into sixteen commitments (four per key issue), which are linked to the Group's materiality matrix [(2)] and which cover all major issues of the Group's CSR policy. They are in line with the previous Corporate Responsibility Objectives (CROs) [(3)], which they extend, supplement and clarify. For example, they make more explicit EDF's commitment to human rights, relations with local areas and digital development.

These four key issues break down into 16 EDF group CSR commitments:

CARBON NEUTRALITY AND CLIMATE
- Ambitious carbon trajectory
- Carbon offset solutions
- Adapting to climate change
- Developping electricity use and energy services

PRESERVING THE PLANET's RESOURCES
- Biodiversity
- Responsible land management
- Integrated and sustainable water management
- Waste and circular economy

WELL-BEING AND SOLIDARITY
- Health and safety of all
- Ethics, compliance and human rights
- Equality, diversity and inclusion
- Energy poverty and social innovation

RESPONSIBLE DEVELOPMENT
- Dialogue and consultation with stakeholders
- Responsible development of local areas
- Development of industrial sectors
- Responsible digital development

(1) European Union Framework Programme for Research and Innovation for the 2021-2027 period.
(2) See "Issues and commitment, EDF group's materiality matrix", chapter 3, introduction.
(3) Adopted in 2016.

3.5.2.2 Group policies

3.5.2.2.1 The Corporate Social Responsibility Policy

On 7 May 2020, the EDF group formulated its *raison d'être*, which breaks down into 16 CSR commitments divided into four key issues each (see the introduction to chapter 3), and on 7 December the Group's commitment to carbon neutrality took concrete form with the validation by the Science Based Targets initiative of a new "Well Below 2°C" trajectory for reducing the Group's direct and indirect CO2 emissions (see section 3.1.1 "The Group's carbon trajectory"). To date, nearly two-thirds of the projects undertaken in connection with the CAP 2030 roadmap are directly tied to the carbon neutrality objective. It is in particular to take note of these important developments that the Group has reviewed its sustainable development policy and renamed it the CSR Policy.

The Company's environmental, social and economic performance is driven in the first place by the contributions of the various entities. The CSR policy provides a framework for these actions by formulating common requirements and action principles. In addition to regulatory compliance, the requirements of this policy endeavour to implement the 16 CSR commitments as concrete proof of the deployment of the Group's corporate *raison d'être*. It applies to all Group entities and defines the priorities for 2030 at the Group level, which each entity implements taking into account its specific activities and challenges, in line with the principle of subsidiarity. Where appropriate, an entity may choose to supplement the requirements of this policy.

3.5.2.2.2 Other CSR policies

In addition to the Sustainable Development policy, other Group policies focus on other specific aspects of corporate responsibility (HR policies, Procurement policies, Ethics & Compliance policy, Nuclear Safety policy, etc.). Corporate responsibility policy is progressively being implemented in all the Group's fields of business.

3.5.2.3 Governance of corporate responsibility

3.5.2.3.1 Board of Directors

The duties, powers, composition and operation of EDF's Board of Directors are described in detail in chapter 4, section 4.2 "Composition and operation of the Board of Directors". The Corporate Responsibility Committee, as one of the Board of Directors committees [(1)], examines, in connection with the Group's strategy, the Group's commitments and policies, as well as their implementation, in terms of ethics, compliance, and corporate responsibility. For more information, see section 4.2.3.4 "Duties and activities of the Board's CR Committee in 2020."

3.5.2.3.2 CSR Strategy Committee

The CSR Strategic Committee, which is composed of the Group's Executive Directors, conducts an in-depth review of all CSR issues, for which it provides strategic management and coordination. The Committee was created in 2019 and is chaired by the Executive Director for Innovation, Corporate Responsibility and Strategy. In 2020, the CSR Strategic Committee met three times and focused, in particular, on the new CSR structure in light of the Group's raison d'être, the Group's new commitments in terms of biodiversity, the biomass policy, the duty of vigilance in Mexico, the carbon neutrality passport and reverse factoring. With regard to the issue of how the raison d'être should be applied in the business lines and in the territories, the CSR Strategic Committee approved the conditions for harmonious deployment in the business lines and units, coordinated by the regional action delegation. Depending on the agenda, the conclusions of the meetings are reported to the Board of Directors [(2)].

3.5.2.3.3 The Sustainable Development Department

It reports to the Executive Director, Innovation, Corporate Social Responsibility and Strategy, a member of the Executive Committee.

It contributes to the Group's strategic transformation by accompanying business lines and projects:

- in specifically taking into account environmental and social issues (opportunities and risks);
- with respect to business choices and actions, in particular by integrating the four key issues derived from the *raison d'être* in the strategic supervision of the operational entities; and
- in screening new projects from the point of view of sustainable development [(3)].

It is particularly responsible for monitoring the Group's target for reducing direct GHG emissions "scope 1" [(4)].

Its aim is to represent a differentiating factor for the Group's performance, as a responsible company and while respecting the management independence of network managers, that creates value for all stakeholders (employees, shareholders, customers). It coordinates sustainable development in the Group: corporate coordination of the business lines and subsidiaries through the SDC [(5)] (Sustainable Development Committee), coordination of the dedicated internal networks such as the EMS and the predictive watch networks (see sections 3.5.2.5.2 "The environmental management system (EMS)" and 3.5.2.5.3. "Predictive watch networks"), coordination of relations and dialogue with external partners. It brings together and coordinates the expertise necessary for taking into account sustainable development issues, and implementing of the Corporate Social Responsibility Goals.

3.5.2.4 Social dialogue

3.5.2.4.1 International and European social dialogue

Global CSR agreement

The Group's actions go beyond merely integrating environmental issues into its strategy, as EDF remains a socially-responsible, committed employer and a leader in terms of the professionalism and involvement of its employees, by building their skills and fostering greater workforce diversity. The EDF group's Corporate Social Responsibility was signed in 2018, and sets out the major principles to be respected in several areas:

- respect and integrity;
- people development;
- dialogue and consultation;
- support for local residents and the impact of the Company's policies on local regions.

All Group employees and subcontractors worldwide are covered by the provisions of this agreement, which the Group's subsidiaries apply by including it in their strategic action plans and incorporating it into their progress approaches. The global framework agreement is implemented within the Group's subsidiaries by the action plans they develop and on which they will report in 2021.

In 2020, the trade unions were involved in developing the Group's new vigilance plan (see section 3.6 "Vigilance plan"). Work was carried out in 2020 on the Group's CSR commitments for the purpose of producing an *ad hoc* document that will be published in 2021.

Local projects reflect the vitality of this agreement within the organisations. The agreement serves as a vector for social dialogue (for example, the dialogue initiated at the Chinon power plant), policy development (digital accessibility) and innovation (such as "Icovet" a circular economy project involving work clothing). The CSR officers of the divisions and subsidiaries request the social dialogue department's assistance in implementing action plans and communicating with the trade unions at the CSR Dialogue Committee meetings in the event of an alert.

(1) Internal rules of procedure of 8 October 2019.

(2) Through its Social Responsibility Committee.

(3) See section 3.1.2.2 "Integration of the corporate responsibility goals into the Group's strategic process and project screening".

(4) See. section 3.4.2 "Methodology".

(5) In 2018, the SDC met five times. It reviewed the carbon trajectory, the biodiversity agenda, the organisation of non-financial reporting and the Group's Environmental Management System.

European Works Council (EWC)

The European Works Council, which comprises 37 representatives of the employees of the parent company and of the French, German, British, Italian, Belgian and Polish subsidiaries, met twice. In 2020, discussions focused on recurring issues: Group current events described by EDF's Chairman and CEO, health, safety, review of the Group's consolidated financial statements and employment report. The Council also considered the Group's gas strategy, renewable energies and hydrogen technology, issues raised by European policies, the Green Deal, taxonomy and Brexit. Reorganisation projects and their impact on employees discussed included the disposal of Edison's exploration and production activities, the acquisition of a Rolls Royce subsidiary by Framatome and the disposal of Reetec, a German subsidiary of EDF Renewables.

The functioning of the Council was impacted by the health crisis, which forced the June plenary meeting to be postponed until September. All discussions, whether in working groups, at the secretariat level or at plenary meetings, were conducted remotely. An extraordinary EWC secretariat meeting was held in June to share information on the decisions adopted by the Group on protecting employees' health and safety, the significant expansion of telework and the social dialogue associated with this period within the various Group subsidiaries. Work was also undertaken with EWC representatives in connection with the "Working Differently Managing Differently" (TAMA) project launched following the first lockdown period in France.

Through the five working groups set up, the EWC employee representatives carry out work at the European level in connection with Group policies (*e.g.* health and safety, equal opportunity and diversity). In late 2020, the working group on the closure of industrial sites, which was set up in 2019, produced a set of recommendations and proposed issues to be studied if an industrial site is closed.

In accordance with the collective agreement on the establishment and operation of the Council, the members reappointed the Council's Secretary by a majority of the votes cast in an election held electronically on 5 November 2020.

3.5.2.4.2 Social dialogue in France

In France, highlights in 2020 included setting up the Social and Economic Committees (SCEs), following the trade union representative elections held on 14 November 2019, and the implementation of the agreements negotiated in 2019 on the operation of the Central SCE, establishment SECs and trade union rights. This implementation is a component of the "Social Dialogue 2020" project on the renewed social dialogue within EDF, which aims to simplify and improve the performance of social dialogue.

In the context of the health crisis, EDF has set up an enhanced social dialogue with employee and trade union representatives at all levels of the Company (establishments, department, company and group). This ongoing dialogue, which focuses on transparency, is a forum for exchanging views on the management of the crisis and the implementation within the Company of the measures adopted by the public authorities. The manner in which the social dialogue is conducted has been temporarily modified, firstly, pursuant to consultation with the Central Trade Union Representatives (recommendations of 27 March 2020) and, thereafter, under the collective agreement on employee protection and social measures in connection with the relaunch of EDF's activity.

2020 social agenda

The oversight process for implementing collective agreements provided for in the 2018 Group HRD [1] organisational decision was initiated in order to assess the impacts of the agreements negotiated and to consolidate the agenda of the collective agreement monitoring committees (including the worldwide framework agreement on the EDF's group Corporate Social Responsibility).

To take into account the context of the health crisis, the Social Dialogue Director and the Central Trade Union Representatives met three times (on 20 April, 5 November and 3 December) in order to adjust the social agenda, thereby preserving the Company's collective bargaining momentum. Most of the negotiations included in the 2020 social agenda have been completed or initiated, with two exceptions that have been postponed to 2021 (workplace gender equality and profit-sharing). In 2020, nine agreements and supplemental agreements were signed. Collective bargaining was particularly intense for EDF SA during the first lockdown and post-lockdown period.

Two agreements and one amendment were concluded unanimously:

- collective agreement on employee protection and employment measures in connection with the relaunch of EDF SA's activity was negotiated during the first lockdown period and signed electronically on 3 June 2020; an amendment to extend this agreement was signed on 22 December 2020;
- method agreement on the work to be carried out in connection with the feedback on the 2020 health crisis and the TAMA project was signed electronically on 3 August 2020.

In addition, six other agreements and amendments were concluded within EDF SA on:

- quality of life at work: an amendment to extend the 2017-2020 agreement on workplace gender equality within EDF SA was signed on 26 June;
- employee savings plans: amendment no. 2 to the agreement of 17 July 2009 on the EDF group's retirement savings plan regulations and amendment no. 19 to the agreement of 29 November 2004 on the EDF group's corporate savings plan regulations signed on 3 December;
- remuneration: a collective agreement on EDF SA's 2020 profit-sharing plan was signed on 6 August and a collective agreement on EDF's 2021 contributions to the PERCO and PEG employees savings plans was signed on 6 August;
- continuing the "2020 Social Dialogue" project launched in May 2018 on the reform of social dialogue at EDF SA as a whole: amendment no. 1 to the collective agreement on the career path of employees holding representative and/or trade union mandates of 25 July 2017 was signed on 16 October.

Company Consultation and Coordination Body (Instance de concertation et de coordination de l'entreprise or "ICCE")

The ICCE is a forum for social dialogue, exchange and/or consultation with EDF SA's representative trade union organisations, led by the Group Social Dialogue Director. Its role is to discuss societal and development issues that do not fall within the remit of employee representative bodies or emerging issues, decisions or policy orientations. In 2020, five meetings were held (only one with members in physical attendance).

The year was also marked by the aim to prepare more frequent progress reports on projects that been presented a first time to the ICCE, whether concerning external issues (government pension reform project) or internal issues (interim progress report, milestone report on the reference project, Let's Talk Energy approach, etc.).

Employee Representative Bodies (ERB)

In 2020, the new employee representative bodies created by the collective agreements signed in the summer of 2019 were established within EDF SA. The structure of the Employee Representative Bodies has been reformed and now includes 47 site-level Social and Economic Committees, one Central Social and Economic Committee and one France Group Committee.

Central Social and Economic Committee (CSEC)

The Central SEC, which was established in December 2019, comprises 25 employee representatives and 4 trade union representatives, and has a high turnover rate among these representatives. In 2020, highlights included the implementation of a new method of operations, the management of the health crisis, the protection of employee health and safety, and business continuity issues. Five meetings were held remotely and five with the members in physical attendance.

France Group Committee

The France Group Committee is a forum for dialogue at the Group level in France, comprising 28 employee representatives of the Group's subsidiaries (EDF, Dalkia, EDF Renewables, Framatome, Enedis, Cham, RTE, etc.). France Group Committee met twice in 2020 (out of the three meetings pursuant to the agreement) to discuss the Group's financial and economic position, its policies, and the Group's employment and training reviews.

The Employment, Training, Work Placement and Mobility (EFAM) working group and the Regional Social Dialogue Committees on Employment, Mobility and Work Placement (IDREM), which are provided for in the CGF agreement, were set up in 2020. The last meeting of the year, which was scheduled for December, was postponed to January 2021 and will examine the Group's strategic choices and review the operating methods and work of the IDREMs.

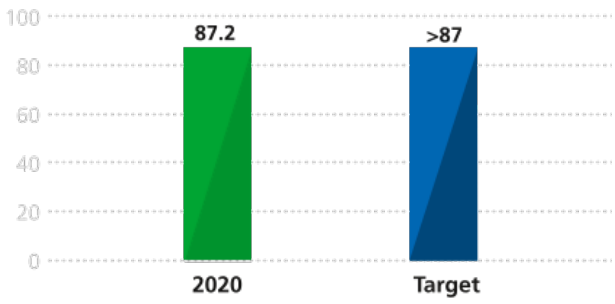
(1) "Overseeing collective bargaining at EDF SA".

3.5.2.4.3 Social dialogue metrics

The Group's commitment [1]

The social dialogue indicator selected at the Group level measures the existence of collective agreements in the key companies controlled. While taking into account certain particularities encountered internationally, the commitment aims to place the social performance measured by this indicator at a rate of over 87% of employees covered in the consolidated scope.

Rate of employees covered
by a collective bargaining agreement (%)



Key non-financial performance indicator
The methodology for this indicator is set out in detail in section 3.7.2.2 "Details on performance indicators".

Qualitative measurement of social dialogue

On a qualitative level, the CSR Agreement Monitoring Committee oversees the implementation of the CSR action plans in the Group's divisions and subsidiaries. In order to better respond to the strategic challenges of each business line, these action plans are not standardised, but must comply with certain methodological principles designed to promote continuous improvement.

3.5.2.5 Transformation drivers

3.5.2.5.1 Integration of the commitments into the Group's strategic process and project screening

The commitments are implemented and set out in screening letters specifying the contribution of each of the Group's entities and subsidiaries to the achievement of the common objective. The system for monitoring these commitments is integrated into the Group's strategic planning loop. Annual performance reviews allow entities and subsidiaries to monitor and control their actual performance.

Similarly, projects and investments subject to the approval of the Group's various Commitments Committees, and particularly those of the Group Executive Committee [2] (CECEG) and the International Business Development Committee (CBDI) that are the subject of a specific opinion of the Sustainable Development Department based on a screening grid that translates the issues of the Group's CSR commitments into operational terms [3]. Where necessary, the Sustainable Development Department organises due diligence investigations specific to these issues.

3.5.2.5.2 The environmental management system (EMS)

In order to implement the goals and actions based on its sustainable development commitments and policy, the EDF group has set up a Group-wide environmental management mechanism using an environmental management system (EMS). This system is ISO 14001: 2015 certified by the Afnor certification external expert, for a scope representing almost all the consolidated revenue of EDF and its subsidiaries (excluding Enedis) and shareholdings. All of industrial sites are covered by an EMS and, for all thermal, nuclear and hydropower generation sites in Europe, this system is certified. The environmental actions adopted are deployed at all entities and subsidiaries *via* implementation of the Group's SD policy goals.

3.5.2.5.3 Predictive watch networks

EDF anticipates changes to environmental and energy policies in order to take appropriate measures to guarantee regulatory compliance and manage business integration or reputational risk issues. To this end, the Sustainable Development Division coordinates a predictive watch system that mobilises and coordinates the Group's experts. This process is based on the work of thematic groups known as "watch networks": water, waste and soil, air, biodiversity, industrial risks, energy efficiency, energy poverty, health and climate change, sustainable finance. Each of these networks comprises fifteen members from different Group businesses that meet every quarter to share an overall vision. Each network works closely with the Legal, Public Affairs and European Affairs Divisions. The managers of each network meet every month as a Sustainable Development Agency which monitors the transversality of approaches and ensures that the Group's challenges are optimally taken into consideration with an overall, long-term view. EDF was considered by the InfluenceMap think tank to be one of the 17 businesses most actively supporting regulation in accordance with the Paris Agreements [4].

3.5.2.5.4 Controversy management process

The EDF group attaches great importance to identifying, preventing and mitigating the risks of serious human rights, environmental and health and safety risks in all its activities and projects. Accordingly, in order to identify and anticipate the risks of ESG (Environment, Social and Governance) controversies, EDF has set up a dual system for managing controversies:

- pursuant to its risk anticipation approach, and thanks to monitoring tools [5], EDF:
  - identifies the risks of ESG controversies in France and internationally to which its operating activities and projects may be exposed,
  - classifies these risks in consultation with the relevant entities and countries,
  - decides on appropriate measures and/or communication;
- when reacting to the occurrence of risks, EDF responds systematically and transparently to rating agencies that ask for explanations on issues they have deemed controversial. This process is applied in particular when screening projects eligible for EDF's green emissions financing.

3.5.2.5.5 Management of environmental risks

Environmental risks, including those associated with climate change, are fully integrated into the Group's EMS and internal control system in coordination with the Group risk management function. They are subject to action plans resulting from strategic priorities in the Group's sustainable development policy.

(1) This Group performance indicator is new in 2020, and has been selected in response to the Group's *raison d'être* and new CSR challenges and commitments (see theintroduction to chapter 3 and section 3.3.3 "Equality, diversity, inclusion").

(2) This undertaking concerns new projects involving investments of more than €50 million, entailing a significant impact on regions and the environment. The Group plans tolower this investment threshold to €30 million by 2030.

(3) See the high-stake non-financial issues and the materiality matrix in the introduction to chapter 3.

(4) How companies really impact progress on climate, 2019, influencemap.org/climate-lobbying.

(5) Such as RepRisk.

Identifying the environmental risks

The 2020 risk mapping [1] update reconfirmed the risk analysis and did not highlight new environmental risks. At the end of 2020, the Group has eight high-threshold SEVESO sites [2] and 32 low-threshold sites [3].

In 2020, as in previous years, the most significant factors in terms of the economic and financial challenges related to environmental risks pertain to the following subjects:

- climate change and GHG emissions;
- the impacts of EDF's activities on the air, water and soil and the production of waste;
- protection of biodiversity and services provided by ecosystems; and
- the management of water resources.

The main change concerns the observation of the effects of climate change with higher temperatures in summer and droughts increasing the pressure on both environments and some of the Group's business lines such as hydropower and nuclear activities.

Managing the environmental risks

In order to control risks of industrial incidents or accidents that could harm the natural environment or public health, EDF has implemented a Group environmental management system based on:

- an active investment policy incorporating the best available technologies (BAT) and an industrial asset decommissioning programme for assets no longer in operation, which includes decontamination operations where necessary;
- an employee training and awareness-raising programme for all stakeholders, including feedback from crises experienced and drills;
- inspections and audits at the generation sites;
- a crisis management policy which requires the regular testing of crisis systems through an annual programme of crisis response drills (see section 2.1.2.5 "Crisis management and business continuity"). The industrial incident at the Lubrizol Seveso site in France (non-EDF site) led to a change in the regulatory framework in terms of risk and hazard control and generated specific internal feedback in order to identify avenues for progress in the layout and protection of storage facilities.

In France, a comprehensive "environment – sustainable development" training programme features both business line and cross-disciplinary training focusing on themes of environmental management, standards and regulations, and environmental analysis. In 2020, 1,545 employees received training representing 12,710 hours [4]. The "environmental skills development" network contributes to forecasting and managing both skills in this field and experts' career paths.

Locally, each of the Group's operational units and companies identify events that could have an environmental impact, manage emergency situations that could result from them, conduct corresponding crisis response drills, implement monitoring and communicate on environmental events under its responsibility.

High-stake environmental event

In 2020, actions to closely supervise and monitor production processes have made it possible to avoid high-stake environmental events [5] with a significant impact on the environment. Certain operational events such as hydrocarbon leaks and alignment deficiencies in effluent transfers may result in litigation arising from complaints lodged by NGOs or associations and notices to comply issued by national regulatory authorities (ASN, DREAL, etc.). In 2020, penalties imposed on EDF totalled €500 for a 5th class offence in Flamanville.

Reduction of chemical risk

When it is technically feasible, in order to reduce the pollution risks, the Group's entities have also implemented a programme to eliminate or substitute certain chemical substances with more environmentally-friendly products. This work focuses as a priority on CMR (carcinogenic, mutagenic, or toxic for reproduction) substances or those considered worrying.

Substitute products are often environmentally certified, *e.g.* cleaning products (regarding our subsidiaries Citelum, Électricité de Strasbourg (ÉS) and data centres). Following on from the R&D studies, substitutions are implemented, such as: environmentally acceptable oils for hydraulic production, fluids for thermal and nuclear power plant turbines in France and the United Kingdom, varnishes and paints (Industrial Division, Property Management and Citelum), and the decision by the Real Estate Department to stop using pesticides.

Furthermore, EDF, Hydro, Property Management, Enedis and ÉS are continuing with their programmes to decontaminate equipment with concentration higher than 50 ppm for PCBs [6] and PCTs [7]. These action plans continued in 2020 are on target. Complete disposal is set for the end of 2025 for EDF R&D, EDF SEI, EDF PEI, Cyclife France and Dalkia. It should be noted that thermal and nuclear generation lines no longer have any equipment exceeding the threshold.

3.5.2.5.6 Compensation

Total compensation

Total compensation is a key component in recognising the contribution of every staff member to the Group's performance. It contributes to employee engagement, increases the loyalty of talent and adds to the Group's attractiveness. Accordingly, the Group is committed to offering its employees fair and competitive compensation, while paying great attention to the quality and level of social welfare it proposes, particularly in terms of cover against the major risks of life. The Group accordingly formally introduced a total compensation and fringe benefits policy. It covers all employees of the main companies controlled by the Group.

The Group's main foreign companies' compensation and social welfare systems have been reviewed based on this policy. The total compensation policy is based on four main principles: competitiveness in the external market; internal consistency and fairness; financial sustainability; and communication.

It is based on fixed compensation and individual and/or collective variable compensation which serves to recognise the achievement of objectives, connected to the companies' economic results. There is a direct and visible link between the employee's contribution and the related compensation. The Group's companies guarantee the meeting of the minimum legal or professional requirements in each country and the absence of discrimination.

EDF is reaffirming its priorities in terms of recognition and updates its policies by:

- improving the integration of recognition into its managerial practices and processes;
- strengthening the link between personal contribution (performance, ability to adapt and take the initiative) and financial recognition; and
- developing variable compensation schemes, linked to the Company's financial performance, to recognise through differentiation.

Lastly, to meet the challenges of employee and manager recognition, a project to modernise the pay classification system for the Electricity and Gas Industries branch was launched in 2019 and will continue in 2020 and 2021.

For total gross remuneration, please refer to the note on employee expenses.

(1) See section 2.1.2.1 "Risk mapping and the report on the control of activities and risks".

(2) These sites include Bellefontaine B, Pointe Jarry, East Port and Jarrie in France, Hole House in the UK, and Collalto, Cellino and San Polito in Italy.

(3) Upper and lower threshold: industrial establishments are "Seveso" classified according to their technological risk depending on the quantities and types of hazardous products they handle. There are two different thresholds which classify establishments as "Seveso low-threshold" or "Seveso high-threshold". The requirements vary significantly between these two types; they are very restrictive for the high-threshold, particularly with regard to the safety management system, informing the public and the prevention plan, etc.

(4) Within the scope of EDF SA.

(5) High-stake environmental event: an event causing serious environmental damage (areas, resources and natural environments, sites and landscapes, air quality, animal and plant species, biological diversity and balance) combined with extensive media coverage or a financial impact of more than €3 million. An event causing environmental damage and likely to affect human health falls within the scope of a high-stake environmental event for the EDF group.

(6) PCB: Polychlorobiphenyls.

(7) PCT: Polychloroterphenyls.

Variable compensation plans to boost performance

Within the Group, most employees have individual or collective performance-based variable compensation. The terms and conditions of this variable compensation differ from one Group company to another, based on historical agreements and the applicable regulations. At EDF SA, all employees may receive performance-related variable compensation. For managers, the variable share is based on both individual and collective targets whose weighting increases with the position within the Company.

EDF and Enedis pay special attention to the professional training of their managers on issues of compensation. In France, EDF and Enedis employees benefit from a profit-sharing scheme, introduced more than 20 years ago in the case of EDF and for Enedis when it became a subsidiary. Most of the Group's European subsidiaries have similar schemes. EDF and Enedis employees can choose either to receive payment and/or to invest it into either the Group Corporate Savings Plan or the Group Collective Retirement Saving Plan. In a restrictive economic environment, the policy of an employer contribution for sums invested has been maintained The EDF and Enedis profit-sharing agreements are three-yearly (except for 2020) and require the profit-sharing amount payable to be set based on the meeting of national objectives reflecting the different components of the companies' performances (economic, business lines, social and environmental).

A successful comprehensive employee savings policy

It is open to employees of EDF and of the Group's French companies in which EDF owns directly or indirectly at least 40% of the share capital and which have signed up for the Group Corporate Savings Plan. At 31 December 2020, approximately 200,000 employees, retirees and former employees of the Group held a Group Savings Plan (*i.e.* over 97% of the total population). Over 83,000 employees, retirees and former employees of the Group hold a Group Retirement Savings Plan (*i.e.* over 40% of the total population).

The Group corporate savings plan

A full range of diversified mutual funds is available for subscription, including conservative funds mainly invested in bonds and money market investments, balanced funds and dynamic funds, mainly invested in shares, including shareholding funds invested in EDF shares. The EDF group's corporate savings plan totalled €5.2 billion at the end of 2020. Profit-sharing, as well as individual payments and transfers from the Time Savings Accounts, are matched by the Company under conditions negotiated within each company.

Collective Retirement Savings Plan

The EDF group's Collective Retirement Savings Plan is made up of two FCPE (Employee Mutual Investment Funds) profit-sharing funds with a total of eight investment vehicles: one solidarity fund and one set-maturity fund. The plan may be managed independently, in which case it may be invested in any sub-fund regardless of the retirement date, or by the fund manager, in which case the level of risk will be automatically reduced as the maturity date approaches (retirement, acquisition of their primary residence). Profit-sharing, as well as individual payments and transfers from the Time Savings Accounts, are matched by the Company under conditions negotiated within each company. The EDF group's Collective Retirement Savings Plan totalled approximately €1 billion at the end of 2020.

Employee shareholding

At 31 December 2020, the employees held 1.36% of the share capital, divided between the shares held by the "EDF Actions" and "EDF ORS" employee shareholding funds (FCPEs) of the Group Savings Plan and the shares held in registered form:

	Number of employee shareholders	Number of shares	% of share capital	% of voting rights
Employee shareholdings		**42,092,505**	**1.36%**	**1.41%**
Group Savings Plan ("Actions EDF" and "EDF ORS" employee shareholding funds)	94,088	38,075,245	1.23%	1.26%
Of which EDF shares	*94,088*	*38,075,245*	*1.23%*	*1.26%*
Of which EDF ORS	*39,382*	*7,307,294*	*0.24%*	*0.13%*
Shares held in registered form		4,017,260	0.13%	0.15%

3.5.2.5.7 Partnerships

Partnerships are an important commitment for the Group, which evidence its mobilisation to promote the energy transition in the local areas. These partnerships are set up in line with EDF's raison d'être and deployed in consultation with the stakeholders.

In terms of biodiversity, the Group relies on domestic partnerships built over time with major players in the sector (see section 3.3.2.1.5 "Enhancing governance of biodiversity issues and raising employee awareness"). Regarding climate and ecological and solidarity transition in the broad sense, the partnership forged with the Sustainable Development and International Relations Institute (Iddri) allows EDF to engage in discussions on issues, develop expertise and identify emerging issues.

Assisting vulnerable sections of the population in energy transition constitutes one of EDF's partnership areas, especially with the social and solidarity economy and social entrepreneurship sector. EDF therefore entered into a partnership with ASHOKA France, one of the pioneers and major players in social entrepreneurship (described in chapter 3.3.4.3 "Social innovation").

In terms of dialogue carried out in the regions of France, partnerships continue with the French coastal protection agency (Conservatoire du Littoral) and the National Union of Permanent Centres of Environmental Initiatives (Union nationale des centres permanents d'initiative pour l'environnement) on the dimension "support to local communities" and with the National School of Landscape Architecture (ENSP). Recently, the research and action work of the ENSP on the Martigues Ponteau thermal power plant has led to a diagnosis after the deconstruction of the chimneys that enhances the landscape footprint of the site in the local area.

At the local level, many partnerships are set up by the divisions and subsidiaries with a view to establishing a close dialogue with local players.

3.5.2.5.8 R&D

The EDF group's Research & Development (R&D) activities are handled on the one hand by the Research & Development Division – EDF R&D and on the other by certain Group subsidiaries. These activities are complementary and in line with the Group's CAP 2030 strategy. With the goal of carbon neutrality by 2050, and with electricity anticipated to be a major factor in the decarbonisation of the French economy, the role that R&D will play will be crucial to achieving this objective. Its areas of research focus on three main themes: the electrical transition; the climate transition; and the digital and societal transition.

In 2020, the EDF group's total R&D budget was €685.2 million. It comprises EDF's R&D budget of €518 million, as well as the research carried out by certain wholly-owned subsidiaries, mainly Framatome, EDF in the UK and Edison. In particular, expenditures covered research into energy efficiency, uses of electricity as a substitute for fossil fuels, renewable energies and their insertion into the grid, energy storage, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of disturbances (See section 1.5 "Research & development, patents and licences").

3.5.2.5.9 Responsible communication

For over 20 years, EDF has developed educational and local communication, focusing on its public service values and based on authenticity and respect. In January 2021, the EDF group ranked first in the list of the most credible companies in terms of communication, in the utilities/energy category [1].

Responsible communications programme

In 2018, the Company took a new step forward by adopting a responsible communications programme that is in line with its commitments to sustainable development and corporate responsibility, and its digital challenges. In particular, this programme aims to reduce the environmental impact of the Group's communications and to ensure communications that are respectful of all persons, as illustrated by the accessibility of all communication media to everyone. It is embodied in a responsible communication code with 50 commitments [2], which applies to communication actions and the means used (press relations, events, digital, publishing, marketing, etc.), in France and internationally, of entities whose communication policies are controlled by the Group. These actions include: reducing paper consumption, strict use of certified sustainable paper, carbon offsetting of major events, and expanded use of virtual meetings in order to limit the number of journeys causing significant GHG emissions.

In all its communications, EDF is committed to not encouraging energy waste and aims at all times to reduce consumption based on the importance of energy savings. To achieve the collective commitment of its teams, the Group's Communications Department has initiated a responsible communications training programme for the entire sector. In 2020, four meetings were held, which trained 40 communicators, bringing the total to over 200 trained communicators, i.e. more than one-third of the sector.

FAIRe programme

In addition, EDF is a signatory of the FAIRe programme (2018), which is led by the Union des marques association. This charter, which was renewed in 2020, includes 15 commitments and annual reporting, enables companies to shift to responsible communication and Union des Marques to assess their performance each year. In 2020, EDF obtained a score of 2.6/3, higher than the general average of 2.3/3 (1.8 in 2018).

Communication for the general public

The Covid pandemic profoundly changed the Group's external communication priorities in 2020. A significant portion was devoted to informing customers and the general public about the actions taken by EDF and its subsidiaries (notably Edison in Italy and EDF in the United Kingdom) to assist them in the face of the crisis:

- communication on the creation and operation of the Emergency and Solidarity Fund, which the EDF Foundation established for the most disadvantaged segments of the population and healthcare personnel;
- procedures for deferring and extending the payment of bills by business customers and small companies;
- advice throughout the summer provided to individuals on how to protect themselves from the heat and cool their homes during the pandemic (edf.fr);
- the post-crisis emergency, in partnership with public actors, providing a discussion forum for elected representatives, experts and local stakeholders.

In France, when the lockdown was lifted, EDF opted to communicate extensively on two key issues of the Group's *raison d'être*: climate change and biodiversity.

On climate change

- **Carbon neutrality**: in September, the Group's R&D department launched a vast external information campaign on its priority research topics focusing on carbon neutrality, in particular on carbon offsetting of residual CO_2 emissions through nature-based solutions (e.g. carbon sequestration in natural ecosystems, sustainable storage). In the United Kingdom, EDF in the UK launched the "Helping Britain achieve Net Zero" TV and social network campaign, which explains how electricity can help decarbonise the British economy.
- **Electric mobility**: EDF also stepped up its communication on electric mobility, an important catalyst for improving air quality and reducing greenhouse gases in the transport sector, by launching a consumer TV programme with the M6 channel to explain the advantages of electric vehicles. At the same time, the Group, through its IZIVIA subsidiary, continued its communication on the deployment of recharging stations (website, social networks, press relations). In October 2020, it signed the "Objective 100,000 terminals" charter launched by the government.
- **Energy efficiency:** press briefings on RE2020, a digital campaign on the advantages of carbon-free electric heating, and a digital event on the datacentres.
- **Renewable energies:** Dalkia has focused its communications on an educational campaign on social networks (#green start), to promote a better understanding of the role of renewable and recovered energies (geothermal, wood energy, wave power, recovered energy, biogas) in energy systems. In addition, EDF Renewables' educational campaign on social networks highlighted the advantages of photovoltaic panels: tonnes of CO_2 avoided, production capacities, recycling conditions.

On biodiversity

- **Nature Festival:** EDF has been a partner of "Fête de la Nature" (i.e. "Nature Festival"), a government-funded project, since 2008, particularly via the French Biodiversity Agency (AFB), the French Ministry for the Ecological & Inclusive Transition, and IUCN 1. In 2020, for the 14th edition branded "Let's take it from the seed", EDF's business lines organised 35 events and received nearly 1900 visitors. In the context of the health crisis, this operation was supported by communication on social networks (over 40,000 printouts and 5,000 media views broadcast). This operation was an opportunity for the Sustainable Development Department to prepare a communication kit on the Group's biodiversity challenges, which was relayed by the entire communication chain. Through the "Companies Committed for Nature – act4nature France" initiative, EDF is committed to continuing its historic partnership with the "*Fête de la Nature*" until at least 2022;
- **Public information centres:** throughout the year, the public information centres of the industrial sites offered events focusing on biodiversity, such as raising awareness of migratory fish (Tuilières hydroelectric site); presenting the foreshore ecosystem (La Rance tidal power plant, in partnership with Natura 2000 and IFREMER); biodiversity events during the summer for children (Saint-Alban nuclear power plant);
- **Publication:** EDF published a booklet on "Biodiversity: to be or no longer to be" which, based on articles by external experts (naturalists, scientists, economists, sociologists, financiers, philosophers) explains what biodiversity is, reports on its current status and discusses the priority actions to be taken to preserve it. The document is available to all on edf.fr and will be sent to the Group's stakeholders, including the Company's individual shareholders.

Aimed at young people

For young people, EDF offers primary, secondary and high schools free conferences on electricity and sustainable development. These "Energy & climate" talks have been completely redesigned and are now conducted as interactive workshops in which students are given the task of combating climate change. Over 29,000 students attended these talks in 2020, and 99% of teachers stated they would recommend them to their colleagues. The "Energy from A to Z" pages on edf.fr aimed at young audiences and teachers (including the "plug in safe" primary education kit, tests on energy saving, understanding electrical systems, etc.) received some 800,000 unique visitors in 2020.

At the end of the year, during the "Celebration of Science" operation, a partnership was set up with the "Les Frères Poulain" science influencers and popularisers, who have a discovery channel on YouTube, to familiarise young audiences with low-carbon electricity and its role in the energy transition. The programmes have been viewed over 480,000 times.

(1) Epoka awards, 29 January 2021: player.vimeo.com/video/502701862?title=0&byline=0&portrait=0.

(2) www.edf.fr/sites/default/files/contrib/groupe-edf/MVP/Communication%20responsable/code-de-communication-responsable-edf.pdf

3.6 Vigilance plan

In accordance with French law no. 2017-399 of 27 March 2017 relating to the duty of care of parent companies and ordering companies, the EDF group published its fourth vigilance plan in this Universal Registration Document. This vigilance plan demonstrates that the identification, prevention and mitigation of risks related to serious violations of human rights, the environment and the health and safety of persons are systematically taken into account in all EDF group activities, including in its relations with suppliers and subcontractors and with a continuous progress approach. EDF's vigilance plan was determined within the framework of the UN Guiding Principles on Business and Human Rights, OECD Guiding Principles, the fundamental conventions of the International Labour Organization and UN International Bill of Human Rights.

EDF has a long track record of running a responsible business, based on the values of respect, solidarity and responsibility, promoting sustainable solutions for individuals and the environment.

EDF's *raison d'être* has been modified to read "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development" and this statement was added to its articles of association at the General Shareholders' Meeting held on 7 May 2020.

This *raison d'être* helps us to improve the visibility and consistency of the EDF group's CSR structure. It is split into 4 key issues and 16 major CSR commitments covering all of the Group's CSR commitments and policies.

3.6.1 Main characteristics of EDF as regards the "Duty of Care" law

The EDF group is an integrated energy company engaged in activities involving risks in three fields where the duty of care applies. EDF is active in all areas of the electricity industry and some areas of the gas industry: power generation using nuclear, renewable and thermal energies; electricity transmission and distribution; sales; energy services; energy trading (see section 1.4 "Description of the Group's activities").

As a key player on the French market – both in mainland France and overseas regions and territories – EDF holds strong market positions in Europe, particularly in the United Kingdom, Italy and Belgium. EDF is the no. 1 nuclear-based electricity operator worldwide and the Group is also active in the design and production of nuclear equipment and fuels. As the top producer of renewable energies in Europe, EDF operates 80% of the hydroelectric power capacity in mainland France and is developing its skills in other renewable energy sources, including more particularly, land-based and off-shore wind power, photovoltaics and biomass sources. The Group is also an important player on the gas market generating electricity and heat using combined-cycle power plants and sells natural gas in several countries.

EDF's activities are based mainly in OECD countries. EDF's assets and projects that are managed in many countries worldwide. Countries considered to be "higher-risk countries" receive special care, including in terms of relations with partners. As regards the supply chain, over 95% of Tier-1 suppliers managed by the Group Procurement Division are located in France or the European Union. Suppliers of certain subsidiaries or suppliers involved in international projects are subject to special vigilance measures.

Pursuant to law of 27 March 2017, because the Group's activities are mainly in the industrial field, EDF exercises upstream vigilance, with regard to any risk of violation of persons' rights or risk to their health (employees, service providers, local residents, local communities and customers) or risk to the environment prior to making investment decisions, particularly to build, operate, maintain or dismantle facilities.

3.6.2 Scope and methodology for developing the plan

Scope of the vigilance plan

The scope of the vigilance plan covers EDF's activities, the activities of subsidiaries it controls [(1)], as well as the activities of its suppliers and subcontractors with which the Group has established commercial relations to the extent their activities are related to those relations.

Dalkia and Framatome subsidiaries with a headcount of over 5,000 employees are integrated in the plan, together with all French and foreign subsidiaries. RTE and Enedis, respectively the French power transmission and distribution system operators, are independently managed subsidiaries, and therefore publish their own vigilance plans.

Methodology for developing the plan

The preparation of the plan involves all parties in the EDF group:

- the Group Duty of Care Compliance Officer;
- the EDF Corporate Divisions: Sustainable Development Division, Legal Division, Risks Division, Ethics and Compliance Division, Procurement Division, HR Division and International Division;
- all other EDF Business Divisions and Group subsidiaries heading up projects in France or abroad;
- the trade union organisations within the framework of the global framework agreement on the Group's social responsibility (Global CSR Agreement).

The plan is based on the Group reference documents:

- mandatory Group policies binding on all controlled entities: risk management and internal control, governance of subsidiaries and holdings, project management, ethics and compliance, sustainable development, health and safety, procurement;
- internal documents made public: Ethics Charter, code of conduct Ethics and Compliance, Sustainable Development Charter for Suppliers, Global Framework Agreement on Corporate Social Responsibility (CSR);
- external sources: UN Global Compact, UN Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises, WBCSD CEO Guide to Human Rights, Conventions of the International Labour Organization (ILO) guaranteeing fundamental principles and rights at work and combatting for the elimination of discrimination, Declaration on the Rights of the Child, Declaration on the Elimination of All Forms of Discrimination against Women, Global Reporting Initiative (GRI), Supplier Relations and Responsible Procurement Label (RF&AR);
- the EDF group's reference framework drawn up in March 2021: "Human rights and fundamental freedoms, Health and safety, Environment, Business ethics: the EDF group's commitments and requirements".

In 2020, EDF strengthened the governance of its vigilance plan. A special Group Duty of Care Compliance Officer is in charge of supervising and implementing the plan, using feedback from entities and working in cooperation with a Duty of Care Committee involving the other relevant divisions (legal, risks, ethics and compliance, human resources, purchasing and international).

The duty of care is implemented consistently throughout the year.

(1) Subsidiaries integrated into the scope of consolidation using the full consolidation method pursuant to Article L. 233-16 II of the French Commercial Code (in France and abroad) (see note 3 to the consolidated financial statements).

3.6.3 Stakeholder association

The Global Framework Agreement on Corporate Social Responsibility signed by EDF in 2018 with the Group's trade unions and two international trade union federations (IndustriAll and ISP) states that EDF's vigilance plan will be "developed and set up in association with the Company stakeholders, including workers' representative organisations."

Since 2018, duty of care was on the agenda of all meetings organised with the signatories of the Agreement who sit on the Committee for Dialogue on Social Responsibility (CDRS) in order to discuss the progress of the vigilance plan. The Committee met in April and October in 2020. In October 2020, the Group's mapping methodology was presented in detail and approved. In 2021, training in partnership with the ILO will be organised for the members of the Committee for Dialogue.

Externally, EDF participated in discussions with other companies, lawyers, NGOs, and trade union federations within the framework of the "Entreprises pour les droits de l'homme" (Businesses for Human Rights) (EDH [1]) non-profit organisation, in order to openly exchange on the expectations of all stakeholders, compare corporate practices and improve vigilance plan preparation processes.

EDF participated in the study commissioned by the ILO, which was presented in December 2019 on the implementation of vigilance plans.

3.6.4 Salient risk mapping

Risk mapping approach for the duty of care

For EDF, the risks covered under the vigilance plan meet the criteria for "salient risks" in accordance with the UN Guiding Principles on Business and Human Rights.

The process for identifying and prioritising risks used to develop the vigilance plan is based on two complementary approaches: general risk mapping, which includes several risks related to the duty of care, and additional risk mapping, specifically focused on the duty of care.

Under the general approach described in section 2.1 "Risk management and control of activities", each Group entity conducts a risk mapping exercise, under the responsibility of management, using a risk typology designed to cover all categories of risk, whether internal or external, operational or strategic, to which the Group is exposed. The identified risks are grouped by level of qualitative importance based on their impact, risk probability and level of control. The impact is assessed using multiple criteria, including non-financial criteria such as "health impact assessment" (health and safety, internally, including providers, or externally) and "assessment of the impact on the physical or human environment".

The main purpose of the general risk mapping exercise is to define and implement action plans (prevention, protection, etc.) to reduce the impact of the risks and/or risk probability.

Through this approach, the main risks presented in section 2.2 "Risks to which the Group is exposed" have been identified, at the level of the EDF group. Several of these risks are of strategic importance for the vigilance plan:

- ethics and compliance risk (see section 2.2 – 1E "Ethics or compliance violations"): since 2019, this risk has included a "duty of care" component, implementing a Group-wide action programme and requiring Group entities to report back on their own action in this area;
- adaptation to climate change – physical risks and transition risks (3B): this risk specifically includes a component focused on the impact of the Group's operations on the climate (see section 3.1.3.2.3 "Scenario-based approach to verify corporate resilience");
- industrial safety risk and impact on environmental assets and biodiversity (4G), with a special focus on nuclear safety (5C) and hydropower safety (4B);
- management of large industrial projects (4A): this risk includes a component relating to the potential impact of projects on human rights, the environment and health and safety;
- operational continuity of supply chains and contractual relationships (4E): this risk specifically includes vigilance-based measures during the contractualisation and contract monitoring stages.

This general risk mapping exercise is supplemented by a specific assessment of the duty of care, using a two-tier methodology:

- the first level of assessment addresses the operations and projects "in the field" in all the Group's entities and subsidiaries, which implement risk assessments structured by the commitments made by the Group, summarised in the EDF's group reference framework: "Human rights and fundamental freedoms, health and safety, environment and business ethics: the EDF group's commitments and requirements";
- the second level of assessment is an interim summary: each entity, on the basis of the "field" risk assessments, identifies and assesses its exposure to potential violations of human rights and fundamental freedoms, health and safety and the environment, depending on the nature of its various operations and projects, the countries in which it operates and its suppliers, subcontractors, partners and customers. This second level of assessment is structured through systematic responses to the annual internal control questionnaire, to allow a consolidation at the Group level.

An example of this specific assessment approach for the duty of care is the risk assessment conducted by the Group Purchasing Department for the chain of suppliers. It covers all of EDF's purchasing categories and approximately 12,100 suppliers and subcontractors. The main risks concern:

- health and safety at work, particularly lifting/handling/maintenance services;
- the environment, mainly by the production of waste during operating and dismantling phases of facilities; as well as the use of rare materials, in particular with suppliers of IT and telecommunications equipment;
- human rights, particularly in the textile industry which supplies Personal Protective Equipment for employees.

Using this assessment, priorities can be set for supplier evaluations, controls and audits (see section 3.4.2.3.2 "Responsible procurement strategy and practices").

These two approaches (general and specific) identify the "salient" risks, which determine the action to be taken under the vigilance plan. The salient risks are shared with the trade union organisations as part of the Committee for Dialogue on Social Responsibility (CDRS).

The salient risks are as follows:

Human rights and fundamental freedoms

In the area of human rights and fundamental freedoms, the Group's Ethics and Compliance policy which includes duty of care has led the EDF group to establish a reasonable diligence plan for all of its entities, which is implemented on the ground by identifying salient risks and the related measures to mitigate such risks. These risks are first assessed based on the country where the entity, its subsidiaries and its suppliers do business. For EDF's activities and projects in Latin America, Asia, Africa and the Middle East, due to local practices and situations and legislation which are less demanding than the standards applicable in OECD countries, the Group identifies:

- risks of harm to communities, indigenous peoples and vulnerable groups (in particular when engaging in dialogue and concertation processes and when there are land issues or displacement of populations);
- risks due to working conditions, including forced labour and child labour;
- risks due to the practices of security services or companies.

(1) e-dh.org

Environment

Group mapping of risks is performed based on the Group's line of industrial activities. Environmental risks are identified, assessed and prioritised through the Group's environmental management system (EMS) (see section 3.5.2.5.5 "Management of environmental risks") and mainly concern:

- impact on the climate;
- impact on water, soil, air and biodiversity;
- waste management and the impact on natural resources.

Health and safety

Health and safety risks are mapped by the Health and Safety Division. For Group employees, service providers, suppliers and subcontractors, the risks given priority are:

- occupational accidents;
- occupational illnesses (asbestos, ionising radiation);
- musculoskeletal diseases and anxiety-depressive disorders.

Salient risks are related to the operation of industrial facilities (see section 2.2.4 – Risk 4C – "Occupational health or safety violations (employees and service providers)").

3.6.5 Risk prevention and mitigation initiatives

Under its *raison d'être*, EDF has defined four major issues split into sixteen CSR commitments that integrate the duty of care.

Risk prevention and mitigation measures are implemented by each relevant entity by way of applying corporate and sectorial policies and using common Group methodology for risk control as a basis. This methodology provides a description of risk treatment action plans and an evaluation of their efficacy. Industrial projects are subject to a risk analysis within the scope of application of the duty of care, taking into account their nature, size, technical features and location. For this purpose, environmental and social impact assessments are based on the most demanding international standards (mostly IFC, WB, ADB [1]).

In addition, issues relating to the environment, personal health and safety and human rights are systematically addressed as part of the assessment process for projects submitted to the Group Executive Committee's Commitments Committee (CECEG) and to the committee that validates the Group's international development projects, the International Business Development Committee (CBDI), in the form of an identification of the risks associated with projects, to ensure that EDF's commitments in this area are not overlooked.

Human rights and fundamental freedoms

The implementation of human rights commitments is part of the deployment of the Group's "Human Rights and Fundamental Freedoms, Health and Safety, Environment, Business Ethics: EDF group's commitments and requirements" reference framework. It is based on principles of action that apply to all of the Group's activities, and which aim, as part of an approach to progress, to carry out in particular:

- screening, initial and ongoing, and management of environmental and societal impacts and risks, including those caused by operations under its business relationships;
- organisation, throughout the world, of transparent, debated discussions and consultations for each new project (see section 2.2 – 4A "Management of large and complex industrial projects (including EPR projects)"), with a specific focus on the rights of local and indigenous communities and vulnerable groups.

The implementation and monitoring of these commitments and requirements is ensured under the Group's existing internal policies or agreements, in particular the sustainable development policy, the ethics and compliance policy, the purchasing policy, the health and safety policy, the global CSR agreement, the Ethics Charter and the roll-out of the vigilance plan.

Systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff), have also been set up.

EDF strives to implement its commitments in the early stages of its investment processes, including in its business relationships by requiring its suppliers and subcontractors to comply with CSR requirements for operations related to their joint business relationships (see section 2.2.4 – 4E "Operational continuity of supply chains and contractual relations" and sections 3.3.1 "Health and safety of all individuals" and 3.3.2.3 "Human rights").

Environment

To prevent and mitigate risks of serious harm to the environment, EDF relies on its Environmental Management System, its Sustainable Development policy as well as Ethics Charter to commit its entities to a precautionary approach, to acting responsibly and to developing technologies which respect the environment. Management of identified risks, including those associated with climate change, is fully integrated into the Group's global risk management process and internal control system. The most significant risks are covered in risk control plans in conjunction with the Group's Sustainable Development policy (see section 3.1.2 "Climate change adaptation strategies").

The EMS organises Group-level management of environmental performance and is aimed, in particular, at controlling risks related to greenhouse gases, impacts on water, air, soil and the production of conventional and radioactive waste. Special attention is focused on preserving biodiversity and services rendered by ecosystems. This system is ISO 14001 2015 certified by the Afnor certification external expert, for a scope representing almost all the consolidated revenue of EDF and its controlled subsidiaries (excluding Enedis) (see section 3.5.2.5.2 "Environmental Management System"). 100% of industrial sites are covered by an EMS and, for all thermal, nuclear and hydropower generation sites in Europe, this system is certified.

Climate

Building on its current energy mix, that is already a very low carbon mix (which is detailed in section 3.1.1.4 "EDF, Europe's biggest investor in carbon-free energy"), the Group has decided to implement, through appropriate governance (which is detailed in section 3.1.3 "EDF climate governance"), a climate strategy meeting the aims of the CAP 2030, based on 4 CSR commitments: an ambitious carbon trajectory, carbon offsetting solutions, adaptation to climate change [2] and the development of electricity usage and energy solutions (see section 3.1 "Carbon neutrality and the climate").

More specifically, for its aim of becoming carbon neutral by 2050, its carbon trajectory targets are split into medium-term (2030) and short-term (2023) targets. They are coupled with a renewable energy development target, a coal phase-out commitment and a high level of involvement in the TCFD climate governance scheme advocated at the international level.

Carbon neutrality by 2050

The EDF group was one of the first groups to officially commit, as early as 2018, to contribute to the efforts to become carbon neutral by 2050. This commitment was strengthened and clarified in March 2020. In practice, it involves reducing the Group's direct greenhouse gas emissions to zero or virtually zero by 2050, reducing indirect emissions as much as possible within the framework of national policies and implementing negative-emission projects to offset the Group's residual emissions by 2050. This covers emissions of all greenhouse gases for all scopes and for all operations of the Group across the globe.

In February 2020, the EDF group signed up for the "Business Ambition for 1.5 degrees: our only future" initiative launched by the United Nations Global Compact, We Mean Business and Science Based Target Initiative. This coalition has now been joined by more than 300 companies committed to achieving carbon neutrality by 2050, in order to limit the rise in global temperatures to 1.5°C over pre-industrial temperatures.

(1) IFC: International Finance Corporation. WB: World Bank. ADB: Asian Development Bank.

(2) In accordance with the IPCC (IPCC special report Global Warming 1.5°C, October 2018), trajectories with no or minimal overshoot of the 1.5°C target can only be achieved through increased electrification of uses combined with accelerated decarbonisation of electricity.

Through this commitment, the EDF group is also part of the "Race To Zero" initiative run by the United Nations and has joined the "Climate Ambition Alliance" [1] alongside more than 120 countries, 450 cities, 45 investors and 1,000 companies.

Carbon trajectory: 2030 targets recognised by the SBTi

In 2020, the EDF group set new targets to cut its greenhouse gas emissions by 2030, covering both its direct emissions (Scope 1) and its indirect emissions (Scopes 2 and 3).

On 7 December 2020, these targets were validated as part of a "Well Below 2°C" trajectory by the Science Based Targets initiative [2]. The EDF group has therefore committed to the following 2030 targets:

- 50% reduction on 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (i.e. not generated by it) to be sold to end customers;
- 28% reduction on 2019 levels for emissions associated with the combustion of gas sold to end customers (Scope 3).

In keeping with these targets validated by SBTi, the EDF group has decided to set the following additional 2030 targets: 25MtCO_2 for Scope 1 emissions in 2030, 35gCO_2/kWh for the carbon intensity of the electricity and heat generated by the Group in 2030, a 28% reduction on 2019 levels of the emissions of the entire Scope 3 by 2030.

In order to reach these targets, a greenhouse gas emissions reduction trajectory has been developed for the three Scopes of the EDF group. This trajectory contains a 2023 milestone, with the following interim targets:

- 28 to 30MtCO_2e for the Group's Scope 1 emissions by 2023 (this range factors in the uncertain post-health crisis scenarios);
- 23% reduction on 2017 levels for Scope 1 and Scope 2 emissions, also including emissions from non-consolidated assets and emissions associated with electricity purchased (*i.e.* not generated by it) to be sold to end customers;
- 10% reduction on 2019 levels for emissions associated with the combustion of gas sold to end customers and an 8% reduction for the entire Scope 3 of the Group.

These 2023 and 2030 targets for the Group's direct and indirect emissions are implemented through emission trajectories for all the Group's business lines and entities.

Doubling installed renewable energy capacity between 2014 and 2030

As part of its CAP 2030 strategy, it has committed to a target of more than doubling its net installed capacity in renewables (including hydropower) between 2015 and 2030, to reach 60GWe in 2030.

Moving away from coal-fired power generation by 2030 in all geographical areas.

Since 2017, EDF group has been engaged in the Powering Past Coal Alliance (PPCA), which promotes the phasing out of coal in EU countries by 2030 and in the rest of the world by 2050 in the wake of the Paris Agreement. In 2019, the EDF group has set itself as a goal to stop coal power generation by 2030 in all geographical areas.

Further details on climate risks and their potential impact are summarised in section 3.9.4 "Summary of EDF group climate risks".

Biodiversity

The challenges of carbon neutrality go hand in hand with the protection of biodiversity, one of EDF's long-standing commitments. In 2020, the Group renewed its commitment to biodiversity through two voluntary schemes supported by the French government: "Entreprises engagées pour la biodiversité – act4nature France", a corporate biodiversity scheme run by the Office français de la biodiversité (French Biodiversity Office) and "Act4nature International" run by Entreprises pour l'environnement (Epe). The action taken by the Group is structured around the following priorities: reducing the contribution of its operations to major biodiversity pressures, recreating spaces and conditions promoting biodiversity, improving and sharing knowledge, strengthening governance and raising awareness of biodiversity-related issues (see section 3.2.1 "Biodiversity").

Waste and circular economy

An optimal use of the natural resources consumed through its value chain is a key part of the Group's corporate responsibility policy. The Group therefore promotes a circular economy approach (based on a region or a sector) focusing on three priorities: eco-socio-design, functionality economy and industrial ecology. The Group prevents and optimises the production of conventional waste by promoting reuse, recycling and recovery initiatives for products/equipment throughout its value chain: a customised "waste plan" is produced for all new construction sites to avoid the production of conventional waste and promote recycling and recovery. The Group makes every effort to eliminate or replace any substances that may be harmful to the environment or individuals with more environmentally-friendly products and is implementing a programme to eliminate or replace certain substances (PCBs, chemicals) with more environmentally-friendly products by 2021, in accordance with local regulations.

Chemical risk

When it is technically feasible, in order to reduce the pollution risks, the Group's entities have also implemented a programme to eliminate or substitute certain chemical substances with more environmentally-friendly products. This work focuses as a priority on CMR (carcinogenic, mutagenic, or toxic for reproduction) substances or those considered extremely worrying (see section 3.5.2.5.5 "Management of environmental risks").

Radiological risk

Nuclear safety is the Group's top priority and a major, ongoing concern for the Group throughout the entire cycle, from fuel supply to decommissioning and waste management. It is based on technical and organisational specifications aimed at preventing a nuclear accident, and in the hypothetical case of such an accident, at limiting the consequences thereof (see section 2.2.5 "Specific risks related to nuclear activities"). The Group takes full responsibility for radioactive waste and, in France, uses procedures to decommission closed nuclear power plants that are completely safe and protect the environment. It optimises and manages the radioactive operating and decommissioning waste for which it is responsible and develops treatment processes to reduce the volume of stored waste (see section 3.2.4.4 "Taking responsibility for radioactive waste").

Hydropower safety

Hydropower safety comprises all the measures taken when designing and operating dams and plants to reduce risks and hazards to people and property associated with water and the presence or operation of facilities (see section 2.2.4 – 4B – Hydraulic safety risks). Responsible use and sharing of water are governed by EDF's sustainable development policy (see section 3.2.3 "Sustainable and integrated water management").

Health & Safety

To prevent and mitigate risks of serious harm to the health and safety of its employees, suppliers and subcontractors working on its sites (see section 2.2 – 4C – "Occupational health or safety violations (employees and service providers)"), the Group relies on a Health and Safety policy further strengthened by the endorsement signed on 23 April 2018 by the Chief Executive Officer and all of the Executive Committee members. This policy is supported by a roadmap and defines the framework for consistent policy and action plans in the various subsidiaries (see section 3.3.1.3.1 "Health & Safety Policy").

The Health and Safety policy sets down as an absolute priority the elimination of fatal accidents (see 3.3.1.3.2 "Eradicating fatal accidents"), followed by the reduction in the number of accidents, as well as absenteeism. The risks identified are used for information campaigns. The Group entities are rolling out the 10 "Essential Rules" specifically defined by EDF to prevent the occurrence of serious, and particularly, fatal, accidents. High Potential Events (HPE) are shared and analysed to foster experience-based feedback. Group entities conduct self-assessments using a shared reference framework called "BEST: Building Excellence in Safety Together", compiling best practice for health and safety improvements.

(1) Alliance created in September 2019 during the Climate Action Summit of the United Nations General Secretariat by the President of Chile Sebastián Piñera.

(2) Initiative launched following the Paris Agreement in 2015 by the following four organisations: CDP, UN Global Compact, World Resources Institute and World Wild Fund.

EDF promotes the concept of general health and relays public health campaigns. In November 2020, EDF agreed to partner the "Moi(s) Sans Tabac" anti-smoking campaign run by Santé publique France (French Public Health Agency). Regarding the health and safety of its customers and the public, the Group's entities implement customised information campaigns on electricity usage (see section 3.3.1.4 "Health and safety of consumers"), including in the areas surrounding EDF sites. Likewise, in its international infrastructure projects, EDF encourages the use of public health impact studies for all stages of its facilities and customised management programmes.

Purchases

The Group's Purchasing policy states that respect for contractual commitments and the requirements of sustainable development policy in favour of people and the environment "constitute the foundation of the relationship with suppliers".

A "responsible purchasing" policy led by the Group Procurement Division makes it possible to identify supplier-related risks (see section 3.4.2.3.2 "Responsible procurement strategy and practices"). This policy includes, among other initiatives, the use of CSR requirements in contractual clauses. Serious discrepancies identified amongst our suppliers may compromise the contractual relationship and entail termination of the contract.

Suppliers' respect for environmental and societal undertakings is mainly ensured by giving priority to supplier evaluations which are defined based on the risk mapping performed by the Procurement Division. In segments falling within the major risks category, the high-priority evaluations are carried out either through self-assessment CSR questionnaires completed by suppliers and subcontractors and verified by an independent external provider, based on ISO 26000 compliance, or through audits [(1)] performed by external specialist firms.

In the coal supply chain, EDF no longer has direct contractual relations with mining companies or the market, but remains an active supporter of *Bettercoal* [(2)] – the initiative for responsible coal purchases of which EDF is a founding member. Concerning uranium supply chain, clauses authorising the completion of audits and setting out EDF's requirements in terms of enforcement of the fundamental rights and main international standards by suppliers and subcontractors have been included in the contracts. The uranium mine audit system used by EDF since 2011 ensures that the ore is extracted and processed in good environmental, social and societal conditions (see section 3.4.2.3.3 "Coal and uranium supply chain").

3.6.6 Whistleblowing system

In 2018, the EDF Executive Committee decided to upgrade its system to secure the handling of reported wrongdoing and increase personal data confidentiality and security.

Scope

The Executive Committee decided to set up a single whistleblowing system for all wrongdoing reported under the Sapin II Law and the law on "duty of care" as well as wrongdoing reported by employees alleging harassment and discrimination. The Group Ethics and Compliance Department is the Group point of contact for the system. This Group system benefits all Group entities, except for the subsidiaries in the regulated sector, Enedis and RTE [(3)], which have their own whistleblowing system to respect their managerial independence. Whistleblowers may choose to use the Group whistleblowing system or the other channels available to them (manager, human resources, staff representatives, local ethics and compliance officers, mediators, etc.).

Accessibility of the system

The Group whistleblowing system, managed from an independent platform that is not connected to EDF's IS, may be accessed at any time via the EDF group website. The interface is available in several languages (French, English, Italian, Portuguese, Dutch and Mandarin) in France and abroad, and the whistleblower can report wrongdoing in the language of their choosing [(4)].

Reporting wrongdoing

The EDF group ethics and compliance whistleblowing system allows Group employees and external staff (temporary workers, service provider employees, etc.) or occasional employees (fixed-term contracts, apprentices, trainees, etc.), as well as third parties, to report wrongdoing of which the EDF group or its staff are the culprits or victims.

Analysis of the admissibility of reports

Once the report has been submitted, whistleblowers receive confirmation within 72 hours informing them that the admissibility assessment has begun. Whistleblowers can submit reports anonymously in countries where this is authorised. Wrongdoing can be reported anonymously, as long as the severity of the reported facts is established and the factual elements are provided in precise and sufficient detail, so as to provide evidence for the reality of the reported facts.

The Group Ethics and Compliance Department assesses the admissibility of the report, which depends on the scope of application and the whistleblower's relationship with the Company. This admissibility is independent of whether the alleged facts are well-founded or not, which can only be determined through a report handling process. Once a ruling has been made on admissibility, the whistleblower is informed of the protective measures from which they benefit (protection under the Sapin II Law, French Labour Code, etc.). These vary according to their status (victim or witness, individual or corporation, etc.), their relationship with the Company (employee, external service provider, third party, etc.) and the themes involved (fraud, harassment, serious environmental damage, etc.).

Processing of admissible reports

Each report that is deemed admissible is processed. The Group Ethics and Compliance Department appoints a case manager and, if necessary, is assisted by Ethics and Compliance Officers and other experts to handle reports. When the investigations have been completed, an investigation report is drawn up by the case manager. If the allegations reported are proven or partially proven, an action plan is implemented. The Group Ethics and Compliance Department monitors the progress of this action plan and ensures it has been fully implemented before the report is closed.

3.6.7 System for monitoring the measures implemented and evaluating their effectiveness

In order to monitor the measures implemented and evaluate their effectiveness, EDF relies on indicators established for the purposes of its non-financial reporting processes that cover the areas involved in the duty of care (see 3.7.2.2 "Further details on performance indicators"), as well as the monitoring system for Group risks.

A Group Duty of Care Compliance Officer was appointed on 2 November 2020 and is responsible for producing and monitoring the vigilance plan in liaison with the Sustainable Development Department, the Legal Department, the Group Ethics and Compliance Department and all other departments and subsidiaries affected. Support is provided by a network of "Duty of Care" Officers coordinated jointly with the Sustainable Development Department.

Each year, a review of the vigilance plan is presented to the Committee for Dialogue on Social Responsibility (CDRS) and regular briefings on its implementation and any developments are presented to the Corporate Responsibility Committee of the Board of Directors (see section 4.2.3.4 "Corporate Responsibility Committee").

(1) Auditing standards are based in particular on ISO 26000, OHSAS and SA80000.
(2) bettercoal.org/
(3) Distribution network operator Enedis and transmission operator RTE are managed independently.
(4) www.edf.fr/edf/alerte-ethique

3.6.8 Procedure for regular evaluation of the situation of subsidiaries, subcontractors and suppliers based on risk mapping

Under the internal control guide, which in turn refers to the "duty of care" section of the Group's "Ethics and Compliance" policy, entities and subsidiaries are required to complete a form on the management of their operations for all aspects of the duty of care. The purpose of this form is on the one hand to summarise the specific risk assessment carried out for each entity (evaluation and assessment based on analysis of results, facts, causes and consequences) and on the other hand to self-assess the management of its operations and performance of the entity, and set out the objectives of its yearly action plan. They are asked to focus particularly on the evaluation of suppliers.

In addition, within the framework of the Responsible Purchasing plan, the Group Procurement Division, the main Divisions and the subsidiaries carry out CSR evaluations on their suppliers and subcontractors using both questionnaires and audits administered directly or by independent firms (see section 4.2.3.4 "Corporate Responsibility Committee").

3.6.9 Report on the EDF group's vigilance plan

In 2020, the EDF group continued to implement the requirements of the duty of care in all of its activities and relations with suppliers and subcontractors.

Main actions at the Group level

For new investment projects in mainland France, French overseas regions and territories and abroad, the identification of risks, discussed within the various Group investment committees [(1)], and particularly within the investment committees of the Group Executive Committee (CECEG) and the International Business Development Committee (CBDI) relies on the use of a screening grid that take into account risks related to the duty of care.

Projects financed by Green Bonds or development banks were the subject of reporting to financiers on social and environmental matters (see section 3.1.3.3.2 "Use of Green Bonds"). In 2020, EDF extended the scope of its Green Bonds to cover biodiversity, by including biodiversity indicators in the *Green Bond Framework* [(2)].

More details on the actions implemented are given below:

Human rights

In March 2021, EDF drew up a set of guidelines listing the commitments of the Group and the fundamental requirements for its business relationships in terms of human rights and fundamental freedoms, environmental protection, protection of personal health and safety and business ethics. In the guidelines, the Group notes and summarises its commitments in terms of compliance with international standards, the rights of its staff, the rights of local communities and the use of security forces (see section 3.3.2.3 "Human rights").

Human rights commitments are implemented as part of the Group's CSR commitments [(3)] and requirements, based on the principles of action that apply to all Group operations, such as:

- screening, initial and ongoing, and management of environmental and societal impacts and risks, including those caused by operations under its business relationships;
- organisation, throughout the world, of transparent, debated discussions and consultations for each new project;
- the implementation and monitoring of these commitments and requirements is ensured under the Group's existing internal policies or agreements, in particular the sustainable development policy, the ethics and compliance policy, the purchasing policy, the health and safety policy, the global CSR agreement, the Ethics Charter and the roll-out of the vigilance plan;
- systems for collecting and processing reports of wrongdoing, that are accessible and notified to anyone who could be impacted by the Company's operations, guaranteeing the confidentiality of the reports and protecting internal whistleblowers (employees and external staff), have also been set up.

When leading international projects, the commitment of stakeholders and seeking of consent have been systematic. When applicable, the use of migrant workers at work sites and on-site security guard forces received particular attention. For example, all hydropower projects included a stakeholders' commitment plan and a local complaint management mechanism. These plans make it possible for all persons concerned to freely express their complaints or worries and to participate in decision making.

In the field of training, the e-learning programme "Human rights in business" developed with the Businesses for Human Rights organisation (Entreprises pour les droits de l'homme – EDH) was updated with a yearly process which includes the duty of care and is available to all employees. The updated version of this training module was released to employees as part of an internal communications campaign to raise awareness of Human Rights for the Human Rights Day held on 10 December 2020.

In 2018, an NGO referred the planned Gunaa Sicaru wind farm, managed by a subsidiary of EDF Renewables in Mexico, to the OECD's French national contact point (NCP). During the course of the OECD mediation process, the EDF group took part in two dialogue meetings with the plaintiffs and provided some responses to the concerns raised. The NCP closed the matter in spring 2020. The local consultation process had resumed in early 2020 but has since been suspended due to the health crisis. Likewise, in December 2019, EDF responded to a formal notice for the same project sent pursuant to the French "Duty of Care" Law by that NGO and four individuals. EDF was then summoned on 13 October 2020 to appear before the Paris Court of Justice (Tribunal judiciaire) under the French "Duty of Care" Law. The applicants have asked the court to order changes to the vigilance plan produced by EDF to better address, in particular, the risks posed to the rights of indigenous communities and to order compensation for the damage caused by its failure to fulfil its duty of care. EDF has challenged these two applications. The investigation is underway.

Environment

Environmental risks were identified and incorporated into the Group's environmental management system (EMS) and internal control system (see section 3.5.2.5.2 "Environment management system (EMS)").

Today, the EDF group provides one of the most detailed GHG reports for its entire value chain of any leading European electricity company. EDF improves its performance in this area each year and it now includes, since 2020, all its results in the non-financial performance statement for the year under review (see section 3.1.1.2 "The Group's GHG report"). In 2020, and for the fourth year, the Group was on the A List published by CDP Climate Change, uniting companies with outstanding performance in the areas of transparency and objectives laid down for their carbon approach and their commitment to fighting climate change (see section 3.8 "Non-financial rating").

The EDF group only had three coal-fired plants left at the end of 2020: the Le Havre plant, scheduled to be shut down in spring 2021, the West Burton A plant, scheduled to be shut down by 2024 and, lastly, the Cordemais plant, scheduled to be shut down by 2026 at the latest, which may be converted to a biomass plant as early as 2022 (see, also, section 1.4.1.2.2 "Issues relating to thermal generation").

(1) This concerns new projects involving investments of more than €50 million, entailing a significant impact on regions and the environment.

(2) The Green Bond Framework is a document produced by EDF for the investment community, non-financial rating agencies and external auditors. It sets out the five main components of a Green Bond issue, as adapted to address the specific characteristics of EDF: use of the funds, the project selection process, fund management, reporting and external review.

(3) EDF SA and the companies it controls. Control is established, in particular, if EDF holds, directly or indirectly, a majority of the share capital or the voting rights within the governing bodies of the relevant companies. Excluding RTE and Enedis which are independently managed subsidiaries within the meaning of the provisions of the Energy Code.

Additionally, in 2020, the EDF group produced a set of internal "responsible gas provider" criteria, to bring its gas operations into line with its climate commitments:

- cross-disciplinary criteria: all the EDF group's gas operations are included in the carbon trajectory (covering direct and indirect emissions) set for each Group entity in line with the Group's 2030 targets. All development projects must demonstrate a contribution to the energy transition of the relevant regions and their business plan must ensure compliance with the Group's 2050 carbon neural target;
- additional criteria for electricity generation: no new gas projects may be developed (Combined Cycle Gas Turbine – CCGT), unless the project contributes to reducing the carbon intensity of the electricity system of the relevant country or helps secure the country's supply. Whenever technically and economically feasible, the project must use solutions designed to reduce its direct emissions, such as green gas, hydrogen or carbon capture and storage;
- additional criteria for gas sales: the EDF group helps its gas customers to shift to energy savings, energy efficiency and a reduction in their emissions through its products and services, expertise and specialised subsidiaries; it develops and encourages alternative solutions to fossil fuels whenever available (electricity, heat pumps, renewable gas, renewable heat, etc.).

In 2020, the Group renewed its commitment through two voluntary schemes supported by the French government: "Entreprises engagées pour la biodiversité – act4nature France", a corporate biodiversity scheme run by the Office français de la biodiversité (French Biodiversity Office) and "Act4nature International" run by Entreprises pour l'environnement (Epe).

The EDF group has set a new short-term key performance indicator for biodiversity, measuring the achievement by 2022 of the Group's commitments under the Act4Nature International scheme. The methodology associated with this indicator is explained in section 3.7.2.2 "Further details on performance indicators".

Additionally, in 2020, in St Alban, EDF joined forces with the Isère Conservatoire des espaces natures (Natural Site Conservation Body or CEN) to restore and manage the Malessard wetland (20 hectares). The 2020-2024 management plan produced by the CEN includes measures to increase inventories of wildlife (beavers, amphibians, dragonflies, etc.) and take the first steps in 2020, such as creating ponds to support amphibians and managing invasive alien species, and arrange an eco-grazing policy in the long term.

The Bugey plant and the Conservatoire des espaces naturels have also joined forces to protect an exceptional natural area. The main aim of the partnership is to protect steppe grasslands and endemic species, through the use of natural grazing for example. They also plan to arrange visits to this protected natural area to enhance the value of local biodiversity. The plant maintains, in liaison with the site's green spaces manager, an area dedicated to eco-grazing by sheep and donkeys, located on the banks of the Rhône. This initiative is designed to reintroduce natural methods of maintaining green spaces to replace the use of mechanical, polluting tools and helps preserve the endangered Solognot sheep. The new herd introduced now maintains the plant life at the foot of the cooling towers. Apiaries, maintained by volunteer employees, and blue tit nests, used to tackle processionary caterpillars, have also been installed at the plant.

In terms of the circular economy and waste, entities and companies have implemented action plans to minimise the generation of waste, integrated in the management systems' action programmes. The mission of the Circular Economy and Waste Group reporting to EDF's EMS is to avoid the generation of waste by implementing prevention, optimisation and recycling initiatives. Many large-scale projects under the Grand Carénage programme recover a large amount of equipment and spare parts that can still be used. For this reason, EDF tested "EDF Reutiliz" in 2020, a digital platform to help equipment to be reused, with a view to reducing the consumption of resources and limiting the production of new goods. It will be rolled out in 2021, building on the reuse operations already in place for the generation fleet.

Health & Safety

Each Group entity promoted action plans aimed at on-going improvement of safety and health at work, at the request of the Executive Committee. Despite a steady improvement in the accident frequency rate, a new shutdown was organised in October 2020 for all working teams within the Group, involving employees and providers, in order to determine local initiatives to improve prevention levels in response to a stagnation in the number of fatal accidents. Group employees were encouraged to follow the e-learning courses on Shared Vigilance (18,459 EDF employees have completed this training module) and road hazards (completed by 37,224 employees).

Purchases

In 2020, the Group Procurement Division strengthened the performance of its risk analysis methods in accordance with the law on the duty of care. New methodology takes into account all of the CSR topics (environment, working relations and conditions, human rights, ethics and compliance) and makes it possible to determine the level of residual risk and define the priority controls and actions to be taken with suppliers depending on their purchasing segment (see section 3.4.2.3.2 "Responsible procurement strategy and practices").

Major residual risks have been identified in the various sectors of purchasing, mainly concerning safety, ethics, waste, the use of rare materials and human rights. 15% of the purchasing segments analysed are classified as having a major residual risk, 51% are classified as having a material residual risk and 34% are classified as having a low residual risk.

Supplier monitoring is mainly carried out by the Division or Contract Management, which uses Performance Assessment Sheets and Supplier Assessment Sheets. Almost 10,000 assessments are completed each year, on almost 2,000 suppliers. CSR assessments and audits are also carried out. On-site supplier audits are conducted by external, independent providers.

The Group Purchasing Department uses Afnor's Acesia online assessment and dialogue platform to send these questionnaires. The questionnaires completed by the supplier are systematically (and independently) checked by the Afnor teams. This tool makes it possible for purchasers and suppliers to share an approach of continuous improvement in Corporate Social Responsibility. At the end of 2020, 2,200 suppliers were questioned using the Acesia platform, and nearly 900 have been controlled. The assessments were "satisfactory" for almost 40% of the audited questionnaires. The suppliers to be assessed or audited are mainly selected based on the new supplier risk mapping and information received from buyers and business lines, on the contracts in progress. Group entities that do not use the Acesia platform use their own specific assessment methods.

Suppliers of the Nuclear Division must agree to comply with the Progress Charter for Exemplary and Efficient Nuclear Power and the Social Specifications of the Strategy Committee for the Nuclear Sector.

Edison uses a self-assessment platform that focuses on the ten principles of the Global Compact and is shared with other companies.

EDF Renewables assesses its suppliers of strategic wind and solar energy equipment in its qualification processes, comprising selection criteria in all CSR fields. A Chinese turbine supplier that qualified for the very first time was only selected for its ISO 14001-certified plants.

All Group entities conduct assessment or follow-up audits in their supply chain. For example, the Dalkia teams conducted 2,225 health and safety audits on its subcontractors in 2020. EDF Hydro audited 62 of its suppliers: one of them obtained an insufficient CSR risk control rating for a subcontractor in China. As a result, it was asked to produce an action plan and the orders placed with it were monitored closely. Luminus noted a major discrepancy with a subcontractor of one of its main suppliers: after several alerts, the entity suspended its contract until the relevant company became compliant.

The Purchasing Department conducted 40 on-site audits worldwide, 48% of which were in France. These audits cover all CSR aspects: environmental, social and ethical policies, commitments and practices. Four quality audits were also conducted. CSR audits are designed to test the CSR commitments adopted and are conducted on site (head office or production site of the supplier or place of work at an EDF site). A recent example of this is the campaign of audits conducted on tenderers and their main subcontractors for a call for tenders in the "workwear" category. Contracts may only be awarded to suppliers whose audit was deemed "Acceptable with Comment".

In general, the 2020 health crisis led to an unavoidable drop in the number of on-site audits, postponed until 2021. Apart from eight year-end audits whose reports were still pending on the date of review, 41% had a "Satisfactory" rating, 56% an "Acceptable with Comment" rating and 3% an "Insufficient" rating, requiring supplier action plans. A follow-up audit may be scheduled for the year following any audit deemed "Insufficient" or "Unsatisfactory", based on the proposed action plan and the opinion of those responsible for the contract (purchasing/business line). These campaigns have shown that suppliers still have a relatively low level of CSR risk management in their own supply chain, particularly for the SMEs audited. However, the risk of a pandemic had been properly integrated by all those audited. Additionally, the operational management of safety and environmental issues is increasingly implemented through certification processes such as the MASE or ISO 14001 certification.

Examples of actions implemented by the entities

In 2019, using its environmental and social management system, EDF Renewables organised site visits in India and China to analyse how to manage environmental and societal risks (relations with stakeholders, human rights, subcontractors' working conditions, biodiversity, waste management, etc.) in connection with the development and construction of wind and solar power projects and to train local teams on EDF group requirements in this area.

In Myanmar [(1)], a specific study was planned for the Shweli 3 project to assess and manage human rights impacts and launched in 2019. No field studies could be conducted in 2020 due to the health crisis. This study could not therefore be completed as planned but the risk assessment is already available. The main risks involve the rights of future displaced persons (including potential local communities), the safety of project workers and staff and the rights of downstream communities. Further field studies and the corresponding action plans are scheduled for 2021.

In the Ivory Coast, for a biomass project using agricultural waste (for which construction is scheduled to start in 2021), a specific study identified the work performed by children in support of their parents' work. In particular, the study (i) determined the type of work (mainly support for women collecting fallen fruit), and (ii) identified the reasons for this work (cultural, training and economic purposes). A collaboration with a cooperative already operational in the region will be set up to enhance the "field work-training" sessions on child labour and gender equality.

In Brazil, EDF Norte Fluminense (NF) organised a virtual public consultation to present and discuss the Environmental Impact Assessment (EIA) for a proposed combined cycle gas turbine plant ("UTE NF2") in accordance with the requirements of the National Environmental Council (CONAMA). The online event was held on 7 October after being publicised on the EDF NF website and through the local newspaper, radio ads, WhatsApp invitations, emails, a toll-free number and a website. It lasted more than 3 hours with a peak of 123 people connected at the same time and 224 people signed the attendance list. After the live event, lines of communication were opened up for any further questions and other events for 20 days. Additionally, a full recording of the live event was posted online and viewed 543 times.

In Cameroon, as part of the Nachtigal hydroelectric project, a programme to combat Gender-Based Violence (GBV) has been implemented. Since February 2020, victims in local communities have been assisted through a special office and GBV and HIV awareness-raising campaigns have been conducted, targeting 1,339 motorcycle-taxi and truck drivers and sex workers and 3,702 students. Training has also been provided to the employees of the civil engineering companies working on the project.

In China, actions were taken in favour of vulnerable groups by supplying and maintaining radiators for the elderly, granting scholarships to low-income students, assistance to improve quality of life and health of children (clothing, shoes, access to hot water).

In China, the Group decided not to commit to a wind turbine project in a redevelopment area. The production capacity was not consistent with the number of families that would have to be displaced.

Risks were identified by EDF Hydro at suppliers' and subcontractors' sites which have their components (water wheels and turbines, transformers, alternators) manufactured in plants located in China, India, Brazil, Turkey and Eastern European countries. CSR audits on these suppliers were requested and the majority have been performed. These audits systematically covered respect for Human rights, safety and the environment. The audits are conducted at the headquarters of the relevant companies, in certain plants and are supplemented with audits on the EDF Hydro work sites. In one case in particular, a supplier was given an insufficient score for control of CSR risks at a subcontractor's site in China, which led it to establish an action plan and enhance vigilance for orders placed with this company.

For the DTEAM (in charge of thermal facilities), the safety of service providers is an absolute priority. When activities involve risks, the level of requirements is based on certification (MASE, OHSAS 18000) of subcontractors. Improvement programmes in the fields of guard services, road transport, maintenance and logistics have been initiated in cooperation with subcontractors.

Citelum, a subsidiary with business in a number of countries, organises risk management to fulfil its duty of care based on social, regulatory and operating conditions at each one of its sites:

- in Italy, the entity was certified SA 8000 for all of its business lines and those of its subcontractors;
- in Brazil, the entity published and implemented a code of conduct which focuses particularly on the respect for human rights by suppliers;
- in Spain, the entity was certified SGE21(RSC) which guarantees that human rights-related risks have been identified, evaluated and treated.

(1) EDF is paying close attention to political developments in the wake of the coup on 1 February 2021, and may review its projects currently under development in Myanmar.

3.7 Methodology

3.7.1 Principles and changes in scopes

Principles

With regard to environmental, social and societal indicators, the reporting scope is based on the Group's financial consolidation scope and comprises EDF as well as all the fully consolidated subsidiaries (100% integration of the value of the indicators) in accordance with financial standards (IAS-IFRS) [(1)].

The contributions of entities accounted for using the equity method are excluded from non-financial reporting, with the exception of the indicator on renewable capacities in net consolidation (see section 3.7.2.2 "Details on performance indicators").

The entities acquired during the fiscal year are included in the scope of consolidation on the year following the date of acquisition for environmental and societal data, and the year of acquisition for social data if the acquisition was made more than six months from the reporting date. Data on both staff and generation capacities is presented at 31 December of the relevant year.

The reporting indicators are used on the following basis:

- the scope of consolidation established by the Financial Department;
- the aforementioned rules in terms of variation of scope;
- the criteria linked to relevance of the subsidiaries' activities in terms of environmental and societal impact:
  - for the environmental and societal data, only data from industrial activities that are significant in terms of environmental impact is reported; therefore the data for some subsidiaries included in the financial scope may not appear in the report due to their activity or their small size with respect to the environmental challenges,
  - concerning social data, the selection criterion is the entity's workforce (greater than 50).

The environmental and societal data in the Statement of non-financial performance are based on methodological sheets. This is the Group's standard for non-financial reporting in force in 2020. All of the indicators relating to consumption and emissions are the electricity and heat generation and marketing data, and to other processes related to these activities. If data is missing, particularly during the last days of the year, estimates are made on the basis of the best information available at that date.

Changes in the reporting scopes in 2020

For 2020, given the criteria presented above, the differences between the reporting scopes for the societal and environmental indicators are as follows:

- subsidiaries taken into account in the reporting of environmental indicators and not in the reporting of social indicators: EDF Belgium (Belgique), Solar Invest, Wind Invest, Renewables Portfolio, Investissement Eolien and Investimento Eolico Unipessoal;
- subsidiaries taken into account in the reporting of social indicators and not in the reporting of environmental indicators: Citelum, G2S, CHAM and Izi Solutions.

The new companies included in the scope on 1 January 2020 are Renewables Portfolio, Investissement Éolien and Investimento Eolico Unipessoal. These entities carry renewable assets in the United States, Canada and Portugal respectively, which were transferred from EDF Renewables to EDF Invest in 2020.

List of main entities included in the consolidation scope of the social, societal and environmental data as of 31/12/2020	Scope of societal and environmental indicators	Scope of social indicators
Électricité de France	X	X
SEI	X	X
Enedis	X	X
EDF PEI	X	X
Électricité de Strasbourg	X	X
EDF Renewables	X	X
ENR	X	X
Dalkia	X	X
Framatome	X	X
Citelum		X
G2S		X
CHAM		X
Cyclife	X	X
EDF Trading	*X	X
EDF in the UK	X	X
Edison	X	X
IZI Solutions		X
Luminus	X	X
EDF Belgium	X	
EDF Norte Fluminense	X	X
MECO	X	X
China Holding	X	X
Solar Invest	X	
Wind Invest	X	
Renewables Portfolio	X	
Investissement Éolien	X	
Investimento Eolico Unipessoal	X	

* *Only the subsidiary EDF Trading North America and its own subsidiary EES – EDF Energy Services (USA).*

(1) Group reporting guidelines, chapter 6.

3.7.2 Details relating to the CSR information

3.7.2.1 Details on the issues arising from the materiality matrix of the EDF group

Methodological details

A materiality matrix cross-referencing the priority CSR issues of both stakeholders and the EDF group was published in 2018 on the basis of the methodological principles contained in the AA1000 standard on stakeholder involvement in identifying, understanding and responding to sustainable development issues and concerns, as well as on the basis of the GRI Standard 101, which provides guidelines in relation to quality and content of reporting in order to meet stakeholder expectations. The methodology [(1)] was implemented through four key stages:

- the first stage was identifying the issues through the mapping of EDF's existing and emerging sustainable development issues, in the form of interviews with international experts (Key Opinion Leaders), members of the Executive Committee of the Group and its subsidiaries, as well as benchmarks and appropriate bibliographical data. The issues, reflecting both risks and opportunities for all the EDF group's activities, were selected according to four criteria: link with strategy, governance, performance; ability to substantially influence value creation; potential loss of opportunity if the issue was not followed; importance in the eyes of stakeholders or as part of an existing controversy;
- the second stage aimed to assess and evaluate the materiality of the identified issues. Two processes were simultaneously carried out, with internal and external stakeholders. Stakeholders were consulted on the significance of the issue for the EDF group, as well as on the Group's perceived performance on the issue. Each stakeholder defined the notion of "significance" according to its position in the Company or its relationship with the EDF group, which could integrate all or part of the criteria of the GRI 101 Standard (economic, environmental, social impacts, stakeholder interest, future challenges, etc.);
- criticality and significance for EDF was assessed by two committees (the non-financial publication committee, bringing together the management of the Trade, Purchasing, Finance and HR Divisions and a second committee bringing together experts and managers from the Strategy, Regulation, Risk, Innovation and CAP 2030 Divisions). Four representatives of trade union organisations (CGT, CFDT, FO, CFE) and four members of the Executive Committee were also consulted at this stage in the form of interviews. This evaluation also made it possible to screen the estimated level of performance (from very good to not taken into account);
- criticality and importance for external stakeholders was assessed by thirteen of the Group's stakeholders interviewed through open and closed questions aimed at gathering qualitative information on the issues and identifying possible issues not identified during the mapping stage. These stakeholders were chosen in line with EDF group's stakeholder mapping (see section 3.9.6 "Stakeholder mapping"), representing public authorities, financial players, customers, suppliers and civil society. These thirteen stakeholders each selected ten issues considered to be the most significant by 2030 from the list of issues formulated in phase 1, or adding new ones if necessary and justified. This evaluation also made it possible to screen the estimated level of performance (from very good to not taken into account);
- the third stage of screening of the issues consisted in questioning the consolidated results through an initial materiality matrix summarising on the abscissa the importance of the CSR issues as seen by the EDF group and on the ordinate axis the importance of these issues for the Group's stakeholders. This phase of dialogue and testing was carried out during a day's work with the EDF group's Sustainable Development Council [(2)], both on the substance of the results obtained (the issues and their ranking) and on the form to be given to them (type of materiality matrix). 35 issues were ultimately selected and prioritised;
- the final stage of collaborative development consisted in a managerial validation process involving the members of the Executive Committee of the Sustainable Development Council, then the members of the Executive Committee of the Innovation and Corporate Responsibility Strategy Department (DIRES) of the EDF group. This process was concluded with the validation by the Innovation, Corporate Social Responsibility and Strategy Director (DIRES).

In 2019, EDF's external stakeholder panel, the Sustainable Development Council, held a new session on the subject of the Group's materiality analysis. It proposed, in line with the best practices in the market, to summarise the number of issues included in the matrix, reducing them from 35 to 18 issues. In 2020, and following the adoption of the Group's *raison d'être*, the formalisation of the Group's extra-financial issues was again examined by the Sustainable Development Council, particularly with regard to the non-financial risks in the Group's risk mapping, which was reduced from 18 to 16 priority issues.

Details on the CSR issues

16 high-priority CSR issues	How the group is taking on the issues at stake
Carbon trajectory	For its aim of becoming carbon neutral by 2050, its carbon trajectory targets are split into medium-term (2030) and short-term (2023) targets. With carbon-free nuclear power generation as its basis, this vision is coupled with a renewable energy development target, a coal phase-out commitment and a high level of involvement in the TCFD climate governance scheme advocated at the international level.
Carbon offsetting	For the EDF group, use of carbon offsetting is the final stage of a process to achieve neutrality. Carbon offsetting must not under any circumstances take the place of a strategy designed to drastically reduce the Group's emissions, whether direct or indirect. In addition to achieving carbon neutrality by 2050, carbon offsetting can enable an immediate contribution to the transition towards a low-carbon society and meet the expectations of EDF group stakeholders.
Adapting to climate change	In 2020, the Group began updating its climate change adaptation strategy, adopting a holistic approach covering not only physical risks but also transition risks. This national strategy goes hand in hand with adaptation plans developed by each of the Group's entities, to be updated at least once every five years.
Developing electricity use and energy services	The development of uses of electricity is a key tool to achieve a carbon-free economy, provided that the electricity is mainly carbon-free. EDF contributes to this goal *via* solutions tailored to different markets (domestic customers, businesses, and local authorities) and also develops a range of innovative cross-disciplinary solutions.

(1) The Group was supported by the firm Utopies.

(2) Sustainable Development Council, see section 3.5.1.2 "Stakeholder panels".

16 high-priority CSR issues	How the group is taking on the issues at stake
Biodiversity	The challenges of carbon neutrality go hand in hand with the protection of biodiversity, one of the Group's long-standing commitments. In 2020, the Group renewed its commitment through two voluntary schemes supported by the French government: "Entreprises engagées pour la biodiversité – act4nature France", a corporate biodiversity scheme run by the Office français de la biodiversité (French Biodiversity Office) and "Act4nature International" run by Entreprises pour l'environnement (Epe).
Soils	The Group wants to act responsibly with regard to the land it holds or uses under concession. In this context, the Group's businesses and subsidiaries is committed to giving the utmost importance to the energy density of its projects, preventing the risks of pollution, reducing waterproofing, limiting soil artificialisation, and developing the value of the land in compliance with regulations.
Water	As a manager and major user of water resources, the Group aims to work towards integrated and responsible water management. As such, the Group is committed to protecting and managing water in an integrated and sustainable manner, both in terms of quantity and quality, as well as sharing water within the territories in which it operates.
Radioactive waste – Circular economy	An optimal use of the natural resources consumed through its value chain is a key part of the Group's corporate responsibility policy. In this context, the Group is committed to promoting a circular economy approach, to avoiding the production of conventional waste and promoting the reuse, recycling and recovery of products/materials throughout the value chain, to eliminating or substituting substances that pose a risk to the environment and people, and to assuming its responsibilities with respect to radioactive waste.
Nuclear safety, health and security	The Group is committed to protecting the health and safety of all individuals. To this end, the Group, through its relevant businesses and subsidiaries, is committed to developing the highest standards in terms of nuclear and hydropower safety, health and safety policy and environmental health.
Ethics and human rights	The EDF group promotes a culture of integrity and applies a zero tolerance policy towards fraud and corruption. Ethical conduct in accordance with the law is the absolute rule for all Group employees, at all levels of the organisation, and without exception. The Group is committed to respecting and ensuring respect for human rights in all its activities and wherever it operates.
Equality, diversity and inclusion	The EDF group is committed to developing concrete action to promote equality in the workplace and occupational and social integration for disabled people, combating sexism, violence and all forms of discrimination, developing support for parents, maintaining and perfecting a high level of social dialogue, securing the skills required for the Group's business lines over the long term, by integrating all aspects of sustainable development into its operations and projects and giving employees an opportunity to develop their employability throughout their careers.
Energy poverty and social innovation	The Group confirms and renews its commitment to its most vulnerable customers, by increasing the understanding of this diverse, complex reality, implementing support solutions based on public solidarity schemes and specific initiatives and developing various forms of social innovation and sponsorship.
Dialogue and consultation with stakeholders	The Group is striving to organise a global initiative of dialogue and consultation which is transparent and open for each new project, and which involves local and indigenous communities throughout the lifecycle of those projects.
Local development	The EDF group is committed to contributing to the development of the regions where it operates, by creating local jobs, purchasing locally and creating economic value and providing a tax revenue. The EDF group is also committed to developing low-carbon sources of energy and access to energy in developing countries.
Development of industrial sectors	The Group is committed to contributing to the development of the industrial sectors needed for the energy transition (marine energies, offshore wind power, floatovoltaics, batteries, hydrogen etc.) or their revitalisation (nuclear) by redeploying the necessary skills, developing skills and setting up support, retraining and protection schemes for employees for a just transition.
Digital technology	The Group is committed to the security of information systems and tangible and intangible assets, both in terms of the technical expertise and systems required and the conduct of users, addressed through all types of awareness-raising initiatives. The Group is committed to a responsible and sober digital transformation, reducing the carbon footprint of both the Group and its customers. The Group strives to improve the accessibility of information (open data), with a view to innovation and inclusion.

Details on the relationship between the issues arising from the materiality matrix and the non-financial risks arising from the Group's major risk mapping (chapter 2)

Issues from the *raison d'être*	CSR issue topics from the materiality matrix	Relation with the non-financial risks identified in the EDF group major risk mapping
Carbon neutrality and the climate	Carbon trajectory	Adaptation to climate change – transition risks (3B)
	Carbon offsetting	
	Adapting to climate change	Adaptation to climate change – physical risks (3B)
	Developing electricity use and energy services	Transformation capacity in the face of disruptions – Downstream transformation (3A)
Preserving the planet's resources	Biodiversity	Industrial safety risk and impact on environmental assets and biodiversity (4G)
	Soils	Management of large industrial projects – risk of conflict in the use of land (4A) / Industrial safety risk and impact on environmental assets and biodiversity – risk of soil pollution (4G)
	Water	Industrial safety risk and impact on environmental assets and biodiversity – risk of water pollution (4G) / Risk relating to adapting to climate change – Risk of conflict in the use of resources (3B)
	Radioactive waste – Circular economy	Risk relating to control of radioactive waste treatment and decommissioning of nuclear facilities (5B)
Well-being and solidarity	Nuclear safety, health and security	Nuclear safety risks during operation (5C) / Risk relating to hydro power safety (4B)/Risk relating to occupational health or safety (employees and service providers) (4C)
	Ethics and human rights	Ethics and compliance risk (1E) / Risk relating to the duty of care: Risks related to supply chains (4E) and management of large industrial projects (4A)
	Equality, diversity and inclusion	Risk related to the development of employees' skills – professionalisation action and inclusive employer approach (3C)
	Energy poverty and social innovation	Risk related to insufficient compensation for missions of general interest (1H)
Responsible development	Dialogue and consultation with stakeholders	Risks related to the management of large industrial projects – consultation of stakeholders and acceptability aspect (4A)
	Local development	Risks related to the operational continuity of supply chains and contractual relations – responsible procurement approach (4E) / Risk related to the management of large industrial projects – local development of projects (4A)
	Development of industrial sectors	Risk relating to management of large industrial projects (4A)
	Digital technology	Risk related to attacks against assets, including cyberattacks (4D)

Details on the changes in the concordance table in section 8.5.4

The concordance table in section 8.5.4 of the 2019 URD mentioned 13 non-financial issues/risks; this number has increased to 16 in the concordance table presented in section 8.4.4 of the 2020 URD (the 16 CSR issue topics in the materiality matrix). The table shows the correspondence between the issues presented in 2020 and the issues presented in 2019.

2020	2019
16 CSR issue topics (from the 2020 materiality matrix)	**Risk issues/factors identified in 2019 with the section 8.5.4 concordance table**
Issue relating to Carbon trajectory	Issue relating to Climate
	Issue relating to Energy mix
Issue relating to Carbon offsetting	Issue relating to Climate
Issue relating to Adapting to climate change	
Issue relating to Development of electricity use and energy services	Issue relating to Energy efficiency
	Issue relating to Innovation, sustainable cities and diversification of solutions
Issue relating to Biodiversity	Issue relating to Biodiversity and environmental heritage
Issue relating to Soils	
Issue relating to Water	
Issue relating to radioactive waste - circular economy	Issue relating to Radioactive waste and spent fuel management issues
Issue relating to Nuclear safety, health and security	Issue relating to Nuclear fleet safety
	Issue relating to Health and safety
Issue relating to Ethics and human rights	Issue relating to Ethics and Compliance
Issue relating to Equality, diversity and inclusion	Issue relating to Equal opportunity
Issue relating to Energy poverty and social innovation	Issue relating to Energy insecurity for individual customers
Issue relating to Dialogue and consultation with stakeholders	Issue relating to Consultation with stakeholders
Issue relating to Local development	Issue relating to Responsible subcontracting
Issue relating to Development of industrial sectors	Issue relating to the Adaptation of skills
Issue relating to Digital technology	-

3.7.2.2 Details on performance indicators

Issue relating to Carbon trajectory

EDF group direct [1] greenhouse gas emissions (scope 1)

EDF group scope 1 emissions (CO_2 equivalent) are comprised of direct emissions of CO_2, N_2O, CH_4, SF_6 and other minor emissions, estimated based on the full GHG report for year N-1, *i.e.* 0.46Mt of CO_2e (2% of scope 1) in 2020. The Global Warming Potential (GWP) coefficients were updated for 2020 based on the most recent reference from the latest IPCC report (see 5th IPCC report: www.ecoinvent.org/database). They are 30 for CH_4, 23,500 for SF_6 and 265 for N_2O. The scope covers the Group. The 2020 value for this indicator is subject to reasonable assurance check by KPMG SA (√).

Carbon intensity: specific CO_2 emissions due to heat and electrical generation

The indicator is the ratio of the direct CO_2 emissions of electricity and heat generating plants to their related generation. The scope covers the Group. The 2020 value for this indicator is subject to reasonable assurance check by KPMG SA (√).

Net consolidation of renewable energy capacity

The net consolidation gives an overview of the Group's assets and liabilities. This method takes account of all subsidiaries in which the Company has a shareholding (*i.e.* shareholding in subsidiaries, associated companies, and joint ventures), and the data is consolidated to the tune of the percentage held by the entity. An exception is made for Dalkia, whose renewable electricity capacity is fully consolidated because of its low contribution to Group figures (< 1%). The scope covers the Group.

Issue relating to development of electricity use and energy services

Number of smart meters installed

The indicator takes account of the total number of smart meters installed (set up) on 31 December of the fiscal year. This total includes all meters installed since the start of the smart meter deployment programme. The Group's only entities with this activity are Enedis, SEI, EDF in the UK and the International Division. The scope covers the Group.

Electric Vehicles rate in the fleet of light vehicles

The indicator is the ratio between the number of electric vehicles (according to the low carbon criteria of the EV 100 initiative)[2] and the total number of vehicles in the EDF group's fleet of registered light vehicles at 31 December 2020 (owned or long-term leased). It should be noted that although this does not have a significant impact on the Group's figures, the number of light vehicles in the fleet of certain companies is not updated on an annual basis. From 2026, light emergency service vehicles following a major climate event will, in accordance with the EV 100 initiative, be deducted from the total number of EDF group vehicles. The scope covers the Group.

Issue relating to Biodiversity

Achievement rate of Group commitments under the Act4nature International initiative

EDF has introduced this indicator in 2020, replacing the previous indicator relating to the ecological knowledge of land. This new indicator reflects the Group's commitments in the Act4nature international system, which is a Group-wide initiative.

(1) Direct carbon emissions, excluding life cycle analysis of generation plants and fuel.

(2) 100% electric battery-powered vehicle, rechargeable hybrid vehicle with an electrical range of at least 50km, vehicle equipped with a range extender with an electrical range of 50km, hydrogen vehicle.

The objectives are labelled in the external "Act4nature international" scheme, supported by the Business for Nature initiative. This indicator is calculated in the form of an achievement rate for the actions undertaken from 2020 to 2022 (these actions relate to taking biodiversity issues into account in the biomass policy, CO_2 emissions, R&D, internal governance, Green Bonds, awareness-raising and training, etc.). The scope covers the Group.

Issue relating to Water

Water intensity: water consumed/electricity generated by fleet (l/kWh)

The indicator is the ratio of water consumed to the Group's total electrical generation. Water consumption for heat generation and other Group activities is taken into account to calculate the indicator. Their negligible quantity (< 0.1%) is not sufficient to change the indicator value. The scope covers the Group. The 2020 value for this indicator is subject to reasonable assurance check by KPMG SA (√).

Issue relating to radioactive waste and circular economy

Solid radioactive waste from operations

The indicator concerns solid waste from the active nuclear generating fleet. In France, the indicator covers long-lived high- and intermediate-level waste. In the UK, the indicator covers low-level waste (only category of radioactive waste transported off generation sites). The scope covers the Group where radioactive waste-related activities concern: EDF and EDF in the UK.

Issue relating to Safety, health and security

Nuclear safety: Number of significant level 2 events on the INES scale

The indicator concerns the number of level-2 major events on the INES (International Nuclear Event Scale). The scope covers the Group.

Overall LTIR (employees and providers)

The Group's overall frequency rate represents the number of work-related accidents (employees and service providers, regardless of the level of subcontracting, including co-contracting and temporary employees) having resulted in one day or more of absence over a 12-month period per million hours worked. The hours worked used for calculating the frequency rate are actual hours corresponding to the hours of "exposure to risks" according to CNAM (French national insurance body). The scope covers the Group.

As regards temporary employees and service providers, the accidents are declared by the temporary employment agency and by the service provider's employer in accordance with applicable local labour regulations. These include accidents that occurred in the course of work performed on behalf of EDF group on its facilities, equipment, sites, networks, etc. Activities conducted by service providers on their own sites, outside EDF group's facilities, are not taken into account.

For a "contracting" company, subcontracting involves entrusting a company, known as the "service provider", with carrying out one or more projects involving studies, design, development, manufacturing, implementation or maintenance. These include any interventions carried out by subcontractors under a contract on EDF group's facilities, equipment (sites, networks, etc.) within the scope of subcontracting as set out in section 3.4.2.3.4 "Responsible subcontracting". These include the number of workplace accidents declared in accordance with applicable local labour regulations, the circumstances of which demonstrate that they are work-related. Dizzy spells and accidents during team-building activities, and accidents in daily life occurring in the workplace are not taken into account.

Number of fatal accidents connected to business-specific risks (employees and providers)

The indicator takes account of the number of fatal accidents linked to business risks occurring in the year. The scope covers the Group.

Fatal accidents involving employees linked to business risks correspond to fatal accidents of employees at work, employees of the Company, including work-study students and apprentices. Fatal malaises are excluded from this scope. Employee transit accidents while on work-related business are taken into account, excluding those occurring in transit between home and work.

Fatal accidents involving service providers linked to business risks include fatal accidents involving service providers that occurred during the course of work performed on behalf of the Company regardless of the level of subcontracting. Malaises are excluded from this scope. Employee transit accidents while on work-related business are taken into account, excluding those occurring in transit between home and work.

Issue relating to Ethics, compliance and human rights

Proportion of executives who have completed the anti-corruption training programme

The indicator is the ratio of the executives who have completed the anti-corruption training programme to the Group's total number of executives. Executives, for EDF, are staff included in categories D1, D2, and D3 as well as members of the Executive Committee and, for subsidiaries, members of general management. An executive is considered to have completed the anti-corruption training programme when they completed at least one anti-corruption training and have received the certificate for this course (certifying that the full training programme has been completed). The calculation methodology was revised in 2020 to include only executives currently serving. The scope covers the Group, except for RTE and Enedis.

Issue relating to Equality, diversity and inclusion

Gender balance index: percentage of women in the Management Committees of the Group's entities

Management Committees are decision-making bodies with part or all of the following features:

- the Chairman of the Committee is an executive manager or senior manager;
- the Chairman of the Committee has a delegation of authority over capital expenditure related to the Company's objects;
- the Chairman of the Committee has disciplinary authority over all or some of the entity's employees;
- the number of members of the Committee represents 1.5-2% of the entity's total staff;
- the Committee meets at least once a month.

Members of more than one Executive Committee within one subsidiary, or members of both a subsidiary's Executive Committee and an EDF group Executive Committee are only counted once. This indicator is calculated by finding the ratio of the number of women on Executive Committees to the number of people on the Executive Committees. The scope covers the Group.

Percentage of employees who have benefited from a skills development action

The indicator is calculated by finding the ratio of the number of employees having benefited from a skills development action to the actual workforce at the end of the period. Skills development actions include training courses, hours spent in school by people on professionalisation contracts and professionalisation actions. Professionalisation actions are intended to transform theoretical skills and knowledge taught mainly in training into practical skills, anchored by their implementation in work situations. They have been formally integrated into the definition of the indicator for 2020. The trainings for which supporting documentation is not received on the date of closure of the report and professionalisation actions which are not registered with a supporting document shall not taken into account. As of 2021, all professionalisation initiatives will be recorded in the MyHR Group tool, which will make it easier to monitor them. The scope covers the Group.

Rate of employees covered by a collective bargaining agreement

The social dialogue indicator is a new Group-wide indicator that measures the existence of collective bargaining agreements in the main controlled companies. Collective bargaining agreements guarantee the reality of negotiations with employee representatives with a view to defining the status of employees and may be national, regional, or specific to a sector, an organisation or a site, in line with ILO [(1)] principles. There are two types of collective bargaining agreements:

- collective bargaining agreements for divisions are written agreements on working conditions with an employer, a group of employers or one or more professional organisations;

(1) International Labour Organization.

- collective bargaining agreements for employees are agreements involving one or more employees representative organisations or, in the absence of such bodies, the representatives officially elected by the employees and authorised by the employees to represent them, in accordance with national laws and regulations in force.

Through the channel of HR managers, each division or subsidiary reports once a year on the number of employees benefiting from a collective agreement. The indicator is the ratio between these employees and the actual workforce at 31 December. The scope covers the Group.

Issue relating to energy poverty and social innovation

Number of energy support

The indicator takes account of the number of cases of support provided to any customers experiencing difficulties. This support is intended to assess the situation and propose the most appropriate solutions. The scope covers EDF.

Issue relating to dialogue and consultation with stakeholders

Proportion of projects on which there is consultation in accordance with the Equator Principles

The indicator is the percentage of projects worth more than €50 million, with a significant impact on regions or the environment, examined at Executive Committee Commitment Committee meetings during the fiscal year, and on which there was consultation in accordance with the Equator Principles. The scope covers the Group.

Issue relating to responsible territorial development

Annual rate of procurement from SMEs in France

The indicator is the ratio, expressed as a percentage, of the annual volume of procurement by EDF SA and Enedis from SMEs located in France, to the annual volume of total procurement in France by EDF SA and Enedis. SMEs are identified based on INSEE (French National Institute of Statistics & Economic Studies) categories, stipulating that an SME (Small- and Medium-Sized Enterprise) has fewer than 250 staff and annual turnover not exceeding €50 million. Suppliers are ranked in the SME category by a service provider that EDF tasks with analysing the supplier list, checking that these SMEs are not controlled above 25% by a Big Business or by an MMC. The scope covers France, where the SMEs' locations are certified based on their French business number (SIREN).

Issue relating to the responsible digital development

Number of customer visits on digital consumption monitoring platforms

This indicator counts the number of customer visits on digital consumption monitoring platforms. The scope covers EDF (excluding overseas departments and Corsica) given that the deployment of digital platforms in those areas has not been finalised.

3.7.2.3 Further details on social, environmental and societal data from the Statement of non-financial performance

The environmental and societal data in the Statement of non-financial performance are based on methodological sheets. This is the Group's standard for non-financial reporting in force in 2020. All of the indicators relating to consumption and emissions are the electricity and heat generation and marketing data, and to &other processes related to these activities. If data are missing, particularly during the last days of the year, estimates are made on the basis of the best information available at that date.

Dalkia's environmental indicators in relation to energy are consolidated over a sliding year, from 1 December N-1 to 30 November N. Other indicators are reported over year N.

Details of the Group's greenhouse gas report

Every year, EDF draws up a GHG report (scopes 1, 2 and 3) covering the Group scope calculated according to the principles of the GHG Protocol Corporate Standard.

- scope 1 covers the direct emissions generated by our assets: CO_2, CH_4 and N_2O emissions from power and heat generation plants, consumption of fossil fuels for heating, fuel consumption of the fleet of vehicles and machinery, fugitive emissions from hydropower plant reservoirs, fugitive emissions of SF_6 and refrigerating agents;
- scope 2 covers indirect emissions linked to losses in the electricity networks of our electricity distribution companies and those linked to the purchase of energy for our own needs: electricity consumption of tertiary buildings and data centers, consumption of heating and chilled water networks for our own use;
- scope 3, which comprises 15 categories (GHG Protocol), covers other indirect emissions generated by our suppliers (purchases of goods and services, upstream of fuels including nuclear, leased assets, downstream freight of by-products), and by our customers (upstream and combustion of gas purchased for resale to end customers, production of electricity and heat purchased for resale to end customers) or at our facilities (depreciation of emissions linked to the manufacture of fixed assets, emissions from non-consolidated investments, upstream and losses linked to the transport and distribution of electricity, upstream and losses of electricity, heat and cold consumption for own use, waste management, travels of employees, etc.) [1].

Due to the complexity of gathering information in January, certain categories of GHG Protocol items are estimated based on the GHG report for the year N-1 (2019) and updated in the current year for the following fiscal year. The total emissions of these estimated items represent 1% of the emissions of the 2020 GHG report.

Further details on the quantity of electricity and heat generated from renewable energies

Regarding Dalkia, the quantity of electricity is measured, and the quantity of heat generated using renewable energies is estimated through benchmark yields based on renewable fuel consumption.

Further details on the indicators relating to water

Indicators on cooling water include water withdrawn and water returned to rivers, the sea and water tables. For nuclear power electricity plants located on coastlines and for thermal power plants, the amounts of cooling water withdrawn and water returned are calculated on the basis of the operating time and nominal debit of pumps.

This indicator does not include data for the MECO company, as water consumption is negligible (open cooling circuit). Furthermore, these indicators are not collected for EDF RE, a subsidiary of EDF Renewables in the United States, as their value is negligible at Group level and for the Edison operating centers managed by Fenice.

Further details on air emissions

Air emissions from thermal power plants of the EDF group are measured or calculated on the basis of analyses of the fuels or based on standard emissions factors.

The Group's SF_6 emissions are calculated, as a matter of priority, on the basis of a mass balance or, to a lesser extent, using an estimation method approved by Executive Management at the entity in question (for example, application of a leakage rate).

Emissions from certain power plants are not material for the Group and as such are not reported. This is the case for dust emissions from CCGT power plants (excluding EDF), N_2O and SF_6 emissions from MECO's CCGT power plant, and emissions from Dalkia Barkantine's power plant in the United Kingdom.

Further details on conventional waste

The conventional waste data were obtained on the basis of data available on the closing date for the quantities removed and the disposal channels. The reported data are not comprehensive concerning conventional industrial waste from EDF Renewables, as these data cannot, at this stage, be reported within the Group's reporting deadlines. Dalkia reports on the most significant facilities for year N-1 for France and for international subsidiaries from January N to December N, using an estimate for this final month.

(1) On the results of the Group's greenhouse gas report in 2020, see section 3.1.1.2.2.

Construction and decommissioning waste is included in this report, if its management falls under the responsibility of the EDF group. Regarding distribution network operator Enedis, waste reporting is done on a rolling-year basis, from 1 November N-1 to 31 October N.

Further details on radioactive waste

EDF

Indicators pertaining to "short-lived Very Low Level radioactive Waste (VLLW) from operations and from decommissioning" take into account the actual volume of the short-lived VLLW directly evacuated from the Industrial Gathering, Storing, and Stockpiling Centre (Centre industriel de regroupement, d'entreposage et de stockage – CIRES) from the production sites;

Indicators pertaining to "Short Lived Low and Intermediate Level radioactive Waste (short lived LLW and ILW) from activity and from decommissioning" take into account the actual volume of the short-lived LLW and ILW waste directly evacuated to the Aube Storage Centre (CSA) from the production sites.

In each case, those volume correspond:

- to the volume of waste produced in the year for operating sites;
- to the volume of waste shipped in the year for sites being decommissioned.

Since 2016, the reduction in the volume contributed by treatment before storage (by ANDRA) has also applied to short-lived VLLW and also to packages sent by Centraco, where applicable. It includes the reduction in volume resulting from treatment before storage (the case of super-compacted waste).

For the indicator "Long-Lived High- and Intermediate-Level solid radioactive Waste" (HILW-LL), the packaging of the waste is taken into account in the calculation.

Given the technical constraints linked to processing operations, the packages are produced approximately ten years after the fuel has effectively generated waste. The indicator is thus an estimate that relies on the long existence of current practices of packaging of Long-Lived waste that projects the current packaging ratio into the near future (number of packages effectively created following the processing of one tonne of fuel). This ratio essentially depends on the mixtures used to optimise the operations:

- for waste generated directly by spent fuel: it is produced by factors from the National Inventory of Radioactive Materials and Waste carried out by the National Agency for Radioactive Waste Management (ANDRA);
- for waste not generated directly from fuel (control rods, etc.) and for which an average lifespan of 10 years is assumed: it is produced on the basis of feedback.

Framatome

Radioactive waste data from Framatome in France is similar to EDF's dismantling waste and so can be consolidated. Internationally, Class A waste (USA and Belgium), comparable to very low level waste (Germany), are not consolidated with French figures. Radioactive waste is shipped and handled in accordance with domestic regulations in force in each country.

EDF in the UK

The data relating to the indicator "Intermediate-Level radioactive Waste" of nuclear activities of EDF in the UK, are founded on the inventory of radioactive waste produced during the year, established by the Nuclear Decommissioning Authority. This is an estimate of the annual volume of waste that will be considered and classified as Intermediate-Level radioactive Waste at the end-of-life of the nuclear generation sites. These estimates include packaging necessary to allow the transport of wastes off site. All of the Intermediate-Level radioactive Waste is temporarily stored at the nuclear generation sites while waiting for a national decision on their final processing. An update of the national inventory was performed in 2019 and the inventory was published on the official site of the "UK Radioactive Waste Inventory" . "Low Level radioactive Waste" includes dessicants that are sent for processing in the form of Intermediate-Level Waste in compliance with applicable regulations.

Further details on the workforce and transfers

Since 2011, the population considered in data collection is all employees who have a non-suspended employment contract with one of the Group's companies. For entities having left the consolidation scope during the year in question:

- the indicators calculated in aggregate since the start of the year take into account those entities for the period during which they belonged to the scope of consolidation;
- indicators measured at 31 December represent the situation at the end of the year and do not take into account the entities which have left the scope of consolidation.

The workforce includes employees shared between EDF and ENGIE. An employee working 50% for EDF is counted for 0.5 in the published workforce.

The "Other arrivals" and "Other departures" indicators are therefore not included in hirings, resignations or dismissals. They include in particular:

- movements between companies of the Group;
- movements of workers in the electricity and gas industry;
- movements of certain categories of employees, in particular those with rotating shifts, doctors and personnel made available by outside entities.

The 2020 value for this indicator are subject to reasonable assurance check by KPMG SA (√).

Further details regarding the number of hours worked

- Number of hours worked by employees: the value to take into consideration is the number of hours worked and the "time an employee is exposed to risk under the orders of an employer". An additional hour counts as an hour worked regardless of the manner or level of compensation.
- Number of hours worked by service providers: the number of hours worked by service providers can be calculated in various ways depending on the type of contract or the nature of the service performed. When there is no way to formally ascertain the number of hours worked, the hours can be counted using time sheets from services provider employers, through time tracking tools or estimated based on a predetermined fixed hourly rate. Activities conducted by service providers on their own sites, outside EDF group's facilities, are not taken into account. The hours worked during services involving the transport of equipment or merchandise are not taken into account.

Further details on calculating absenteeism

At the Group level, the "average number of absences per employee and per year" is the sum of absences due to sickness, counted in days worked in proportion to time worked by employees and absences due to work-related accidents, counted in calendar days.

In its calculation of absenteeism, EDF includes absences for the following reasons: absences due to sickness, work and travel related injuries as well as absences due to other reasons such as unpaid leave and unjustified absences. Absences related to company and union activities, pre-retirement leave and maternity leave are not included. The number of hours worked used in the calculation of the absenteeism rate is the number of hours theoretically worked. Absences due to part-time work on health grounds are taken into account to the tune of 50% of the contractual working time.

Further details on counting occupational diseases:

In 2020, the number of occupational illnesses is published at Group level according to the definition shared by all the Group's subsidiaries, i.e. the number of employees present on the 31 December having declared an occupational illness during the fiscal year that has not been rejected by CPAM.

Further details on the indicators on employees with disabilities

In countries in which regulations do not impose any mandatory declaration of the number of employees with disabilities, the reported data are provided on the basis of voluntary statements of employees.

Further details of expenditures for skills development actions

Skills development expenditure corresponds to all expenditure incurred for the training and professionalisation of employees (whether or not present at the workforce on 31/12) between 01/01 and 31/12 (based on the completion dates of the actions concerned).

3.8 Non-financial rating

Evaluations by specialised rating agencies and managers of ethical funds indicate the Group's CSR performance, in its benchmark sector. Assessments and rewards underscore external recognition of the Group's sustainable development performance.

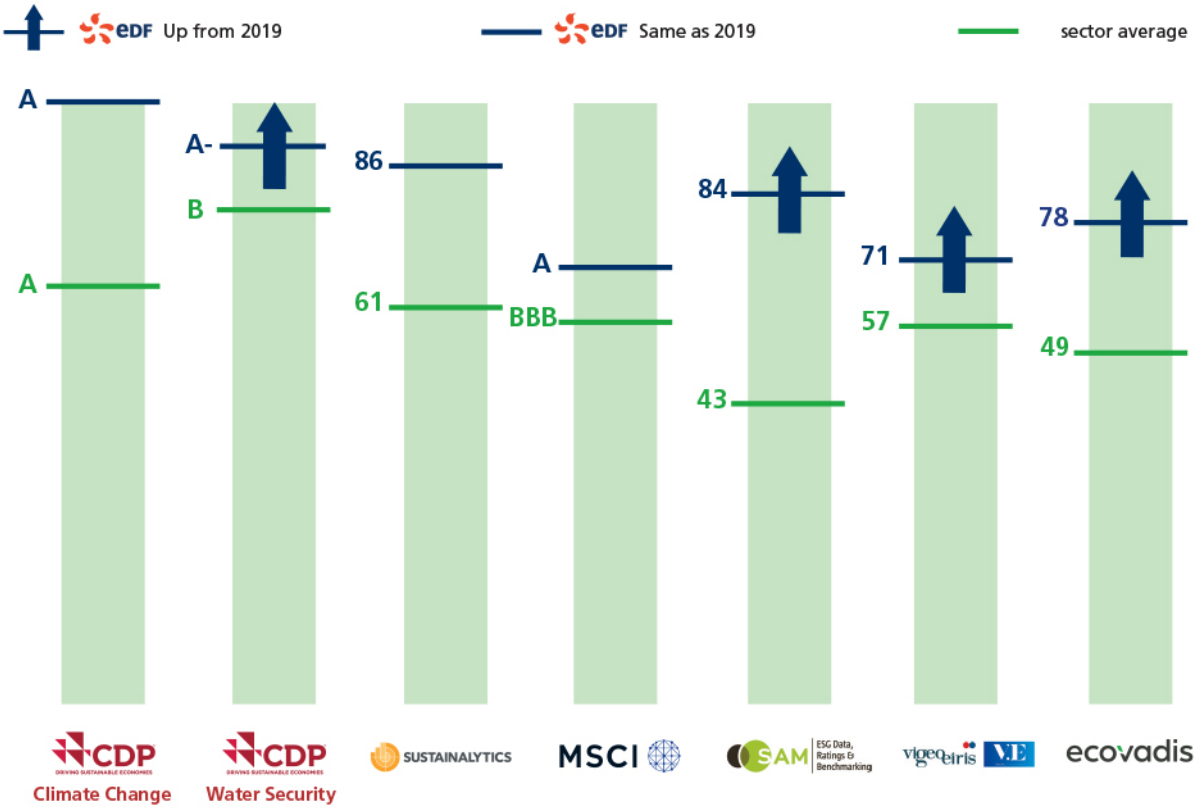
Evolution of extra-financial ratings in 2020

Steady increase in ratings

SAM
+4pts
V.E (ex VigéoEiris)
+5pts
and moving from 6th to 3rd place
Ecovadis
+5pts
and obtaining the platinum medal

Remain in main ESG indexes
(non-exhaustive list)

DJSI World
STOXX ESG Leaders
FTSE4Good
MSCI
Climate Change ESG screened,
ESG Universal, World Climate Change,
Climate CNG EU Paris Aligned
Euronext VE
World 120, Eurozone 120, Europe 120,
France 120



Our main international coalitions

wbcsd · Business Ambition for 1.5°C · We Mean Business · EV 100 by The Climate Group · PPCA Powering Past Coal Alliance · act4nature

3.9 Appendixes and concordance tables

3.9.1 Contribution to UN sustainable development goals

As part of its work, the WBCSD [1] has identified priority Sustainable Development Objectives to which companies in the electricity sector must contribute in order to maximise their positive impacts or minimise their negative impacts [2]. The following table summarises EDF's contribution in relation to this analytical grid, and assesses its contribution in relation to the commitments, policies and actions undertaken (with cross-references to the relevant sections of the Statement of non-financial performance).

Sustainable development Objectives		Priority contribution using WBCSD criteria for the electric utilities sector		Details of commitments, policies and actions carried out by EDF (§ DPEF)	EDF's contribution to each of the Objectives
		Maximising positive impact	Minimising negative impact		
6	Sustainable water management for all		X	Integrated and sustainable water management § 3.2.3; Responsible regional development § 3.4.2 Integrating the maximisation of positive impacts	
7	Affordable and clean energy	X	X	The Group's carbon footprint § 3.1.1; Carbon offsetting solutions § 3.1.2; Adapting to climate change § 3.1.3; Development of electricity use and energy services § 3.1.4; Integrated and sustainable water management § 3.2.3; Waste and the circular economy § 3.2.4; Energy poverty and social innovation § 3.3.4; Responsible regional development § 3.4.2	
8	Decent work and economic growth	X		Development of electricity uses and energy services § 3.1.4; Responsible regional development § 3.4.2	
9	Industry, Innovation and Infrastructure	X		Integrated and sustainable water management § 3.2.3; Waste and circular economy § 3.2.4; Responsible regional development § 3.4.2; Development of industrial sectors § 3.4.3	
12	Responsible Production and Consumption		X	Biodiversity § 3.2.1; Responsible land management § 3.2.2; Integrated and sustainable water management § 3.2.3; Waste and circular economy § 3.2.4; Safety, health and security for all § 3.3.1; Ethics, compliance and human rights § 3.3.2; Dialogue and consultation with stakeholders § 3.4.1; Responsible regional development § 3.4.2; Responsible IT § 3.4.4 Integrating the maximization of positive impacts	
13	Climate action	X	X	The Group's carbon footprint § 3.1.1; Carbon offsetting solutions § 3.1.2; Adapting to climate change § 3.1.3; Development of electricity use and energy services § 3.1.4; Integrated and sustainable water management § 3.2.3; Responsible IT § 3.4.4	
15	Life on land		X	Biodiversity § 3.2.1; Responsible land management § 3.2.1; Waste and circular economy § 3.2.4 Integrating the maximisation of positive impacts	

(1) The World Business Council for Sustainable Development (WBCSD) is a coalition of international companies created in 1995 and united by a common commitment tosustainable development.

(2) WBCSD, Sector Transformation: An SDG Roadmap for Electric Utilities, 2020.

The following table assesses the EDF group's contribution to the other UN Sustainable Development Goals:

Sustainable development Objectives		EDF's contribution to each of the Objectives	Details of commitments, policies and actions carried out by EDF (§ DPEF)
1	Eradication of poverty		Equality, diversity and inclusion § 3.3.3; Energy poverty and social innovation § 3.3.4
2	Food security and sustainable farming		Integrated and sustainable water management § 3.2.3
3	Health and well-being		Safety, health and security for all § 3.3.1
4	Quality education		Biodiversity § 3.2.1; Ethics, compliance and human rights § 3.3.2; Development of industrial sectors § 3.4.3
5	Gender equality		Equality, diversity and inclusion
10	Reduced inequalities		Ethics, compliance and human rights § 3.3.2; Responsible regional development § 3.4.2
11	Sustainable cities and communities		Development of electricity uses and energy services § 3.1.4; Responsible regional development § 3.4.2
14	Marine aquatic life		Biodiversity § 3.2.1; Integrated and sustainable water management § 3.2.3
16	Peace, justice and strong institutions		Ethics, compliance and human rights § 3.3.2; Dialogue and consultation with stakeholders § 3.4.1
17	Partnerships to meet objectives		Responsible regional development § 3.4.2

3.9.2 Compliance with best international standards

Global Compact [1]

The United Nations Global Compact brings together, under the aegis of the UN, companies and NGOs committed to 10 guiding principles articulated in four areas: human rights, labour rights, the environment and the fight against corruption. EDF has been committed to the United Nations Global Compact since 2001 and has published a Communication On Progress (COP) at "Advanced" level every year since 2012.

The Group also complies with the Declaration of the Rights of the Child, the Convention on the Elimination of All Forms of Discrimination Against Women, the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, and the United Nations Convention against Corruption. EDF promotes international human rights law by recognising the ILO's fundamental conventions, which guarantee fundamental labour principles and rights, and the fight against discrimination.

Global Reporting Initiative (GRI) [2]

The GRI is an independent international non-profit organisation created in 1997 by the association of CERES (Coalition for Environmentally Responsible Economies) and UNEP (United Nations Environment Programme). GRI helps companies and governments around the world to understand and communicate their impact on critical sustainable development issues such as climate change, human rights, governance and social well-being. This enables concrete actions to be taken to create social, environmental and economic benefits for all.

EDF has a long history of integrating developments in the GRI Standards. The concordance table between the Group's indicators and those proposed by GRI is available on the EDF website:

https://www.edf.fr/sites/default/files/contrib/groupe-edf/engagements/rapports-et-indicateurs/2020/edf-group-2020_gri-content-index.pdf

(1) http://www.globalcompact-france.org/
(2) https://www.globalreporting.org/

Sustainability Accounting Standards Board (SASB) [1]

Created in 2011, SASB (Sustainability Accounting Standards Board, SASB) is an independent, non-profit standard-setting body that develops and maintains reporting standards enabling companies around the world to identify, manage and communicate material non-financial and financial information to investors. The SASB standards are evidence-based, developed with broad market participation and are designed to be beneficial to companies and useful to investors. SASB has established standards specific to 77 industry sectors identified in its Sustainable Industry Classification System® (SICS®).

EDF is the first European energy company to act as an advisor within the SASB organisation [2]. As such, EDF is proactively involved in the process of revising this standard to enable its use worldwide.

In 2020, EDF was one of the main contributors to the SASB "Globalization Project" [3], which remains to this day, for certain subjects, specific to the American market, particularly in terms of the environment or regulation.

For items for which the standard is identical (*e.g.* GHG protocol) or close to the standards used in France and Europe, EDF's Statement of Non-Financial Performance Statement in 2020 covers most of the reporting topics required by SASB for the "Electric Utilities & Power generators" sector:

- Greenhouse Gas Emission & Energy Resources Planning: sections 3.1.1.2.2, 3.1.1.3.1, 3.1.1.3.2, 3.1.1.3.3, 3.1.1.3.4;
- Air Quality: section 3.3.1.5;
- Water Management: section 3.2.3;
- Coal Ash Management: section 3.2.4.3.2;
- Energy Affordability: section 3.1.4.3.2;
- End use efficiency and Demand: section 3.4.4.2;
- Nuclear Safety and Emergency management: section 3.3.1.1;
- Grid Resiliency: section 3.1.4.3.1.

3.9.3 Further details relating to compliance with TCFD requirements

This section presents the URD concordance table with TCFD recommendation, as detailed in the report entitled "Implementing the Recommendations of the Task Force on Climate related Financial Disclosures", TCFD, June 2017.

Concordance table with TCFD recommendations	Relevant sections of the URD
Governance	
a) Role of the Board of Directors in the oversight of climate-related issues in the organisation	Section 3.1.3.1
b) Role of the Management in the oversight of climate-related issues in the organisation	Section 3.1.3.1
Strategy	
a) Climate-related risks and opportunities over the short, medium, and long term	Section 3.1.3.2.2 and Appendix 3.9.5 Section 2.2.3
b) Impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	Section 3.1
c) Evaluation of the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Section 3.1.3.2
Risk management	
a) Processes for identifying and assessing climate-related risks	Section 3.1.3.2 Sections 2.1 and 2.2.3
b) Processes for managing climate-related risks	Sections 3.1.2 and 3.1.3.2 Sections 2.1 and 2.2.3
c) Integration into the organisation's overall risk management processes	Section 2.1
Indicators and goals	
a) Financial and non-financial metrics used by the organisation for its climate-related strategy	Section 3.1.1 Section 3.7.2
b) Reporting of Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions	Section 3.1.1.2
c) Climate-related targets used by the organisation and performance against targets	Section 3.1.1.1

(1) sasb.org
(2) sasb.org/standard-setting-process/standards-advisory-group/#if
(3) sasb.org/standard-setting-process/active-projects/standards-internationalization-advancement/

3.9.4 Summary of EDF group climate risks

3.9.4.1 Description of physical risks

Risk category	Description	Potential impact for the EDF group
Risks related to extreme events	Increase of heatwaves and droughts	Production: drop in nuclear production due to heat sink; Low water flow for dams in southern countries; Accelerated wearing of materials; Transmission and Distribution: drop in network capacity; Fire risk; All business lines: rise in the cost of insurance; Deterioration of working conditions for employees and service providers
	Increase of strong wind events, storms, tornados and floods	Production: slow-down or potential temporary halt of production facilities; Impacts of higher flood waters; Transmission and Distribution: power cut offs
Risks related to chronic events	Increase of average temperatures / Increase of sea levels	Production: change and drop in hydropower production; Decreased yield of nuclear and thermal power facilities; Risk of submersion of infrastructures on seacoasts (particularly island regions); Proliferation of organisms that plug water intake; Risk of microbial growth in cooling circuits; Transmission and Distribution: diminished capacity of transmission lines; Sales: drop in heating demand; Increase in air-conditioning demand

3.9.5.2 Description of risks and transition opportunities

Risk category	Description	Potential impact for the EDF group
Legal risks	Climate-related litigation	Risk of cancellation of licences, risk of litigation following exceptional climatic events, risk of litigation related to EDF group publications, particularly as regards the duty of care.
Political and regulatory risks	Tension over uses of water	Risk involved in the sharing of water resources due to multiple uses and multiple stakeholders in a context of increasing water scarcity situations
	Tension over access to land and use of soils	Risk involved in the necessary land resources for renewable energy due to restrictive regulations (biodiversity, agricultural lands) and the legitimacy of sharing with numerous stakeholders.
	Political difficulties to achieve the objectives of the Paris Agreement	Opportunity: as a low-carbon leader, the EDF group is called on to play a key role in decarbonisation of the European economy.
Customer – market risks	Change in customer expectations	Opportunity: increased demands of own consumption, energy efficiency, electric mobility, green deals and low carbon
	Change in uses of electricity	Opportunity: decarbonised electricity is recognised as an indispensable means to deliver decarbonisation to the economy.
Technological risks	Stability and security of electricity networks	Risk/Opportunity: risk of instability to the system in case of a high penetration rate of renewable energies; Key role of nuclear energy usable together with renewable energies to ensure stability of the network
	Transition technologies	Risk/Opportunity: potential emergence of technologies such as CCSU, thermal solar, small modular reactors, storage or in the area of negative emissions
Financial risks	Access to competitive financing	Risk/Opportunity: risk in case of European taxonomy having an impact technologically; Opportunity to provide the EDF group with sustainable financing (Green Bonds, positive incentive loans)
	Stranded assets	Risk of stranded thermal assets after regulatory changes or carbon price increase

The main actions implemented by the EDF group to manage climate-related risks are described in section 2 "Risk factors and control framework" and section 3.2 "EDF, company committed to the energy transition".

3.9.5 Further details of income tax paid in all the countries where the Group has subsidiaries

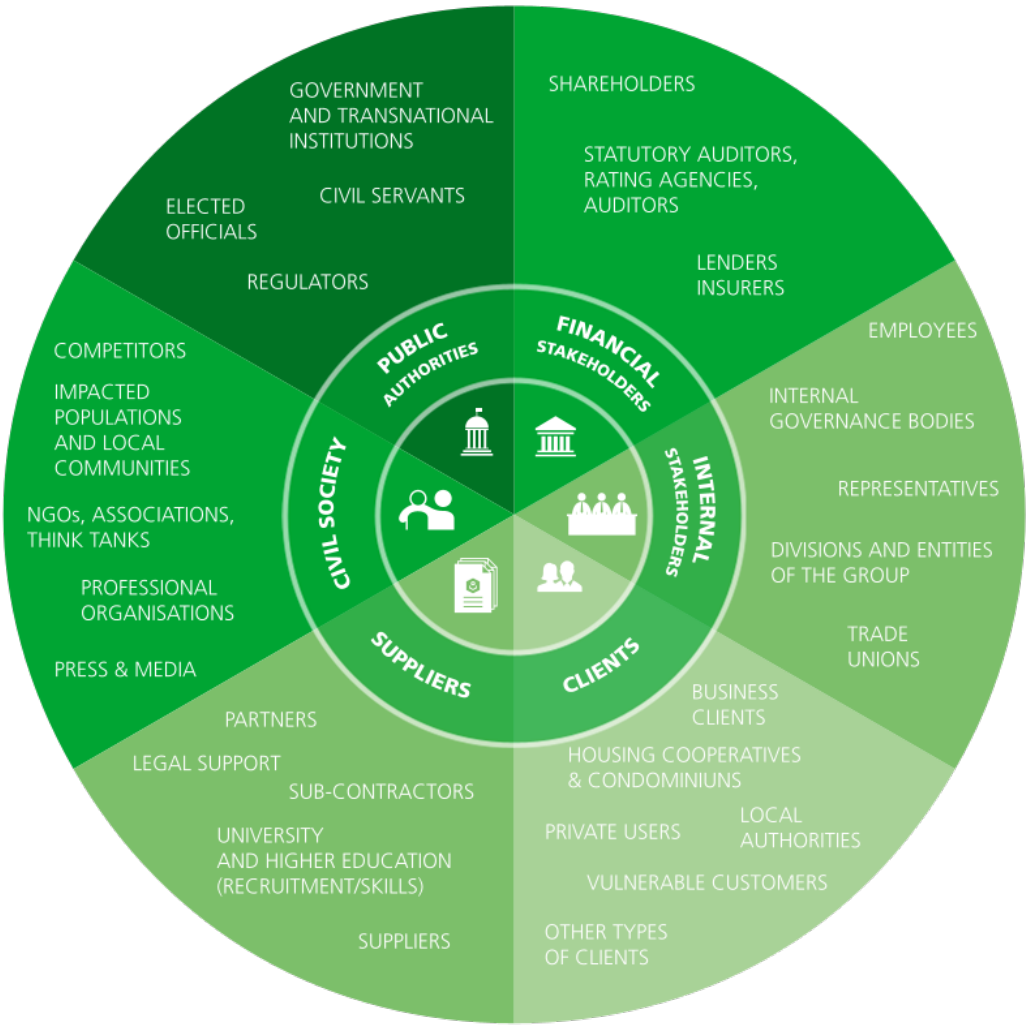
Country *(in millions of euros)*	**2020**	**2019**	**2018***
France	857	780	162
Belgium	70	89	87
Italy	45	38	22
Brazil	47	25	41
Greece	4	3	8
Germany	1	2	1
US	5	2	1
South Africa	1	2	n.s.
United Kingdom	(8)	2	-12
Poland	0	1	1
Ireland	n.s.	1	2
Vietnam	1	1	1
Mexico	(1)	n.s.	2
Slovakia	n.s.	n.s.	n.s.
China	1	n.s.	-14
Luxembourg	n.s.	n.s.	n.s.
Austria	0	n.s.	0
Russia	0	n.s.	n.s.
Switzerland	n.s.	n.s.	0
Turkey	0	n.s.	n.s.
Portugal	0	0	0
Egypt	0	0	0
Norway	(50)	0	16
Singapore	5	0	0
Japan	0	0	0
Hungary	0	0	0
Israel	0	0	0
The Netherlands	0	0	0
Bulgaria	0	0	0
Denmark	n.s.	0	0
Chile	n.s.	-1	1
Spain	n.s.	-7	n.s.
Canada	3	-17	5
TOTAL	**983**	**922**	**325**
Laos (entity accounted for using the equity method)	0	9	7
TOTAL	**983**	**931**	**332**

n.s. : non significant.
** Data published for the 2018 fiscal year were restated in accordance with IFRS 5 for E&P activity currently being disposed of.*

3.9.6 Stakeholder Mapping

Dialogue with stakeholders falls within the domain of the Executive Director in charge of the Department for Innovation of Corporate Social Responsibility Strategy. The general stakeholder mapping was approved by the Executive Committee and relations with local communities are included in the field of internal control.

Mapping provides Group management and companies with a framework for organising dialogue [1]. As part of ISO 9001 and 140001 certification, the Group's Divisions and companies systematically map their stakeholders in order to define appropriate modes of dialogue adapted to their specific context.



(1) Accompanied by a stakeholder action guide produced in 2015 based on the guiding principles of Committee 21.

3.9.7 Report by one of the Statutory Auditors, appointed as independent third party on the consolidated non-financial statement

This is a free English translation of the Statutory Auditor's report issued in French and is provided solely for the convenience of English-speaking readers. This report should be read in conjunction with, and construed in accordance with, French law and professional standards applicable in France.

For the year ended 31 December 2020

To the Annual General Meeting,

In our capacity as Statutory Auditors of your company (hereinafter the "entity") appointed as independent third party, and accredited by the French Accreditation Committee (*Comité Français d'Accréditation* or COFRAC) under number 3-1049[(1)], we hereby report to you on the consolidated non-financial statement for the year ended 31 December 2020 (hereinafter the "Statement"), included in the Management Report pursuant to the requirements of articles L. 225-102-1, R. 225-105 and R. 225-105-1 of the French Commercial Code (*Code de commerce*).

Responsibility of the entity

The Management Board is responsible for preparing the Statement, including a presentation of the business model, a description of the principal non-financial risks, a presentation of the policies implemented considering those risks and the outcomes of said policies, including key performance indicators.

The Statement has been prepared in accordance with the entity's procedures (hereinafter the "Guidelines"), the main elements of which are presented in the Statement and available upon request at the entity's head office.

Independence and quality control

Our independence is defined by the requirements of article L.822-11-3 of the French Commercial Code and the French Code of Ethics (Code de déontologie) of our profession. In addition, we have implemented a system of quality control including documented policies and procedures regarding compliance with applicable legal and regulatory requirements, the ethical requirements and French professional guidance.

Responsibility of the Statutory Auditor appointed as independent third party

On the basis of our work, our responsibility is to provide a report expressing a limited assurance conclusion on:

- the compliance of the Statement with the requirements of article R. 225-105 of the French Commercial Code;
- the fairness of the information provided in accordance with article R.225-105 I, 3° and II of the French Commercial Code, i.e., the outcomes, including key performance indicators, and the measures implemented considering the principal risks (hereinafter the "Information").

Our responsibility is also to provide a report expressing, at the request of the entity and outside of the scope of accreditation, a reasonable assurance conclusion that information selected by the entity, presented in Appendix 1 and identified with the symbol √ in chapter 3 has been prepared, in all material respects, in accordance with the Guidelines.

However, it is not our responsibility to comment on the entity's compliance with other applicable legal and regulatory requirements, in particular the French duty of care law and anti-corruption and tax avoidance legislation nor on the compliance of products and services with the applicable regulations.

Nature and scope of our work

The work described below was performed in accordance with the provisions of Article A.225-1 *et seq.* of the French Commercial Code, as well as with the professional guidance of the French Institute of Statutory Auditors (*Compagnie nationale des commissaires aux comptes* or CNCC) applicable to such engagements and with ISAE 3000 [(2)]:

- We obtained an understanding of all the consolidated entities' activities, and the description of the principal risks associated;
- We assessed the suitability of the criteria of the Guidelines with respect to their relevance, completeness, reliability, neutrality and understandability, with due consideration of industry best practices, where appropriate;
- We verified that the Statement includes each category of social and environmental information set out in article L. 225-102-1 III as well as information regarding compliance with human rights and anti-corruption and tax avoidance legislation set out in article L. 22-10-36;
- We verified that the Statement provides the information required under article R. 225-105 II of the French Commercial Code, where relevant with respect to the principal risks, and includes, where applicable, an explanation for the absence of the information required under article L. 225-102-1 III, paragraph 2 of the French Commercial Code;
- We verified that the Statement presents the business model and a description of principal risks associated with all the consolidated entities' activities, including where relevant and proportionate, the risks associated with their business relationships, their products or services, as well as their policies, measures and the outcomes thereof, including key performance indicators associated to the principal risks;
- We referred to documentary sources and conducted interviews to:
  - assess the process used to identify and confirm the principal risks as well as the consistency of the outcomes, including the key performance indicators used, with respect to the principal risks and the policies presented;
  - corroborate the qualitative information (measures and outcomes) that we considered to be the most important presented in Appendix 1. Concerning certain risks[(3)], our work was carried out on the consolidating entity, for the other risks, our work was carried out on the consolidating entity and on a selection of entities[(4)].
- We verified that the Statement covers the scope of consolidation, i.e. all the consolidated entities in accordance with article L. 233-16 of the French Commercial Code within the limitations set out in the Statement;
- We obtained an understanding of internal control and risk management procedures the entity has put in place and assessed the data collection process to ensure the completeness and fairness of the Information;
- For the key performance indicators and other quantitative outcomes that we considered to be the most important presented in Appendix 1, we implemented:
  - analytical procedures to verify the proper consolidation of the data collected and the consistency of any changes in those data;
  - tests of details, using sampling techniques, in order to verify the proper application of the definitions and procedures and reconcile the data with the supporting documents. This work was carried out on a selection of contributing entities[4] and covers between 16% and 100% of the consolidated data selected for these tests;
- We assessed the overall consistency of the Statement based on our knowledge of all the consolidated entities.

We believe that the work carried out, based on our professional judgment, is sufficient to provide a basis for our limited assurance conclusion; a higher level of assurance would have required us to carry out more extensive procedures.

(1) Accreditation Cofrac Inspection, number 3-1049, scope available at www.cofrac.fr

(2) ISAE 3000: international standard on assurance engagements other than audits or reviews of historical financial information.

(3) Energy precariousness and social innovation; Development of energy uses and services; Biodiversity; Ethics, compliance and human rights; Dialogue and consultation with stakeholders; Responsible territorial development; Responsible digital; Development of industrial sectors; Carbon offset solution; Adaptation to climate change; Integrated and sustainable land management.

(4) The contributing entities are presented in Appendix 2.

Means and resources

Our work was carried out by a team of ten people between November 2020 and February 2021 and took a total of about forty weeks.

We were assisted in our work by our specialists in sustainable development and corporate social responsibility. We conducted around forty interviews with the people responsible for preparing the Statement.

Conclusion

Based on the procedures performed, nothing has come to our attention that causes us to believe that the non-financial statement is not presented in accordance with the applicable regulatory requirements and that the Information, taken as a whole, is not presented fairly in accordance with the Guidelines, in all material respects.

Reasonable assurance report on a selection of non-financial information

Nature and scope of our work

With regard to the information selected by the entity presented in Appendix 1 and identified with the symbol √ in chapter 3, we conducted the same procedures as those described in the paragraph "Nature and scope of our work" (for the most important non-financial information). However, these procedures were more in-depth, particularly regarding the number of tests.

Consequently, the selected sample represents between 51% and 96% of the information identified with the symbol √.

We believe that these procedures enable us to express reasonable assurance regarding the information selected by the entity and identified with the symbol √.

Conclusion

In our opinion, the information selected by the entity and identified with the symbol √ in chapter 3 has been prepared, in all material respects, in accordance with the Guidelines.

Paris-La Défense, on 17th of February 2021

KPMG S.A.

Fanny Houlliot
Partner
Sustainability Services

Michel Piette
Partner

Jean-Louis Caulier
Partner

Appendix 1: Qualitative information (actions and results) considered most important

Social Information
Actions in favour of the eradication of fatal accidents
Actions in favour of the prevention of harassment and discrimination
Means adopted to promote equal opportunities (professional equality and employment of persons with disabilities)
Mesures for the development of employee skills

Environmental Information
Commitments and actions to address climate change
Actions and financing schemes in favour of green growth, energy transition and the fight against energy precariousness
Use of Green Bonds
Percentage of the Group's investments aligned with low carbon objectives
Measures taken in favour of biodiversity
Share of scope 3 emissions related to scope 1 and scope 2 emissions of minority investments (equity-accounted companies)

Societal Information
Anti-corruption compliance programme and procedures
Functioning and results of the internal ethics and compliance whistleblowing system
Positive impacts on the local economy, territories and employment
Social innovation actions and patronage

Key performance indicators and other quantitative results considered most important

Social key performance indicators and outcomes	Level of assurance
Workforce as of 31/12/2020 and breakdown by age and gender	Reasonable
Percentage of women at managerial level	Limited
Gender balance index: percentage of women in the Management Committees of the Group's entities	Limited
Total number of skills development hours	Limited
Number of employees who have taken part in a skills development initiative	Limited
Percentage of employees who have taken part in a skills development initiative	Limited
Skills development expenditure	Limited
Number of employees who have not taken part in a skills development initiative for 3 or more years	Limited
Number of days of absence per employee per year	Limited
Occupational illnesses	Limited
Number of fatal accidents connected to business-specific risks (employees and providers)	Limited
Global LTIR (employees and providers)	Limited
Accident severity rate (employees)	Limited
Rate of employees covered by a collective agreement	Limited

Societal key performance indicators and outcomes	Level of assurance
Number of visits on digital consumption monitoring platforms	Limited
Number of smart meters installed	Limited
Nuclear safety: Number of significant level 2 events on the INES scale	Limited
Number of energy support	Limited
Proportion of projects on which there is consultation in accordance with the Equator Principles	Limited
Proportion of executives who have completed the anti-corruption training program	Limited
Annual rate of procurement from SMEs in France	Limited

Environmental key performance indicators and outcomes	Level of assurance
EDF group direct greenhouse gas emissions (scope 1) *($MtCO_2eq$)* [(1)]	Reasonable
Carbon intensity: specific CO_2 emissions due to electrical generation *(gCO_2/kWh)*	Reasonable
EDF group indirect greenhouse gas emissions (scope 2) *($MtCO_2eq$)* [(1)]	Limited
EDF group indirect greenhouse gas emissions (scope 3) *($MtCO_2eq$)* [(1)]	Limited
Emissions from electricity purchased and sold to end customers	Limited
Emissions from gas sold to end customers	Limited
Installed net renewable electricity generating capacities *(GW)*	Limited
EDF group's Electric Vehicles rate in the fleet of light vehicles *(%)*	Limited
Achievement rate of Group commitments under the "Act4nature international" initiative	Limited
Water intensity: water consumed / electrical production of fleet *(l/kWh)*	Reasonable
Radioactive waste from operations - France: volume of long-lived high and intermediate level solid radioactive waste *(m^3)*	Limited
Radioactive waste from operations - UK: volume of low-level radioactive waste generated *(m^3)*	Limited
Very Low Level radioactive Waste (VLLW) (Group in France)	Limited
Low and Intermediate Level radioactive Waste (LLW and ILW) (Group in France)	Limited
Very Low Level solid radioactive Waste (EDF)	Limited
Short Lived Low and Intermediate Level solid radioactive Waste (EDF)	Limited

(1) The verification rates and coverage rates for indicators relating to greenhouse gas emissions for the Group's scopes 1, 2 and 3 are presented in Appendix 3.

Appendix 2: List the contributing entities in the report

Sample of selected entities

Within EDF	Pôle Compétences Santé au Travail de Mulhouse Sodata Division Combustible Nucléaire - Siège Division Production Nucléaire – Cattenom Division Production Nucléaire – Nogent Division Thermique Expertise et Appui Industriel Multi-métiers – Bouchain EDF SEI – Guyane EDF SEI – SEI head office
Within Enedis	Enedis head office Direction Régionale Nord-Pas-de-Calais
Within Framatome	Erlangen
Within EDF Energy	EDF Energy head office Nuclear power plant of West Burton A
Within EDF Renouvelables	EDF Renouvelables USA EDF Renouvelables UK
Within Edison	Edison head office
Within Dalkia	Lille Direction Régionale Sud-Ouest
Within Luminus	Luminus head office

Appendix 3: EDF Group's verified greenhouse gas emissions assessment

Verified greenhouse gas emissions	Tons of CO_2 equivalent verified	Level of assurance and representation of the selected sample (%)
		Reasonable
100% of the direct scope 1 greenhouse gas emissions presented in the Statement in part 3.1.1.2.2 Summary of the 2020 GHG assessment	28 $MtCO_2eq$	72%
		Limited
100% of the indirect scope 2 greenhouse gas emissions presented in the Statement in part 3.1.1.2.2 Summary of the 2020 GHG assessment	0.3 $MtCO_2eq$	67%
		Limited
100% of the indirect scope 3 greenhouse gas emissions presented in the Statement in part 3.1.1.2.2 Summary of the 2020 GHG assessment	107 $MtCO_2eq$	22%

Faced with the climate change emergency, EDF is committed to a fair, innovative and sustainable energy future, and aims to be carbon neutral by 2050. The Group wants to deploy electricity that is increasingly low in carbon thanks to nuclear power and the accelerated development of renewable energies. In 2020, EDF strengthened its climate governance by appointing Climate point persons to both the Executive Committee and the Board of Directors.

Furthermore, during the health crisis, EDF, demonstrated its dedication to working for the well-being and development of all, thus embodying its *raison d'être* mission statement.

96.3%	6.6	€500 million	69%
BOARD OF DIRECTORS' ATTENDANCE 2020	AVERAGE SALARY EQUITY RATIO (1)	EARLY PAYMENT BY EDF TO SMES (2)	EMPLOYEE ENGAGEMENT INDEX (3)

(1) Ratio of the CEO's compensation to the average compensation of EDF employees.

(2) Invoices between April and June 2020 in France.

(3) MyEDF group internal survey.

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4

CORPORATE GOVERNANCE

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4.1 Corporate Governance Code

EDF adheres to the AFEP-MEDEF Code, which is the Corporate Governance Code to which the Company refers, in accordance with Article L. 22-10-10 of the French Commercial Code subject to the specific laws and regulations applicable to EDF.

These specific laws and regulations, in accordance with EDF's status as a French State-owned company and in particular the application to the Company of Order no. 2014-948 of 20 August 2014 and its implementing texts, and Decree no. 53–707 of 9 August 1953, are detailed in this Universal Registration Document and relate specifically to:

- the composition of the Board of Directors (see section 4.2.1 "Members of the Board of Directors");
- the terms and conditions for the appointment of the Chairman & Chief Executive Officer of EDF and the method of exercising Executive Management (see section 4.2.2.2 "Method of exercising Executive Management – Appointment and powers of the Chairman & Chief Executive Officer"); and
- the terms and conditions for setting the remuneration of the Chairman & Chief Executive Officer (see section 4.6.1.1 "Remuneration policy applicable to the Chairman and Chief Executive Officer").

In addition to the aforementioned specific laws and regulations, the table below sets out the AFEP-MEDEF Code recommendations that are not applied by the Company and the related explanations:

AFEP-MEDEF Code Recommendation	Company's Position	Explanation	Section of the Universal Registration Document
Holding of Company shares by directors Recommendation no. 20: *"[…] the Director should personally be a shareholder and, by virtue of the provisions in the articles of association or the internal regulations, hold a minimum number of shares that is significant in relation to the directors' allocated remuneration. If he or she does not hold these shares when assuming office, he or she should use his or her directors' remuneration to acquire them."*	The Company's articles of association and the Board's internal Rules of Procedure do not require directors to hold a minimum number of shares that is significant in relation to the remuneration they receive for their term of office.	In accordance with the law of 26 July 1983, the directors representing the employees receive no remuneration for their term of office. Furthermore, the remuneration received for their term of office by directors recommended by the French State, who are civil servants, is paid to the French State budget. Directors appointed on the recommendation of the French State, who are not civil servants, can receive only 85% of the remuneration due to them, the remainder being paid to the French State budget. Finally, the Chairman of the Board of Directors does not receive any remuneration for his or her term of office as Director. Taking account of the wide range of situations, the Board has not established a single rule on the holding of the Company' shares. Furthermore, each Director must act in the Company's best interests, irrespective of the number of Company shares they hold personally.	See sections 4.6.3 ("Total remuneration of directors") and 4.5 ("Shareholding by corporate officers and trading in EDF securities by corporate officers and executives").
Requirement for corporate officers to hold shares Recommendation no. 23: *"The Board of Directors defines a minimum number of shares that the corporate officers must retain through to the end of their term of office. […] Until this objective regarding the holding of shares has been achieved, the corporate officers will devote a proportion of exercised options or allocated performance shares for this purpose as determined by the Board."*	The Board of Directors has not prescribed regulations for the holding by the Chairman & Chief Executive Officer of a minimum number of the Company's shares.	The Chairman & Chief Executive Officer does not receive any remuneration for his or her term of office as Director. His or her remuneration is limited in accordance with Decree no. 53-707 of 9 August 1953 amended by Decree no. 2012-915 of 26 July 2012. Finally, the Company has not put in place a stock and/or performance stock option plan in favour of the Chairman & Chief Executive Officer. Accordingly, it was decided not to implement this recommendation. Furthermore, the executive corporate officer must act in the Company's best interests, irrespective of the number of Company shares they hold personally.	See sections 4.6.2 ("Total remuneration of the Chairman & Chief Executive Officer"), 4.6.4 ("Stock options – Bonus shares").
Rules for the distribution of remuneration paid to Directors for their term of office Recommendation no. 21.1: The method of distribution of this remuneration *"should take into account, in such ways as it shall determine, the directors' actual attendance at meetings of the Board and Committees, and the amount shall therefore consist primarily of a variable portion"*.	A significant but not preponderant share of the remuneration paid to Directors for their term of office is dependent upon actual attendance by the directors of the Board and Committee meetings.	Special distribution rules were adopted, which take account in particular of the level of responsibilities and the time spent by the directors on their duties. Though the variable share of remuneration paid for the term of office, that compensates the actual presence of Directors is not preponderant, the Company considers that it is nonetheless significant, insofar as it accounts for 50% of the total amount allocated and, as recommended by the AFEP-MEDEF Code, as it is appropriate to the level of responsibilities assumed by the directors and to the time that they must spend on their duties.	See section 4.6.3 "Total remuneration of directors".

4.2 Members and functioning of the Board of Directors

18 Directors*

58.5 Years old
MEAN AGE

41.7%
INDEPENDENT DIRECTORS**

9
MEETINGS

96.3%
ATTENDANCE RATE

6 Directors appointed by the Shareholders' Meeting

Jean-Bernard LEVY
Chairman and Chief Executive Officer
P

Bruno CREMEL
General Partner and Deputy Chief Executive Officer of Partech
▲ ■

Colette LEWINER
Professional Director
▲ ■ P ■

Laurence PARISOT
Chair and Managing Director of Citi bank France
▲ ■ ■

Claire PEDINI
Senior Vice-President Human Resources and Digital Transformation for the Saint-Gobain Group
▲ ■ P

Philippe PETITCOLIN
Corporate Director
▲ ■ ■

5 Directors appointed by the Shareholders' Meeting on recommendation from the French State

Véronique BÉDAGUE-HAMILIUS
Deputy Chief Executive Officer of the Nexity group, in charge of the "Enterprises and Local Authorities Client"
■

François DELATTRE
Secretary General of the French Ministry for Europe & Foreign Affairs
■

Gilles DENOYEL
Chairman of the Board of Directors of Dexia
P

Marie-Christine LEPETIT
Head of the Inspectorate General of Finance at the Ministry for the Economy, Finance and Recovery
P ■

Michèle ROUSSEAU
Chair of the Board of Directors of the Bureau de Recherches Géologiques et Minières
■

6 Directors elected by the employees

Claire BORDENAVE
Employee Director sponsored by the CGT trade union
■

Jacky CHORIN
Employee Director sponsored by the Force Ouvrière trade union
■ ■ ■

Karine GRANGER
Employee Director sponsored by the CGT trade union
■ ■ ■

Jean-Paul RIGNAC
Employee Director sponsored by the CGT trade union
■

Vincent RODET
Employee Director sponsored by the CFDT trade union
■ ■ ■ ■

Christian TAXIL
Employee Director sponsored by the CFE-CGC trade union
■ ■

1 Director – representative of the French State

Martin VIAL
Commissioner of the French State Shareholdings Agency at the Ministry Economy and the Ministry for Public Action and Accounts
■ ■

- ■ *Member of the Committee*
- P *Chairman of the Committee*
- ■ *Audit Committee*
- ■ *Strategy Committee*
- ■ *Appointments, Remuneration & Gouvernance Committee*
- ■ *Nuclear Commitments Monitoring Committee*
- ■ *Corporate Responsibility Committee*
- ▲ *Independance within the meaning of AFEP-MEDEF Code criteria*

* Composition of the Board on the filing date of this universal registration document
** Excluding Directors elected by the employees

4.2.1 Members of the Board of Directors

In accordance with Order no. 2014-948 of 20 August 2014 regarding governance and trading in French State-owned companies, EDF is now administered by a Board of Directors consisting of three to eighteen members, including members appointed by the Shareholders' Meeting, others appointed upon recommendation from the French State in accordance with Article 6 of the Order, a French State Representative chosen by the Minister for the Economy from the civil service in accordance with Article 4 of the Order, and one third employee representatives elected in accordance with the provisions of the law of 26 July 1983 [(1)].

On the date of filing of this Universal Registration Document, the Board of Directors has eighteen members:

- eleven directors appointed by the Shareholders' Meeting, including five on recommendation from the French State;
- six directors elected by the employees;
- one Representative of the French State.

The Government Commissioner [(2)] and Head of the French State General Economic & Financial Supervisory Mission to the Company [(3)] and the Secretary of the Central Social & Economic Committee attend the meetings of the Board of Directors, but are not entitled to vote.

Between 1 January 2020 and the date of filing of this Universal Registration Document, there has been no change to the membership of the Board of Directors.

The Shareholders' Meeting convened on 7 May 2020 resolved to extend the term of office as Director of Ms Claire Pedini, for a period of three years ending following the Shareholders' Meeting called to approve the financial statements for the fiscal year ending 31 December 2022. This 3-year term was set by way of exception to the statutory 4-year term of office for directors, in order to maintain the staggered renewal of the Board of Directors implemented since 2019 (see section 4.2.2.1 "Term of office of Directors – Staggered re-election of the Board of Directors").

The Shareholders' Meeting also ratified the co-optings approved by the Board on 28 June and 18 December 2019 respectively, of François Delattre, to replace Maurice Gourdault-Montagne for the latter's remaining term of office, *i.e.* until the Shareholders' Meeting called to approve the financial statements for the fiscal year ending 31 December 2020, and Véronique Bédague-Hamilius, to replace Anne Rigail, whose resignation took effect on 16 December 2019, for the remainder of the latter's term of office, *i.e.* until the General Meeting called to approve the financial statements for the fiscal year ending 31 December 2022.

The terms of office of Marie-Christine Lepetit, Colette Lewiner, Laurence Parisot, Michèle Rousseau and François Delattre will expire at the General Meeting of Shareholders called to approve the financial statements for the year ending 31 December 2020. On recommendation from the Board of Directors, after receiving the opinion of the Appointments, Remuneration and Governance Committee, the General Meeting convened on 6 May 2021 will therefore be called to vote on the appointment and/or renewal of Directors.

Diversity policy

Feminisation of the Board of Directors and governing bodies

In accordance with Articles L. 225-18-1 and L. 22-10-3 of the French Commercial Code and the Order of 20 August 2014, EDF is subject to the regulations relating to the balanced representation of women and men on Boards of Directors and Supervisory Boards and the Company must comply with a proportion of no less than 40% of Directors of each gender on the Board, excluding directors representing employees. On the date of filing of this Universal Registration Document, EDF's Board of Directors includes eight women, including two of the directors elected by employees. Women thus make up 50% of the Board members taken into consideration to calculate this percentage (i.e. excluding directors representing employees), and 44.44% of the Board members as a whole.

Moreover, in accordance with the recommendations of the AFEP-MEDEF Code, during its meeting held on 16 December 2020, the Board of Directors approved a policy of gender balance for the management bodies applicable to the Company, hence enabling the goals of the Group's Ambition Mixité plan adopted by the Executive Committee on 18 November 2019 to be implemented within EDF and providing for several commitments aimed at removing the "glass ceiling" for women executives in terms of membership of Executive Committees and senior management positions. Within the scope of the Company, the objectives set by the Board are as follows:

- 30% of women on the Management Committees by 2023;
- 30% of women executives and future executives by 2025.

To meet these objectives, EDF's Executive Management shall adapt the objectives to the proportion of women executives in each of the Company's divisions and will pursue the action plans undertaken to:

- hire women executives at a higher rate than their proportion recorded in engineering schools;
- offer succession plans for each management position that would always include male and female candidates;
- carry out an annual "women's people review" for managers and future managers.

In addition, EDF shall promote the participation and visibility of women in public interventions in all areas of the Group's activities.

The Board of Directors shall annually review the results obtained together with the assessment of the policy of professional equality between women and men.

With regard to the results in terms of gender diversity in the 10% functions with highest responsibility (Article L. 22-10-10 of the French Commercial Code), women accounted for 28.1% [(4)] of the Company's 10% most senior positions as at 31 December 2019, compared with 27.5% as at 31 December 2018 (see section 3.3.3.1 "Workplace equality").

(1) The employee representatives mentioned in Paragraph I of Article 7 of the Order of 20 August 2014 are subject, for their election and their status, to the same provisions as those applicable to employee representatives of companies subject to the law of 26 July 1983 (chapters II and III of section II of the law).

(2) Article 15 of the Order of 20 August 2014.

(3) This remit exercises the French State's economic and financial supervision of EDF, in accordance with Article 8 of Decree no. 55-733 of 26 May 1955. It can exercise extensive supervisory procedures.

(4) The data as at 31 December 2020 are not available on the date of filing this Universal Registration Document.

Other diversity criteria

In accordance with the AFEP-MEDEF Code recommendations and Article L. 22-10-10 of the French Commercial Code, the Board of Directors periodically reviews the desirable balance in its membership and that of the Committees it creates, particularly in terms of the percentage of independent directors and diversity. It defines a diversity policy applied to members of the Board as with respect to criteria such as age, gender or professional qualifications and experience.

Based on the opinion of the Committee in charge of governance issues, the Board of Directors' meeting of 14 February 2019 had defined a diversity policy and objectives that take into account the Group's strategy, so that the membership of the Board encourages its deployment. In order to achieve a good balance in its membership, in connection with the Group's strategy and the remits entrusted to it, the Board considered that priority should be given to the search for skills and experience that suit its challenges and a complementarity of profiles.

This policy was reviewed and updated by the Board of Directors at its meeting held on 17 February 2021, in the context of the expiry of the terms of office of five directors at the end of the Shareholders' Meeting to be called on 6 May 2021 and taking into account the expectations expressed by the directors during the 2020 independent review of the Board of Directors (see section 4.2.2.5 "Evaluation of the functioning of the Board of Directors and its Committees").

The table below presents the criteria defined by the Board relating to the Diversity Policy:

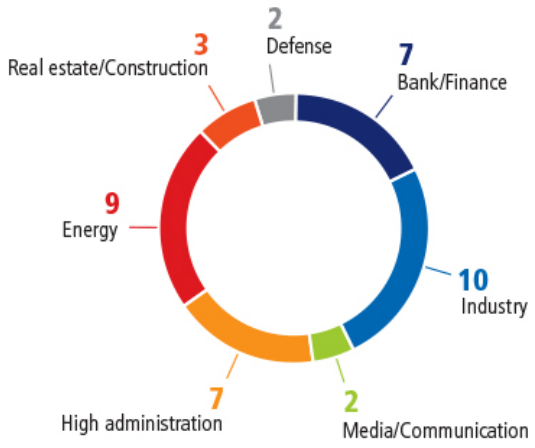
Criteria	Company's situation	Objectives
Age of directors	The directors appointed by the General Meeting are between 55 and 75 years old, with an average age of 62. The average age is 59.9 years for the Board as a whole.	The Board took the view that the age of the candidates is not a determining factor in the choice of candidates for the position of director and that the current average age is satisfactory, while remaining mindful of the threshold of one-third of directors over the age of 70*.
Gender parity	The Board includes 50% women, excluding employee directors, and 44.44% women on the Board as a whole.	The Board deemed that the current rate of women on the Board is satisfactory, without excluding the possibility of changing this rate, upwards or downwards, in the event of changes in the composition of the Board, in compliance with the legal thresholds.
Professional experience and complementarity nature of the profiles	The Board brings together a variety of profiles and skills (see below the tables presenting the skills of the members of the Board).	The Board has noted that the directors have significant experience in areas of expertise related to EDF's activities and strategy, which is likely to favour their deployment, and that their profiles complement each other satisfactorily. The Board will examine, during future appointments of directors, the possibility of further strengthening the Board's skills in the areas of general management of large companies and the energy sector, as suggested by the directors during the external review conducted in 2020.
Nationality	The Board of Directors does not include any directors of foreign nationality, but has to date a significant proportion of members with international experience.	The Board will consider, in future appointments of directors, the possibility of strengthening the Board's international expertise, as suggested by the directors in the external review conducted in 2020.
Independence	The Board has 5 independent directors, *i.e.* 41.7% of the 12 directors taken into account to establish this calculation (excluding directors representing employees).	The Board considered that the proportion of independent directors on the Board, which is higher than the recommendations of the AFEP-MEDEF Code, is satisfactory. The Board confirmed the objective of maintaining this proportion and at least respecting the objective of one-third of independent directors recommended by the AFEP-MEDEF Code for companies with a controlling shareholder.

* *Article L. 225-19 of the French Commercial Code stipulates that in the absence of an express provision in the articles of association concerning an age limit applicable to directors, the number of directors over the age of 70 May not exceed one-third.*

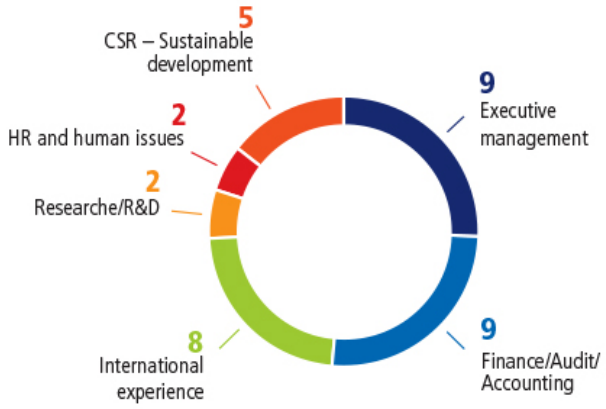
Business skills of the members of the Board of Directors

The tables below present the mapping of the business skills in specific sectors or functions of all members of the Board of Directors as at 31 December 2020:

Sector expertise by type of skill



Functional expertise by type of skill



Information regarding the directors

The table below summarises the main information concerning members of the Board of Directors as at the date of filing of this Universal Registration Document.

SUMMARY PRESENTATION OF THE BOARD OF DIRECTORS

	PERSONAL INFORMATION				EXPERIENCE	ROLE WITHIN THE BOARD				ATTENDANCE TO COMMITTEES						
	Age	Gender	Nationality	Number of shares	Number of mandates in listed companies (incl. EDF)	Independance	Date of first appointment	Term of office shall expire on	Seniority in the Board (in years)	Audit Committee	Strategy Committee	Appointments, Remuneration and Governance Committee	Nuclear Commitments Monitoring Committee	Corporate responsibility Committee
DIRECTORS APPOINTED BY THE SHAREHOLDERS' MEETING														
Jean-Bernard Lévy *Chairman and Chief Executive Officer*	65	M	French	0	4		23/11/2014	March 2023	6,15		P			
Bruno Crémel	55	M	French	0	1	▲	16/05/2019	AG 2023 (1)	1,67	■				
Colette Lewiner	75	F	French	1,969	4	▲	11/04/2014	AG 2021 (2)	6,76	■		P	■	
Laurence Parisot	61	F	French	137	1	▲	23/11/2014	AG 2021	6,15		■			■
Claire Pedini	55	F	French	0	1	▲	12/05/2016	AG 2023 (1)	4,68			■		P
Philippe Petitcolin	68	M	French	10	3	▲	16/05/2019	AG 2023	1,67	■	■			
DIRECTORS APPOINTED BY THE SHAREHOLDERS' MEETING ON RECOMMENDATION FROM THE FRENCH STATE														
Véronique Bédague-Hamilius	57	F	French	0	1		18/12/2019	AG 2023	1,08					■
François Delattre	57	M	French	0	1		28/06/2019	AG 2021	1,55		■			
Gilles Denoyel	66	M	French	0	2		16/05/2019	AG 2023	1,67				P	
Marie-Christine Lepetit	59	F	French	0	1		07/05/2012	AG 2021	8,69	P			■	
Michèle Rousseau	63	F	French	0	1		30/09/2016	AG 2021	4,29				■	
DIRECTOR REPRESENTING THE FRENCH STATE														
Martin Vial	67	M	French	0	3		9/09/2015	20/11/2022	5,35		■	■		
DIRECTORS APPOINTED BY THE EMPLOYEES														
Claire Bordenave	58	F	French	0	1		23/11/2019	22/11/2023	1,15					■
Jacky Chorin	61	M	French	316	1		23/11/2014	22/11/2023	6,15	■	■			■
Karine Granger	53	F	French	25	1		23/11/2019	22/11/2023	1,15		■	■	■	
Jean-Paul Rignac	58	M	French	0	1		01/11/2007	22/11/2023	13,21	■				
Vincent Rodet	55	M	French	2,905	1		23/11/2019	22/11/2023	1,15	■	■		■	■
Christian Taxil	45	M	French	1,360	1		23/11/2014	22/11/2023	6,15	■	■			

(1) AG 2023: Shareholders' Meeting called to approve the financial statements for the 2022 fiscal year.
(2) AG 2021: Shareholders' Meeting called to approve the financial statements for the 2020 fiscal year

■ Member of the Committee
P Chair of the Committee
▲ Independent administrator as per AFEP-MEDEF Code

Personal information on directors as well as information on their terms of office are shown in the table below and are provided as at 15 January 2021, unless otherwise stated.

DIRECTORS APPOINTED BY THE GENERAL SHAREHOLDERS' MEETING

Jean-Bernard LÉVY, 65 years old

Position held within the Company

Chairman and Chief Executive Officer since 27 November 2014 (1)

Date of appointment to the Board

23 November 2014

Last re-elected

16 May 2019 (2)

Expiry of current term of office

March 2023

Other position(s)

Chairman of the Strategy Committee

Shares held

0

Nationality

French

A former student of the École Polytechnique (graduating in 1973) and Telecom Paris Tech, Jean-Bernard Lévy began his career with France Télécom in 1979 as a works engineer at the Angers Division. In 1982, he became responsible for managing executive managers and HR budgets at the head office, then assistant to the Head of HR. In 1986, he was appointed Technical Advisor to the office of Gérard Longuet, Minister for Postal Services and Telecommunications. From 1988 to 1993, Jean-Bernard Lévy managed the telecommunications satellite activity of Matra Espace, now Matra Marconi Space. From 1993 to 1994, he ran the office of Gérard Longuet, Minister for Industry, Postal Services and Communications and Foreign Trade. In 1995, he was appointed Chairman & Chief Executive Officer of Matra Communication. In 1998, he joined Oddo & Cie as Chief Executive Officer then Managing Partner. In summer 2002, Jean-Bernard Lévy joined Vivendi. He served as its Chief Executive Officer until April 2005 and became Chairman of its Executive Board in April 2005, until June 2012. From December 2012 to November 2014, he was Chairman & Chief Executive Officer of the Thales defence and aerospace group. Jean-Bernard Lévy has been EDF's Chairman & Chief Executive Officer since 27 November 2014.

Other offices and positions held

Position held within the Company

- Chairman & Chief Executive Officer of EDF

Office/Position	Title	Country	
Chairman & Chief Executive Officer	EDF	France	L
Director	Edison	Italy	G/L
Director	EDF Energy Holdings	UK	G
Director	EDF Renewables	France	G
Chairman of the Board of Directors	EDF Foundation	France	G
Director	Dalkia	France	G
Chairman of the Supervisory Board	Framatome	France	G
Director(3)	Société Générale	France	L
Director and Chair of the Governance, Appointments and Sustainable Development Committee(4)	Faurecia	France	L
Chairman and Director as the representative of Électricité de France	Conseil français de l'énergie (*i.e.* French Energy Council)	France	
Director	France Industrie	France	
Chairman	FIPA – Fondation innovations pour les apprentissages (*i.e.* Innovative Apprenticeship Foundation)	France	
Director	Global Sustainable Electricity Partnership	Canada	
Member, Representative of EDF	Haut Comité pour la transparence et l'information sur la sécurité nucléaire (*i.e.* French High Committee for Transparency and Information on Nuclear Safety)	France	
Director	Cercle de l'industrie	France	

Expired offices held outside the Company over the past five years

In France

- Chairman of the Board of Directors of Institut Mines Télécom (formerly Institut Télécom)
- Director of the Institut Pasteur

Other countries

- Chairman of the Board of Directors of Edison
- Deputy Chairman of the Board of Directors of Eurelectric
- Chairman of the Board of Directors of EDF Energy Holdings

(1) Jean-Bernard Lévy was appointed temporary Chairman and Chief Executive Officer effective 23 November 2014, by ministerial decision of 21 November 2014.

(2) Jean-Bernard Lévy was appointed EDF's temporary Chairman & Chief Executive Officer effective 16 May 2019, by ministerial decision of 16 May 2019. He was appointed as the Company's Chairman & Chief Executive Officer by decree of the President of the Republic of France of 22 May 2019.

(3) Jean-Bernard Lévy's term of office as a director of Société Générale will expire at the Company's General Meeting to be held on 18 May 2021.

(4) Since 19 February 2021.

G: EDF group company – L: listed company.

VERONIQUE BEDAGUE-HAMILIUS, 57 years old

Position held within the Company

Director appointed by the Shareholders' Meeting on recommendation from the French State

Date of appointment to the Board

18 December 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Corporate Responsibility Committee

Shares held

0

Nationality

French

A graduate from the Paris Institute of Political Studies (IEP), ESSEC business school and a former student at the French National School of Administration (ENA), Véronique Bédague-Hamilius has been Deputy Chief Executive Officer of the Nexity group, in charge of the "Enterprises and Local Authorities Client" Division since 2019. She has also been Chair & Chief Executive Officer of Nexity Immobilier d'Entreprise since March 2018. She joined Nexity group in 2017 as General Secretary and member of the Executive Committee. Before joining the Nexity group, Véronique Bédague-Hamilius had a career as a senior civil servant. She has been an economist at the International Monetary Fund in Washington between 1994 and 1997, an advisor to the French Minister for the Economy, Finance and Industry, Laurent Fabius, from 2000 to 2002, CFO of the City of Paris from 2002 to 2007, General Secretary of the City of Paris under Bertrand Delanoë from 2008 to 2014 and Chief of Staff to the Prime Minister, Manuel Valls, from 2014 to 2016.

Other offices and positions held

Principal position held outside the Company

- Deputy Chief Executive Officer of the Nexity group, in charge of the "Enterprises and Local Authorities Client" Division
- Chair & Chief Executive Officer of Nexity Immobilier d'Entreprise

Office/Position [1]	Title	Country
Deputy Chief Executive Officer	Nexity	France
Chair & Chief Executive Officer	Nexity Immobilier d'Entreprise	France
Chair of the Board of Directors	Nexity Property Management	France
Deputy Chief Executive Officer	Villes et Projets	France
Member of the Strategy Committee	Bureaux à partager	France
Chief Executive Officer	SIG 30 Participations	France

Expired offices held outside the Company over the past five years

In France

- Chief Executive Officer of Nexity Property Management
- Director of the Nexity Corporate Foundation
- Chairman of Neximmo 78

(1) Ms Bédague-Hamilius also holds various offices within the Nexity group as legal representative of Nexity group entities. She is the legal representative of Nexity Immobilier d'Entreprise at SAS Ywood, SNC FI Développement, SCCV Lesquin Buro and SAS Tereneo, and the legal representative of Villes et Projets in the SNC Amenagement Charras company.

BRUNO CREMEL, 55 years old

Position held within the Company

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Audit Committee

Shares held

0

Nationality

French

A graduate of the École centrale de Paris, the Paris Institute of Political Studies (IEP), and the French National School of Administration (ENA – General Finance Inspection), Bruno Crémel started his career as a Finance Inspector, before joining the French Ministry for the Economy, Finance, and Industry as head of the Public Banks and Insurance Office, State Participations Department, where he notably coordinated the privatisation of several public banks and insurance companies. From 1998 to 2000, he was Strategic Planning Director at the Kering group as a member of the Executive Committee, then Chairman of the Management Board of PPR Interactive. From 2000 to 2002, he was Chief of Staff of Laurent Fabius, Minister for the Economy, Finance and Industry. From 2002 to 2006, Bruno Crémel was Chief Executive Officer of FNAC. From 2006 to 2012, he was General Partner and member of the Executive Committee of the LBO France investment fund, where he notably oversaw the acquisitions of Maisons du Monde and Promovacances. He was appointed Chairman & Chief Executive Officer of Darty France in 2012. He joined the Partech investment fund in May 2014 as a General Partner and Deputy Chief Executive Officer since May 2016.

Other offices and positions held

Principal position held outside the Company

- General Partner and Deputy Chief Executive Officer of Partech Partners

Office/Position	Title	Country
Deputy Chief Executive Officer	Partech Partners	France
Chairman	Partech Growth GP	France
Chairman of the Board of Directors	Artaris	France
Director	Evaneos	France
Member of the Strategy Committee	Rouje	France
Director	Sendinblue	France
Director	Made.com	United Kingdom
Director	M-Files	Finland
Member of the Supervisory Board	Exporo	Germany

Expired offices held outside the Company over the past five years

In France

- Director of EcoVadis
- Director of NA-KD

François DELATTRE, 57 years old

Position held within the Company

Director appointed by the Shareholders' Meeting on recommendation from the French State

Date of appointment to the Board

28 June 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2020

Other position(s)

Member of the Strategy Committee

Shares held

0

Nationality

French

A graduate from the Paris Institute of Political Studies (IEP) and the National School of Administration (ENA), François Delattre began his career in 1989 as Second Secretary at the French Embassy in Germany. After spending two years at the Strategic Affairs & Disarmament Department of the French Ministry for Foreign Affairs from 1991 to 1993, he became a Special Advisor in Defence and European & Transatlantic Security in the office of the Minister of Foreign Affairs, Alain Juppé in 1993, before being in charge of these issues within the diplomatic team of the President of the French Republic, Jacques Chirac from 1995 to 1998. He was appointed Head of the Press and Communication Service at the French Embassy in Washington in 1998, Deputy Chief of Staff to the Minister of Foreign Affairs, Dominique de Villepin in 2002 and then Consul General in New York in 2004. French Ambassador to Canada from 2008 to 2011, and to the United States from 2011 to 2014, he was appointed Permanent Representative of France to the United Nations in September 2014. He has been General Secretary of the French Ministry of Europe & Foreign Affairs since 1 July 2019.

Other offices and positions held

Principal position held outside the Company

- Secretary General of the French Ministry for Europe & Foreign Affairs

Office/Position	Title	Country
Director	Orano	France
Director	Agence nationale des titres sécurisés (*i.e.* French national agency of secure shares)	France
Director	Commission de récolement des dépôts d'œuvres d'art (*i.e.* French commission for the verification of the registration of works of art)	France
Director	National School of Administration (ENA)	France
Director	France Médias Monde	France
Director	Institut français	France
Director	Office français de protection des réfugiés et apatrides (*i.e.* French Office for the Protection of Refugees and Stateless Persons)	France
Director	Sorbonne Abou Dhabi	France
Director	Institut des hautes études de defense nationale (*i.e.* French high National Defence Study Institute)	France

Expired offices held outside the Company over the past five years

In France

- None

GILLES DENOYEL, 66 years old

Position held within the Company

Director appointed by the Shareholders' Meeting on recommendation from the French State

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Chairman of the Nuclear Commitments Monitoring Committee

Shares held

0

Nationality

French

A graduate as a General Engineer from Mines ParisTech Engineering School, former student at the Paris Institute of Political Studies (IEP) and the National School of Administration (ENA), Gilles Denoyel was appointed as a Finance Inspector at the Ministry for the Economy & Finance in 1981 before joining the Treasury Department in 1985, where he was successively in charge of the CIRI (Interministerial Committee for Industrial Restructuring), the Financial Markets Bureau, the Insurance Sub-Directorate and, ultimately, the privatisation programme. In 1996, he joined the CCF group as Chief Financial Officer, then General Secretary in charge of Strategy and Operations, then Senior Executive Vice-President in charge of Finance: in this capacity, he played a significant part in the integration of CCF into the HSBC group. In 2004, he was appointed Director Deputy Chief Executive Officer, successively in charge of central functions, asset management and insurance, and then of all risk and control functions and relations with regulatory authorities. From 2015 to 2017, he was HSBC's International Institutional Relations President for Europe. He was also Chairman of the Group of banks under foreign control in France from 2006 to 2016 and Treasurer of the Association Française des Banques (*i.e.* French banking association) from 2004 to 2016. Gilles Denoyel has been Chairman of the Board of Directors of Dexia and Dexia Crédit Local since May 2018.

Other offices and positions held

Principal position held outside the Company

- Chairman of the Board of Directors of Dexia and Dexia Crédit Local

Office/Position	Title	Country	
Chairman of the Board of Directors	Dexia	Belgium	
Chairman of the Board of Directors	Dexia Crédit Local	France	
Member of the Supervisory Board	Memo Bank	France	
Member of the Supervisory Board	Rothschild & Co	France	L

Expired offices held outside the Company over the past five years

In France

- Director of HSBC France

G: EDF group company - L: listed company.

Marie-Christine LEPETIT, 59 years old

Position held within the Company

Director appointed by the Shareholders' Meeting on recommendation from the French State

Date of appointment to the Board

7 May 2012

Last re-elected

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2020

Other position(s)

Chair of the Audit Committee and member of the Nuclear Commitments Monitoring Committee

Shares held

0

Nationality

French

A former student of the École Polytechnique and the National School of Administration (ENA), Marie-Christine Lepetit joined the Inspectorate General of Finance in 1987, where she held auditing and advisory positions. In 1991, she was recruited by Jean Lemierre to the Directorate General for Tax in order to introduce management control. In 1995, she was in charge of synthesis work at the tax law department before joining the office of the Prime Minister, Alain Juppé, as technical advisor in tax matters and macroeconomic studies then taxation and SMEs from 1995 to 1997. She continued her career at the General Directorate for Tax, working to improve service quality (pre-filled tax returns, remote procedures, and certification). She was appointed Director of Tax Law at the Ministry for the Economy and Finance in 2004 and used this role to push through tax reforms from 2004 to 2012. At the same time, she co-chaired the working group on reform of the financing of social welfare in 2006 and co-signed the report by the conference of experts on the "energy-climate contribution" chaired by Michel Rocard. She also sat on the Local Authorities Reform Committee chaired by Edouard Balladur as Executive Director and was a member of the Public Life Renewal and Ethics Commission chaired by Lionel Jospin. She has been Head of the Inspectorate General of Finance since March 2012, and now reports to the Minister for the Economy, Finance and Recovery.

Other offices and positions held

Principal position held outside the Company

- Head of the Inspectorate General of Finance at the Ministry for the Economy, Finance and Recovery

Office/Position	Title	Country
Member of the Risks & Internal Control Committee	Fondation des apprentis d'Auteuil (*i.e.*: Auteuil Apprenticeship Foundation)	France
Director	Paris Institute of Political Studies (IEP)	France

Expired offices held outside the Company over the past five years

In France

- Director of the Fondation nationale des sciences politiques (FNSP) (*i.e.* the French National Foundation of Political Science)

Colette LEWINER, 75 years old

Position held within the Company

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

11 April 2014

Last re-elected

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2020

Other position(s)

Chair of the Appointments, Remuneration & Governance Committee, member of the Audit Committee and the Nuclear Commitments Monitoring Committee

Shares held

1,969 (1)

Nationality

French

A former student of the École normale supérieure and holder of an Agrégation degree in physics and Doctorate in science, Colette Lewiner joined Électricité de France in 1979. In 1989 she created the Development and Commercial Strategy Division, accordingly becoming the first woman appointed Executive Officer at EDF. From 1992 to 1998, she was Chair & Chief Executive Officer of SGN, a nuclear engineering company, subsidiary of AREVA-Orano. In 1998, she joined Capgemini to create then manage until June 2012 the Global Energy and Utilities sector. Since July 2012, she has been, as Manager of Cowin, a Consultant in the energy field. Non-executive Chair of TDF (SAS) from 2010 to 2015, she has been a member of the Académie des Technologies (*i.e.* French National Academy of Technologies) since 2002. She is a Director of the Bouygues group as well as Getlink and CGG.

Other offices and positions held

Principal position held outside the Company

- Professional Director

Office/Position	Title	Country	
Director	Bouygues	France	L
Director	Getlink (formerly Eurotunnel)	France	L
Director	CGG	France	L

Expired offices held outside the Company over the past five years

In France

- Director of Ingenico
- Director of Nexans

Other countries

- Director of Crompton Greaves (India)

(1) Shares held directly and through the profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).
G: EDF group company – L: listed company.

Laurence PARISOT, 61 years old

Position held within the Company

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

23 November 2014

Last re-elected

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2020

Other position(s)

Member of the Strategy Committee and member of the Corporate Responsibility Committee

Shares held

137

Nationality

French

Holder of a Master's degree in Public Law from Université Nancy II, graduate from the Paris Institute of Political Studies (IEP) and holder of an MAS in Political Studies from the IEP, Laurence Parisot joined in 1985, as survey manager, the Louis Harris Survey Institute. She became Chief Executive Officer in 1986. In 1990, she was appointed Chair & Chief Executive Officer of the IFOP (*i.e.* French Institute of Public Opinion), in which she gradually acquired the majority of the capital. Having sold IFOP, she led the Cabinet Gradiva for a short period, and was then appointed Chair and Managing Director of Citi bank France in 2018. Laurence Parisot was Chair of MEDEF (*i.e.* the French Business Confederation) from 2005 to 2013. She is also a Director of Fives and Paris Europlace, and a member of the Board of Directors of the Fondation nationale des sciences politiques (FNSP) (*i.e.* the French National Foundation of Political Science).

Other offices and positions held

Principal position held outside the Company

- Chair and Managing Director of Citi bank France

Office/Position	Title	Country
Director	Paris Europlace	France
Director	Fives	France
Director	Fondation nationale des sciences politiques (FNSP) (*i.e.* the French National Foundation of Political Science)	France

Expired offices held outside the Company over the past five years

In France

- Manager and Associate Director of Gradiva
- Deputy Chair of the Executive Board of the IFOP group
- Chair of the Scientific Committee of Fondapol
- Director of BNP Paribas
- Director of Foxintelligence

Claire PEDINI, 55 years old

Position held within the Company

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

12 May 2016

Date of re-election

7 May 2020

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Chair of the Corporate Responsibility Committee and member of the Appointments, Remuneration & Governance Committee

Shares held

0

Nationality

French

Claire Pedini is a graduate of the HEC business school and holds a Master's degree in Media Management from the ESC Paris business school. In 1988, she joined Total as Corporate Controller. She assumed responsibility for Total's admission to trading on the New York Stock Exchange in 1991, and became Head of the Financial Communication of the company in 1992, Executive manager of the Media Relations in 1994 and Head of New Information Technologies department in 1997. In 1998, she joined Alcatel as Chief of Financial communication, becoming successively Head of the Financial communication and institutional relations in 2001, Deputy Chief Financial Officer in 2004, Executive manager of Human Resources and Corporate Communications and member of the Executive Committee in 2006, Head of Human Resources, Corporate Communications and Real Estate in 2007, and Executive Vice-President of Human Resources and Transformation, of Alcatel-Lucent in 2009. Claire Pedini was a Director of Arkema from 2010 to 2016. She joined the Saint Gobain group in June 2010 as Senior Vice-President in charge of Human Resources. She has been Senior Vice-President, Human Resources and Digital Transformation since January 2019.

Other offices and positions held

Principal position held outside the Company

- Senior Vice-President Human Resources and Digital Transformation for the Saint-Gobain Group – Member of the Executive Committee of Saint-Gobain

Office/Position	Title	Country
None		

Expired offices held outside the Company over the past five years

In France

- Director of Arkema

PHILIPPE PETITCOLIN, 68 years old

Position held within the Company

Director appointed by the Shareholders' Meeting

Date of appointment to the Board

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2022

Other position(s)

Member of the Strategy Committee and Member of the Audit Committee

Shares held

10

Nationality

French

A graduate in Mathematics and graduate of the CPA Paris business school, Philippe Petitcolin began his career as Export Manager for Europrim, then became Export Zone Manager for the Alcatel-Alstom subsidiary, Filotex. In 1982, he was appointed Aeronautical Sales Manager for Chester Cable in the United States. He returned to Filotex as Export Manager in 1984. In 1988, he joined Labinal as Deputy Sales Manager before being appointed Sales and Marketing Manager of the Aeronautical Systems Division, where he became General Manager in 1995. From 1999 to 2001, he became Head of Labinal's Filtrauto Division, which he combined with the roles of Chief Executive Offices and Head of Friction Materials following the takeover of Filtrauto by Valeo. In May 2001, he took on the position of Chief Executive Officer of Labinal (now Safran Electrical & Power), and became Chairman & Chief Executive Officer in November 2004. In 2006, he was appointed Chairman & Chief Executive Officer of Snecma (now Safran Aircraft Engines). From 2011 to 2013, he was appointed Chairman & Chief Executive Officer of Safran's defence and security activities as well as Chairman & Chief Executive Officer of Safran Electronics & Defense. From July 2013 to July 2015, he was Chairman & Chief Executive Officer of Safran Identity & Security. He was appointed Director and Chief Executive Officer of Safran in April 2015, up until 31 December 2020. On the same date, he became a member of the Board of the "Aerospace & Defence Industries Association of Europe" (ASD). He has been Vice-Chairman of GIFAS (Grouping of French aeronautics and space companies) and a Director of Belcan Corporation since 2015, a Director of Pernod Ricard since 2019, a Director of Suez since 1 February 2021 and Chairman of the Board of Directors of KNDS since 1 March 2021.

Other offices and positions held

Principal position held outside the Company

- Corporate director

Office/Position	Title	Country	
Chairman of the Board of Directors [1]	KNDS	The Netherlands	
Director [2]	Suez	France	L
Director	Pernod Ricard	France	L
Director	Belcan Corporation	United States	

Expired offices held outside the Company over the past five years

In France

- Director and Chief Executive Officer of Safran

(1) Since 1 March 2021.

(2) Since 1 February 2021.
G: EDF group company – L: listed company.

Michèle ROUSSEAU, 63 years old

Position held within the Company

Director appointed by the Shareholders' Meeting on recommendation from the French State

Date of appointment to the Board

30 September 2016

Last re-elected

16 May 2019

Expiry of current term of office

Shareholders' Meeting called to approve the financial statements for the fiscal year closing 31 December 2020

Other position(s)

Member of the Nuclear Commitments Monitoring Committee

Shares held

0

Nationality

French

Michèle Rousseau graduated as a General Engineer from Mines ParisTech Engineering School. She began her career at the Nord-Pas de Calais DRIRE (*i.e.* Regional Directory for Industry, Research and the Environment) as Head of the Environment Division. She went on to join the Ministry of the Environment where she was responsible for waste, and later the Ministry of Industry where she held the post of Deputy Head of the Nuclear Installation Safety Directorate with responsibility for oversight of EDF's nuclear fleet. She then moved to the ANVAR (*i.e.* French research and innovation agency), as Deputy General Manager where she conducted policies supporting innovative projects driven by SMEs, and later moved to the French Ministry of Economy, Finance and Industry as Head of the demand and energy markets department. Here, she was tasked in particular with developing a new legislative and regulatory framework in the wake of the opening up of European electricity and gas markets and expanding energy conservation and renewable energies. Michèle Rousseau subsequently returned to the Ministry of Ecology and Sustainable Development, where she held the positions of Secretary General and, in 2008, General manager, Deputy Commissioner General for Sustainable Development, with particular responsibility for implementing the Grenelle Environment initiative. In 2011, she was appointed General manager of the Seine-Normandie Water Agency before returning in 2016 to the General Council for Environment and Sustainable Development where she was Chair of the Haut-de-France Regional Environmental Authority (MRAe). Michèle Rousseau has been the Chair of the Bureau de recherches géologiques et minières (*i.e.* French Geological Survey institution) since March 2017, and Director of the ANR (*i.e.* French national agency for investigation) since 2019.

Other offices and positions held

Principal positions held outside the Company

- Chair of the Board of Directors of the Bureau de recherches géologiques et minières – BRGM

Office/Position	Title	Country
Chair of the Board of Directors	Bureau de recherches geologiques et minieres – BRGM	France
Director	Agence nationale de la recherche (ANR)	France

Expired offices held outside the Company over the past five years

In France

- Chair of the Hauts-de-France Regional Environmental Authority (MRAe) on the French General Council for the Environment & Sustainable Development
- Director of the Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture (IRSTEA)

DIRECTOR – REPRESENTATIVE OF THE FRENCH STATE

Martin VIAL, 67 years old

Position held within the Company

Director – Representative of the French State

Date of appointment to the Board

9 September 2015

Last re-elected

21 November 2018

Expiry of current term of office

20 November 2022

Other position(s)

Member of the Appointments, Remuneration & Governance Committee and the Strategy Committee

Shares held

0

Nationality

French

Graduate from the ESSEC business school and the École nationale supérieure des postes et télécommunications, Martin Vial began his career as Postal Services and Telecommunications Director at the Financial Division of the General Postal Directorate. In 1986, he joined the Treasury Division at the Ministry for the Economy and Finance. From 1988 to 1993, he was successively Technical Advisor, Deputy Manager then Head of the offices of the Minister for Postal Services and Telecommunications and Space, the Minister for Equipment, Housing, Transport and Space, and finally the Minister for Postal Services and Telecommunications. In 1993, Martin Vial was appointed Chairman & Chief Executive Officer of Aéropostale, airline and joint subsidiary of Air France, La Poste and TAT, and he was elected Chairman of the Chambre Syndicale du Transport Aérien [French air transport union] and Fédération nationale de l'aviation marchande [French national commercial aviation union]. At the end of 1997, he became Chief Executive Officer of La Poste group. In September 2002, he was appointed Chairman of La Poste group and at the same time Deputy Chairman of the Caisse Nationale de Prévoyance (CNP). Martin Vial joined the French National Audit Office in September 2002 as Chief Advisor. From 2003 to 2014, he was Chief Executive Officer of the Europ Assistance group, world leader on the groundhandling market and Director and Chief Executive Officer of Europ Assistance Holding. He also chairs several Boards of Directors of companies in the Europ Assistance group. In January 2015, he founded Premium Care, a company which provides assistance to the elderly. Commissioner of the French State Shareholdings since August 2015, Martin Vial is a Director of Renault, Bpifrance and Air France.

Other offices and positions held

Principal position held outside the Company

- Commissioner of the French State Shareholdings Agency

Office/Position	Title	Country	
Director	Renault	France	L
Director	Air France KLM	France	L
Director	Bpifrance	France	

Expired offices held outside the Company over the past five years

In France

- Director of Thales

Other countries

- None

G: EDF group company – L: listed company.

DIRECTORS ELECTED BY THE EMPLOYEES

Claire BORDENAVE, 58 years old

Position held within the Company

Director elected by the employees

Date of appointment to the Board

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Corporate Responsibility Committee

Shares held

0

Nationality

French

A graduate from ESSEC business school and holder of 2-year Master's degree from INSTN (*i.e.* French Institute for Nuclear Science and Technology), Claire Bordenave began her career in the electrical and gas industries at Gaz de France's Economic & Sales Directorate in 1988 as a business engineer. She was responsible for project development and negotiation in France and internationally, as well as strategic and economic studies. She is currently in charge of studies at the EDF group Strategy Division, and has been a member of the French Higher Energy Council since 2011 and of the Economic, Social and Environmental Council since 2018. Claire Bordenave is sponsored by the CGT trade union.

Other offices and positions held

Position held within the Company

- Senior Analyst at the EDF group Strategy Division

Office/Position	Title	Country
Council member	Conseil économique social et environnemental (*i.e.* French Economic, Social and Environmental Council)	France
Member	Conseil supérieur de l'énergie	France

Expired offices held outside the Company over the past five years

- Chair of the Île-de-France Regional Economic, Social & Environmental Council's Environment & Energy Transition Committee
- Director of the CNIEG

Jacky CHORIN, 61 years old

Position held within the Company

Director elected by the employees

Date of appointment to the Board

23 November 2014 [1]

Last re-elected

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Audit Committee, Strategy Committee, and Corporate Responsibility Committee

Shares held

316 [2]

Nationality

French

A graduate from the Institut d'études politiques (IEP) in Paris and a Doctor of Law, Jacky Chorin began his career at EDF as a legal specialist at the Corporate Office of the Equipment Division in 1983. He is currently the special advisor to the Human Resources Manager of the EDF Nuclear and Division. He was a member of the French National Ecological Transition Council from 2014 to 2016 and has been a member of the French Higher Energy Council since 2012. Jacky Chorin was a Director of EDF from September 2004 to November 2009, before being re-elected in 2014. He is sponsored by the Force Ouvrière (FO) trade union.

Other offices and positions held

Position held within the Company

- Special advisor to Human Resources Manager of EDF Nuclear & Thermal Fleet Division.

Office/Position	Title	Country
Member	Conseil supérieur de l'énergie	France

Expired offices held outside the Company over the past five years

In France

- Member of the Conseil national de la transition ecologique (*i.e.* French National Council for the Energy Transition)
- Member of the Conseil économique, social et environnemental (*i.e.* French Economic, Social & Environmental Council)

(1) Jacky Chorin was previously Director of EDF (EPIC then limited company) from September 2004 to November 2009.

(2) Shares held through the profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

KARINE GRANGER, 53 years old

Position held within the Company

Director elected by the employees

Date of appointment to the Board

23 November 2019

Expiry of current term of office

22 November 2023

Other position(s)

Member of the Nuclear Commitments Monitoring Committee, Appointments, Remuneration & Governance Committee, and Strategy Committee

Shares held

25

Nationality

French

A graduate from the Institut universitaire de technologie du Creusot, Karine Granger began her career in 1987 at the SAT SAGEM optronic and aeronautical laboratory, then continued to gain professional experience at GEC ALSTOM group before joining EDF in 1992 at the Thermal Engineering Centre. In 2004, she was assigned to EDISON to build a combined cycle gas turbine power plant in Calabria. Back in France, she was in charge of estimating the investment costs of the Hydraulic Engineering Centre. In this role, she set up and managed a network of estimators at the Engineering Production Division, all segments included. In 2014, she was appointed Chief Executive Officer of EDF Cameroon for a public-private partnership to develop a 420MW hydraulic project. She was appointed by the French Prime Minister as Advisor on Foreign Trade for France in Cameroon in 2016. Back in France, Karine Granger became Energy Advisor at FNME CGT in charge of industrial issues. In 2020, she also obtained the Company Director Certificate jointly issued by the IEP (*i.e.* French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). She is also a member of the Conseil supérieur de l'énergie, and of the Conseil économique social et environnemental (*i.e.* French economic, social and environmental council) for the Auvergne-Rhône-Alpes region. Karine Granger is sponsored by the CGT trade union.

Other offices and positions held

Position held within the Company

- EDF Hydro Operational Management Control project manager

Office/Position	Title	Country
Member	Conseil supérieur de l'énergie	France
Council member	CESER Auvergne-Rhône-Alpes	France

Expired offices held outside the Company over the past five years

- None

Jean-Paul RIGNAC, 58 years old

Position held within the Company
Director elected by the employees
Date of appointment to the Board
1 November 2007
Last re-elected
23 November 2019
Expiry of current term of office
22 November 2023
Other position(s)
Member of the Audit Committee
Shares held
0
Nationality
French

Holder of a doctorate in energy from the Institut national polytechnique in Toulouse, Jean-Paul Rignac joined EDF in 1991. He served as Secretary of EDF Research & Development's Joint Generation Committee for five years. He is a research engineer at EDF's Research & Development Division (Renardières Centre), and currently works on energy efficiency in the heating/air-conditioning/air quality of industrial buildings and clean rooms. Jean-Paul Rignac is sponsored by the CGT trade union.

Other offices and positions held

Position held within the Company

- Research Engineer at the EDF Research and Development Division

Office/Position	Title	Country
None		

Expired offices held outside the Company over the past five years

- None

VINCENT RODET, 55 years old

Position held within the Company
Director elected by the employees
Date of appointment to the Board
23 November 2019
Expiry of current term of office
22 November 2023
Other position(s)
Member of the Strategy Committee, Audit Committee, Nuclear Commitments Monitoring Committee, and Corporate Responsibility Committee
Shares held
2,905 (1)
Nationality
French

Holder of an advanced graduate diploma in organisational sociology from Université Lyon II, Vincent Rodet began his career in 1987 as an energy movement computer specialist (RTE), then joined the consultancy service in 1995, which then worked for both EDF and Gaz de France. From 2007 to 2014, he was EDF SA CFDT Central Trade Union Representative and EDF group CFDT coordinator. In this capacity, he was a member of the France Group Committee and the European Committee. From 2014 to 2018, he led the CFDT delegation, with responsibility for social dialogue within the Electrical and Gas Industries Division. As a member of the CSFN (*i.e.* French National Nuclear Industry Strategy Committee) in 2018, he contributed to work on reconsolidation of the nuclear industry and more broadly oversaw the Multi-year Energy Programme (programmation pluriannuelle de l'énergie – PPE) process for the CFDT trade union. In 2020, he also obtained the Company Director Certificate jointly issued by the IEP (*i.e.* French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). Vincent Rodet is sponsored by the CFDT trade union.

Other offices and positions held

Position held within the Company

- HR operator manager, Special duties at the Professionalisation & Industrial Performance Unit

Office/Position	Title	Country
Member	French National Nuclear Industry Strategy Committee (CSFN – Comité stratégique de la filière nucléaire)	France

Expired offices held outside the Company over the past five years

- None

(1) Shares held through the profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

CHRISTIAN TAXIL, 45 years old

Position held within the Company
Director elected by the employees
Date of appointment to the Board
23 November 2014
Last re-elected
23 November 2019
Expiry of current term of office
22 November 2023
Other position(s)
Member of the Audit Committee and Strategy Committee
Shares held
1,360 (1)
Nationality
French

Graduate from the ESCP Europe School, holding an Executive MBA diploma, and from the École des Mines in Douai, Christian Taxil began his career in 1999 at EDF Gaz de France Distribution in customer, local authority and concession management positions. From 2004 to 2008, he was in charge of electricity and gas industry social dialogue on the Fédération CFE-CGC Énergies union's management team. In 2008, he joined the EDF group Audit division before being elected, from June 2009 to September 2014, General Secretary of the Fédération CFE-CGC Énergies union. He is currently manager of Key Accounts at the Dalkia's Trading & Marketing Division. In 2018, he obtained the Company Director Certificate jointly issued by the IEP (*i.e.* French Institute of Political Studies) and the Institut français des administrateurs (French Institute of Directors). Christian Taxil is sponsored by the CFE-CGC trade union.

Other offices and positions held

Position held within the Company

- Manager of Key Accounts at the Dalkia's Trading & Marketing Division

Office/Position	Title	Country
None		

Expired offices held outside the Company over the past five years

In France

- Elected representative of the Office of the Syndicat mixte d'électricité, de gaz et de telecommunications du Val-d'Oise (SMDEGTVO)

(1) Shares held through the profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

4.2.2 Functioning of the Board of Directors

The internal Rules of Procedure of the Board of Directors www.edf.fr set the principles of its functionning and the terms and conditions according to which the Board and its Committees fulfil their duties. It defines the role and powers of the Chairman & Chief Executive Officer. These internal Rules of Procedure are regularly updated, particularly to take account of legislative and regulatory changes and changes to the AFEP-MEDEF Code (see section 4.1 "Corporate Governance Code").

4.2.2.1 Term of office of Directors – Staggered re-election of the Board

EDF's articles of association set the term of office of Directors to four years (see section 4.2.1 "Members of the Board of Directors").

In accordance with the provisions of Article 2 of decree no. 2014-949 of 20 August 2014 implementing the Order of 20 August 2014, the Representative of the French State is appointed for a term equal to the term of office of the members of the Board of Directors, *i.e.* for a four-year term.

Since 2019, the Board of Directors, excluding directors elected by employees and Representative of the French State appointed by decree, has been renewed by rotation, pursuant to Article 13 of EDF's articles of association, in such a way that half (rounded to the nearest whole number) of the directors elected by the Shareholder's Meeting be renewed every two years and that the Board be completely renewed, for the directors concerned, at the end of each four-year period. Pursuant to these provisions, the Shareholders' Meeting held on 7 May 2020 renewed Claire Pedini's term of office as a Director for a period of three years, by way of exception to the statutory 4-year term of office, in order to maintain the staggered renewal of the Board of Directors (see section 4.2.1 "Members of the Board of Directors").

The directors appointed by the Shareholders' Meeting can be dismissed at any time by an Ordinary Shareholders' Meeting. In accordance with Articles 12 and 25 of the Law on the Democratisation of the Public Sector, the directors elected by the employees can be individually dismissed for gross negligence in the exercise of their duties by order of the President of the Tribunal de Grande Instance [High Court] delivered at summary proceedings upon request from the majority of the members of the Board. However, in the event that serious dissent disrupts the management of the Company, dismissal pronounced by the Shareholders' Meeting can be extended to employee representatives. The Representative of the French State ceases his duties by resigning or if they lose the capacity by virtue of which they were appointed; they can be replaced at any time for the remainder of the term of office.

4.2.2.2 Method of exercising Executive Management – Appointment and powers of the Chairman & Chief Executive Officer

In accordance with the option provided for in Article 18 of the Order of 20 August 2014, EDF's articles of association state that the Chairman of the Board of Directors is the Executive Manager of the Company and holds the title of Chairman & Chief Executive Officer. The "non-separated" Executive Management structure is therefore set out in the Company's articles of association. The Board's internal Rules of Procedure, and in particular the limitations it applies to the powers of the Chief Executive Officer, ensure a satisfactory balance, in the Company's interest, between the Chairman & Chief Executive Officer and the Board of Directors, whilst preserving the flexibility, effectiveness and responsiveness necessary in the administration and management of the Company.

EDF's Chairman & Chief Executive Officer is appointed by decree of the President of the Republic of France, on recommendation from the Board of Directors. They can be dismissed by decree in accordance with Article 20 of the Order of 20 August 2014. In accordance with the provisions of Article 13 of the French Constitution, the Chairman is appointed based on the opinion of the Permanent Committees of the French National Assembly and Senate. At the end of this process, Jean-Bernard Lévy was re-elected as EDF's Chairman and CEO by decree of 22 May 2019.

In case of vacation of the office of Chairman & Chief Executive Officer, Article 21 of the Order of 20 August 2014 states that the French State can appoint someone to the role temporarily until the appointment of the new Chairman and CEO. In accordance with this provision, Jean-Bernard Lévy was appointed, by ministerial decision of 16 May 2019, temporary Chairman & Chief Executive Officer of the Company from 16 May 2019 until 22 May 2019.

Subject to the specific legal provisions governing public sector companies and the powers specifically reserved by law or by the articles of association to the Board of Directors or to Shareholders' Meetings, and the limits to the powers of the Chairman & Chief Executive Officer provided for by the internal Rules of Procedure of the Board of Directors as internal rules (see section 4.2.2.3 "Powers and duties of the Board of Directors" below), the Chairman & Chief Executive Officer is vested with the most extensive powers to act on behalf of the Company under all circumstances, within the limits of the corporate purpose. The Chairman & Chief Executive Officer organises and supervises the work of the Board of Directors and reports to the Shareholders' Meeting. They oversee the proper running of the Company's bodies and, in particular, ensure that the directors are in a position to fulfil their duties.

4.2.2.3 Powers and duties of the Board of Directors

The Board of Directors meets as often as the interest of the Company requires, in accordance with applicable legislative and regulatory provisions. In accordance with the Board's internal Rules of Procedure, the directors meet once a year to discuss the strategy of the Company and of the Group as part of an *ad hoc* seminar. Moreover, under the internal rules of the Board of Directors, a meeting is to be held each year without the attendance of the Chairman & Chief Executive Officer (executive session), and shall be chaired by the Chair of the Appointments, Remuneration & Governance Committee.

The Board of Directors determines the orientations of the Company's business and ensures their implementation, in accordance with its corporate interest, taking into consideration the corporate and environmental challenges of its activity and the Company's *raison d'être*, adopted in 2020 (see section 1 "The Group, its strategy and activities"), whose roll-out will be closely monitored. It defines the major strategic, economic, financial and technological objectives for the Company and the Group. Subject to powers expressly attributed to the Shareholders' Meetings and as limited by the Company's corporate purpose, the Board may consider any question relating to the proper running of the Company and acts, through its deliberations, on any such issue.

The Board deliberates, after examination by the competent Committee or Committees, as the case may be, on the annual budget, the medium-term plan, any significant operation falling outside the Company's announced strategy, the corporate strategic plan presenting the actions to be implemented by the Company or the Group in order to comply with the objectives of the multi-year energy programme (see section 7.1.6.2 "Public service in France"), the Group's strategy relating to nuclear fuel cycle, gas and renewable energies and the public service contract (see section 7.1.6.2 "Public service in France"). It regularly examines, in connection with the strategy that it defines, opportunities and risks such as financial, legal, operational, social and environmental risks, as well as the measures taken as a consequence. Within this framework, it examines in particular risks and opportunities relating to climate change and their impact on the Group's strategy and its activities.

The Board ensures the implementation by the Company of a programme to prevent and detect corruption and influence-peddling and a policy to promote non-discrimination and diversity, particularly in terms of balanced representation of women and men on the Company's governing bodies (see section 4.2.1 "Members of the Board of Directors"). In accordance with the provisions of Article L. 225-37-1 of the French Commercial Code, the Board of Directors deliberates annually on the Company's policy in terms of equal access to employment and equal pay and defines the Company's strategic aims submitted to the EDF Central Social & Economic Council in accordance with Article L. 2312-17 and Article L. 2312-19 of the French Labour Code.

In accordance with its internal Rules of Procedure, the Board of Directors is competent to authorise, in accordance, where appropriate, with the governance of the Group's listed companies, the following transactions prior to their implementation:

- external growth transactions (investments, mergers and acquisitions), divestments, organic growth transactions, as well as stock exchange transactions, carried out by the Company or by one of its subsidiaries, which represent overall financial exposure for the Company or the Group exceeding €350 million; this threshold falls to €150 million for transactions not in line with the Company's or the Group's strategic objectives;
- coherent and inseparable industrial programmes of investments or works on existing assets, by the Company or one of its subsidiaries, exceeding €350 million per programme;
- real estate transactions, carried out by the Company or one of its subsidiaries, exceeding €200 million;
- certain financial transactions (long-term borrowings, debt management, securitisation or hedging transactions) whenever they exceed €5 billion (or the equivalent in any other currency);
- contracts and agreements (supplies, work or services) entered into by the Company involving amounts, including any necessary subsequent amendments, exceeding €350 million, or between €200 million and €350 million if these contracts relate to a new strategic direction or a new business line for the Group;
- long-term contracts for the purchase or sale of energy, CO_2 emission credits and quotas, by the Company or by one of its subsidiaries, for annual volumes or amounts in excess of 10TWh for electricity, 20TWh for gas (detailed information must also be provided on long-term gas purchase or sale agreements greater than 5TWh and less than 20TWh at the meeting of the Board of Directors *a posteriori*) and €250 million for coal, fuel oil, and CO_2 emission credits and quotas;
- strategic agreements to be entered into by the Company constituting firm and irrevocable commitments relating to cooperation or partnerships with one or more foreign partners, in the nuclear industry involving significant transfers of intellectual property or technologies on the Group's part and constituting major challenges for the Group.

The Board of Directors sets the framework of the policy for the constitution, management and risk management of assets for hedging EDF's nuclear commitments, specifically ruling on asset/liability management and asset allocation strategy. If the Nuclear Commitments Monitoring Committee issues a negative opinion on a plan to invest in unlisted assets for dedicated assets, the Board has sole authority to authorise the aforementioned plan (see section 4.2.3.2 "Nuclear Commitments Monitoring Committee").

In accordance with Article L. 311-5-7 of the French Energy Code, the Government Commissioner may oppose investment decisions, the realisation of which would be inconsistent with the objectives of the strategic plan prepared by the Company or with those of the multi-year energy programme (see section 7.1.6.2 "Public service in France").

4.2.2.4 Evaluation of director independence

Total number of Directors	18
Number of independent directors	5
Percentage of independent directors*	41.7%

* *Excluding directors representing the employees.*

The AFEP-MEDEF Corporate Governance Code recommends that, in companies with a controlling shareholder, the proportion of independent directors should be at least one third of the Board of Directors and specifies that directors representing employees are not taken into account to calculate the proportion of independent directors.

The table below reiterates the independence criteria stated by the AFEP-MEDEF Code:

Independence criteria
Criterion 1: Employee or corporate officer in the previous five years Must not be or have been within the previous five years an employee or executive officer of the Company, an employee, executive officer or director of a company consolidated within the corporation, an employee, executive officer or director of the Company's parent company or a company consolidated within this parent company.
Criterion 2: Cross directorships Must not be an executive officer of a company in which the Corporation holds a directorship, directly or indirectly, or in which an employee appointed as such or an executive officer of the Corporation (currently in office or having held such office within the last five years) holds a directorship.
Criterion 3: Significant business relationships Must not be a customer, supplier, commercial banker, investment banker or consultant that is significant to the corporation or its group or for which the corporation or its group represents a significant portion of its activity The evaluation of the significance or otherwise of the relationship with the Company or its group must be debated by the Board and the quantitative and qualitative criteria that led to this evaluation must be clarified in the annual report.
Criterion 4: Family ties Must not be related by close family ties to a corporate officer.
Criterion 5: Auditor Must not have been an Auditor of the corporation within the previous 5 years.
Criterion 6: Period of office exceeding 12 years Must not have been a director of the Corporation for more than 12 years. Loss of the status of independent director occurs on the date of the 12th anniversary.
Criterion 7: Variable remuneration or performance-based remuneration Must not receive variable remuneration in cash or securities or any remuneration related to the performance of the Company or the Group.
Criterion 8: Major shareholders Directors representing a major shareholder of the corporation or its parent company may be considered independent, provided these shareholders do not take part in the control of the corporation. Nevertheless, beyond a 10% threshold in capital or voting rights, the Board should systematically question the status of independent taking into account the structure of the Company's capital and the existence of a potential conflict of interest.

Evaluation of director independence

The Board of Directors annually reviews the individual situation of the directors with regard to the independence criteria provided in the AFEP-MEDEF Code. It may also be called upon to make a decision during the year in the event of a change in the membership of the Board or the status of a Director justifying a review of his or her independence.

At a meeting on 7 February 2020, the Appointments, Remuneration & Governance Committee (see section 4.2.3 "Board of Directors' Committees") examined the individual situations of Directors, taking into account the independence criteria provided for by the AFEP-MEDEF Code. The Board of Directors, at its meeting of 13 February 2020, performed its annual evaluation of director independence and confirmed the classification as independent directors of Ms Lewiner, Ms Parisot, Ms Pedini, Mr Crémel, and Mr Petitcolin.

At a meeting on 9 February 2021, the Appointments, Remuneration & Governance Committee examined the situation of Directors, taking into account the independence criteria provided for in the AFEP-MEDEF Code.

The Committee noted that Jean-Bernard Lévy, due to his capacity as Chairman & Chief Executive Officer, and therefore Executive Officer cannot be considered as an independent director (criterion no. 1).

The directors appointed on the recommendation of the French State in accordance with Article 6 of Order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding "represent", by virtue of this law, "the interests of the French State as shareholder". In view of the criteria set by the AFEP-MEDEF Code, these directors cannot be considered as independent (criterion no. 8). The same holds true for the Representative of the French State appointed pursuant to the provisions of Article 2 of the Order of 20 August 2014, in his capacity as representative of EDF's majority shareholder (criterion no. 8).

Finally, directors representing employees are not subject to an assessment, in accordance with the recommendations of the AFEP-MEDEF Code.

With respect to business relationships, the Committee examined the situation of Ms Lewiner, Ms Parisot, Ms Pedini, Mr Crémel, and Mr Petitcolin with regard to criterion no. 3 provided for in the AFEP-MEDEF Code. In particular, the Committee examined any business ties that might exist between the Company and companies, in which these directors hold offices or senior management positions, as well as groups to which they belong, on a quantitative level (importance of any business relations existing between the Company and these companies, their groups, and sales between them recorded in the course of the 2020 fiscal year), and on a qualitative level (director's position in the companies in question, nature of business relations, any economic dependence, exclusivity, etc.). Based on their findings, none of the companies, in which Ms Lewiner, Ms Parisot, Ms Pedini, Mr Crémel, and Mr Petitcolin hold offices or senior management positions, nor any of the Groups to which they belong, could be classified as a significant client, supplier, business banker, financing banker or important consultant of the EDF group, nor could EDF be considered a significant client or supplier of these companies or their groups. Following these analyses, the Committee therefore concluded that there were no significant business ties involving these directors.

After receiving the Committee's opinion, the Board of Directors assessed the individual situation of Mrs Lewiner, Mrs Parisot, Mrs Pedini, Mr Crémel and Mr Petitcolin at its meeting on 17 February 2021 and confirmed their independence in accordance with the independence criteria set out in the AFEP-MEDEF Code. The Board deemed that none of these directors had any relations with the Company, its Group or its management that might compromise the exercise of their freedom of judgement.

On the date of filing this Universal Registration Document, the Company's Board of Directors therefore features five independent directors out of the twelve taken into account to make the calculation in accordance with the AFEP-MEDEF Code, *i.e.* a proportion higher than the recommendations of the AFEP-MEDEF Code.

The table below presents the situation of the directors classified as independent taking into account the criteria provided for in the AFEP-MEDEF Code:

	Criterion no. 1	Criterion no. 2	Criterion no. 3	Criterion no. 4	Criterion no. 5	Criterion no. 6	Criterion no. 7	Criterion no. 8	Final classification
Colette Lewiner	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Laurence Parisot	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Claire Pedini	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Bruno Crémel	✓	✓	✓	✓	✓	✓	✓	✓	Independent
Philippe Petitcolin	✓	✓	✓	✓	✓	✓	✓	✓	Independent

✓: means that the criterion is met.

4.2.2.5 Evaluation of the functioning of the Board of Directors and its Committees

In accordance with the provisions of the AFEP-MEDEF Code, the Board's internal Rules of Procedure state that the Appointments, Remuneration & Governance Committee shall supervise annually an evaluation of the functioning of the Board of Directors and propose areas for improvement. Once a year, therefore, the Board dedicates one item on its agenda to this evaluation and holds a discussion on its functioning and that of its Committees in order to improve its efficiency and ensure that important issues are appropriately prepared and discussed.

Every three years, this evaluation is conducted by an independent external consultant under the supervision of the Appointments, Remuneration & Governance Committee.

2019 annual evaluation

The 2019 annual evaluation was conducted internally using a questionnaire including both closed-ended questions, enabling statistical monitoring of the answers provided by directors, and open-ended questions, enabling directors to give detailed answers, provide qualitative observations, propose changes, and share their expectations for the 2020 fiscal year. The Directors completed this questionnaire anonymously and the results of the assessment were presented and discussed at an executive session [(1)] held on 12 December 2019.

2020 three-yearly evaluation

The last external evaluation was conducted in 2016 by an independent board, under the guidance of the Committee in charge of the Governance issues. Accordingly, an analysis of the individual contribution of each Director to the Board's work was conducted.

In view of the major changes made to the membership of the Board of Directors in the course of the 2019 fiscal year, it was decided to postpone by one year the external evaluation of the Board and Committees, which has therefore been conducted in 2020. This evaluation was conducted by a specialised external firm, selected following a call for tenders, under the supervision of the Appointments, Remuneration and Governance Committee. The evaluation was conducted during the third quarter of 2020, *via* in-depth interviews with each of the directors based on a questionnaire and an interview guide prepared by the specialist firm in collaboration with the Chair of the Committee.

The conclusions of this evaluation were examined at a meeting of the Appointments, Remuneration and Governance Committee on 9 December 2020, before being presented to the Board on 16 December 2020.

The results of this evaluation showed that the directors believe that the quality of the work of the Board and its Committees has continued to improve in recent years. The members consider that the Board is working in a professional and committed manner. The quality of all directors and the diversity of opinions represented are appreciated. The dynamics of the discussions, based in particular on the transparency of the information provided and the commitment of the members, are considered constructive. The directors consider that the functioning and organisation of the work of the Board and its Committees are rigorous and adapted to the complexity of the Company.

Among the areas for improvement identified are actions aimed at prioritising the work of the Board, by continuing to discuss on a selection of the subjects addressed, a better contribution to the monitoring of the Group's major operating risks and, finally, further strengthening the contribution of the Board and the Committees on structural subjects, notably by strengthening the Board's skills in the areas of senior management of large companies, in the energy sector and possibly internationally.

As part of this external evaluation, an analysis of the individual contribution of the directors to the Board's work was conducted. The independent consultant provided individual and confidential feedback to each of the directors, as was the case for the previous evaluation in 2016.

4.2.2.6 Information and training of Directors – Digitalisation

The Chairman & Chief Executive Officer ensures that the directors have the necessary information for them to carry out their remit. This information is provided to them as soon as possible to enable them to carry out their remit in the best conditions.

Under the Board's internal Rules of Procedure, it periodically receives information on the financial, treasury and off-balance sheet commitments position of the Company and the Group, as well as information on the performance of the Company's principal subsidiaries on the occasion of the presentation of the annual and half yearly financial statements, in addition to the purchasing and human resources policy. The Board of Directors is also regularly informed of changes to the Company's markets, competitive environment and the main challenges facing the Company, including in the field of corporate social, societal and environmental responsibility.

A document reviewing the Group's current major business sectors and the market trends, as well as the economic, financial and institutional context is regularly communicated to the Board of Directors. The Company also provides them with quarterly monitoring of key indicators concerning EDF and the Group, and more generally with any useful information between Board meetings, in accordance with the significance or urgency of the matter.

The directors can add to this information by meeting with the principal executives of the Company or Group, without the Chairman's presence being necessary, to discuss issues on the Board's agenda.

Finally, each Director can receive additional training in the specific characteristics of the Company and the Group, their business activities and their field of activity, as well as specific themes falling within the remit of the Committees of which they are members. Information meetings may also be organised on complex matters or issues of major strategic importance, together with any training requested by members.

Since 2016, the Board of Directors has been using a digital platform, which allows for the smooth, swift and secure availability of Board and Committee files. Since 2020, in the context of the health crisis, the Board has been using a secure videoconferencing tool for its meetings when they are held remotely.

4.2.2.7 Obligations and duties of Directors

The internal Rules of Procedure of the Board of Directors state that its members are subject to obligations such as: acting in all circumstances in the corporate interest of the Company, informing the Board of situations of conflict of interest (see also section 4.4.1 "Conflicts of interest"), and refraining from contributing to the discussions and voting on any decision in which there might be a conflict of interest, fulfilling the obligation of confidentiality, carrying out their term of office with diligence and commitment, and complying with the EDF Stock Exchange code of ethics.

The directors and the Chairman & Chief Executive Officer are required to immediately inform the Board of any agreement entered into by the Company in which they hold a direct or indirect interest, or which might be entered into through an intermediary.

In addition to the right to obtain disclosure of the documents and information necessary to perform their work, the directors also have a duty to request the information they deem essential to carry out their duties in the appropriate manner.

Under the internal Rules of Procedure, each Director undertakes to ensure that his or her status complies with the French Commercial Code and the AFEP-MEDEF Code recommendations on plurality of offices and to keep the Board informed of offices they hold at other companies. The Chairman & Chief Executive Officer is also required to inform the Board of Directors before accepting an appointment in a listed company.

(1) Meeting without the presence of the Chairman and Chief Executive Officer.

4.2.2.8 Activity of the Board of Directors in 2020

	2020	2019
Number of meetings	9*	12*
Average attendance rate	96.3%	91.7%
Average duration of the meetings	3 hours and 27 minutes	2 hours and 40 minutes

* *In addition to this number of meetings, a one-day strategic seminar is also held.*

The table below shows the individual attendance rate of Directors over the 2020 fiscal year:

Directors	Average attendance rate in 2020
Jean-Bernard Lévy	100%
Véronique Bédague-Hamilius	100%
Claire Bordenave	100%
Jacky Chorin	89%
Bruno Crémel	100%
François Delattre	89%
Gilles Denoyel	100%
Karine Granger	89%
Marie-Christine Lepetit	89%
Colette Lewiner	100%
Laurence Parisot	100%
Claire Pedini	100%
Philippe Petitcolin	78%
Jean-Paul Rignac	100%
Vincent Rodet	100%
Michèle Rousseau	100%
Christian Taxil	100%
Martin Vial	100%

In 2020, the Board of Directors reviewed and/or authorised in particular, in addition to numerous items relating to the Company's regular business, a draft of EDF's *raison d'être*, after receiving the opinion of the Corporate Responsibility Committee and before submission to the Shareholders' Meeting of 7 May 2020, EDF's business strategy, the continuation of the EPR2 programme and the outlook for new French nuclear power, the strategy and outlook for Enedis, the corporate strategic plan pursuant to the Multi-Year Energy Programme (see section 7.1.6.2 "Public service in France"), the final investment decision on the Fécamp offshore wind power project, the project to build the Larivot power plant in French Guiana, the issuance of green OCEANE bonds, progress on the proposed sale of Edison's Exploration & Production business, progress on the implementation of the Excell plan and the Flamanville, Hinkley Point C and Sizewell C EPR projects, as well as the *Grand Carénage* programme, the Company's nuclear fuel cycle strategy, the progress of the Ecocombust project, EDF's policy on professional and salary equality, the Company's strategic orientations with a view to consulting EDF's Central Economic and Social Committee and the conclusions of the external evaluation of the Board and its Committees (see section 4.2.2.5 "Evaluation of the functioning of the Board of Directors and its Committees").

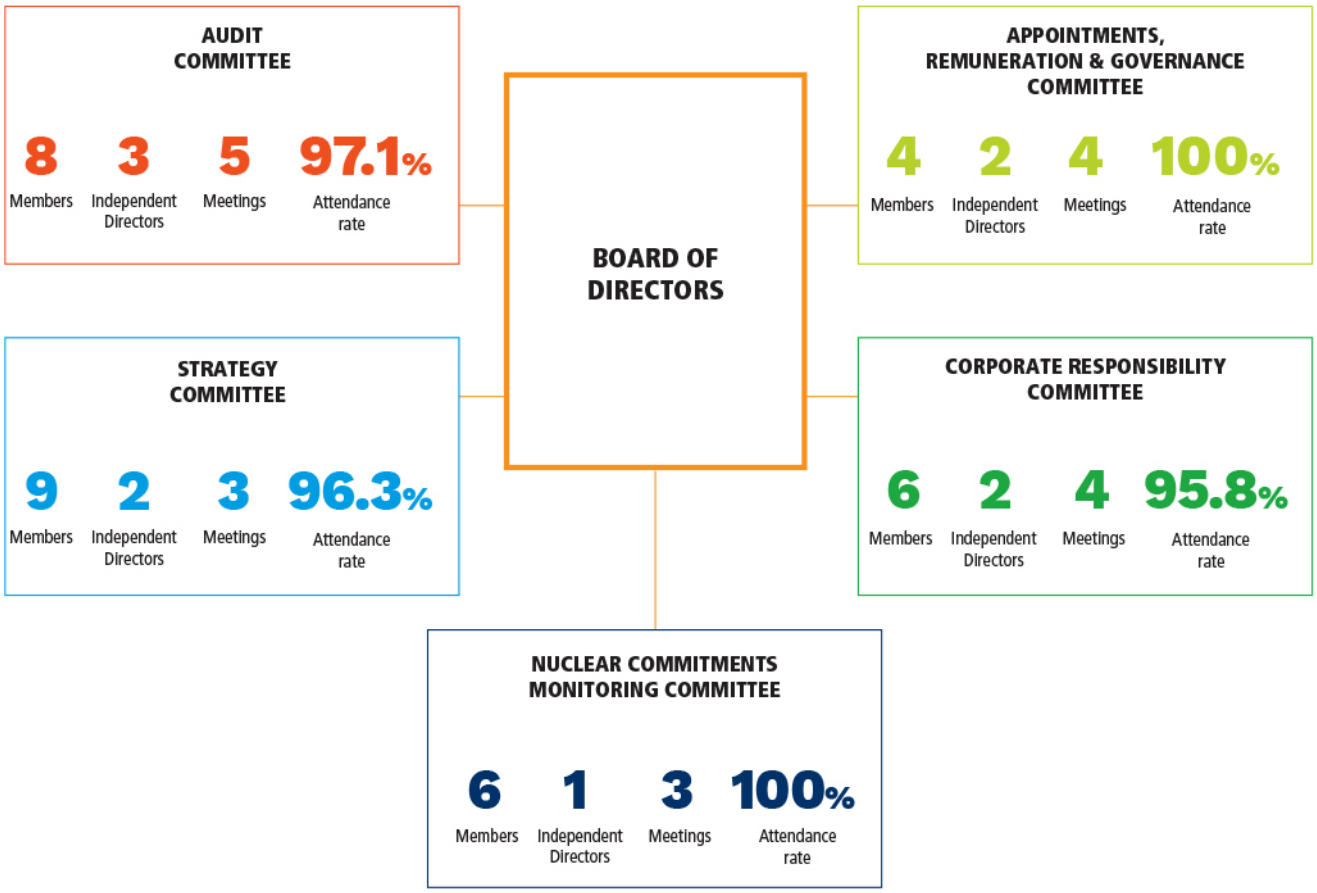
The Board held an extraordinary meeting in March 2020 entirely dedicated to the management of the health crisis and the Group's business continuity plans. Briefings on the situation of the Company, the Group and its employees in the context of the crisis were then given at each Board meeting during the past fiscal year, as well as on the impact of the crisis on the French nuclear fleet and the Group's major projects. The Board was thus able to ensure that the business continuity of the Group was ensured under the best possible conditions, that changes in the Group's major risks were closely monitored in this context and that the health of employees was preserved.

The directors meet once a year to discuss the strategy of the Company and of the Group as part of an *ad hoc* seminar. During the 2020 strategy seminar, the Board discussed the commitments and opportunities related to carbon neutrality in 2050, the strategy of similar companies and oil companies in Europe, scenarios for the decarbonisation of the French energy mix by 2050 and the Group's prospects and action plan for electric mobility and low-carbon hydrogen in the context of the decarbonisation of the transport sector.

Finally, under the internal Rules of Procedure for the Board of Directors, a meeting is to be held each year without the attendance of the Chairman & Chief Executive Officer (executive session), which is chaired by the Chair of the Appointments, Remuneration & Governance Committee (see section 4.2.2.3 "Powers and duties of the Board of Directors"). In view of the difficulties related to the health crisis in 2020, the executive session was postponed to the first quarter of 2021, if the sanitary conditions allow it, as the directors considered it preferable to hold this meeting in person.

4.2.3 Board of Directors' Committees

Presentation of the Committees [1]



To perform its duties, the Board of Directors has created five Committees to examine and prepare certain issues before they are presented to the whole Board. These specialised Committees are: the Audit Committee, the Nuclear Commitments Monitoring Committee, the Strategy Committee, the Corporate Responsibility Committee, and the Appointments, Remuneration & Governance Committee.

The members, functioning and duties of the Committees are governed by the internal Rules of Procedure of the Board of Directors.

The Committees include at least three directors chosen by the Board, which appoints the Chair of each Committee. The Company's articles of association state that each Committee should include at least one director representing the employees.

On the date of this document, the Chairs of the Board Committees were as follows:

- Mr Jean-Bernard Lévy for the Strategy Committee;
- Ms Marie-Christine Lepetit for the Audit Committee;
- Mr Gilles Denoyel for the Nuclear Commitments Monitoring Committee;
- Ms Claire Pedini for the Corporate Responsibility Committee;
- Ms Colette Lewiner for the Appointments, Remuneration & Governance Committee.

The Government Commissioner and the Head of the French State General Economic and Financial Supervisory Mission to the Company can attend the meetings of these Committees. The Government Commissioner may be represented to these Committees.

The work of the Committees is organised within a programme prepared for the year. Meetings are recorded in the form of written Minutes, and the Committee Chair gives an oral report at the following meeting of the Board of Directors.

The Board's internal Rules of Procedure provide that the Committees shall meet in sufficient time before the Board's meeting, the agenda of which includes consideration of matters falling within their remit.

The Committees may invite Company executives, including the Chairman & Chief Executive Office, to attend their meetings. They may also invite other parties to attend, whether employed by the Company or not, provided they inform the Chairman & Chief Executive Officer in advance and on the condition that they report such attendance to the Board. The Committees may also seek external technical advice and order studies on issues falling within their remit, at the Company's expense, after having informed the Chairman & Chief Executive Officer and provided that they report this matter to the Board.

In 2020, the average overall attendance rate of the Committees was 97.9%. The average rate of attendance per Committee is provided under section 4.2.3.1 to 4.2.3.5 below.

(1) Data for the fiscal year 2020, except for data on the composition of the Committees, which are given as of the date of filing of this Universal Registration Document.

The table below shows the individual attendance rate of director members of Committees over the 2020 fiscal year:

Individual attendance rate of Directors in 2020	Audit Committee	Nuclear Commitments Monitoring Committee	Strategy Committee	Corporate Responsibility Committee	Appointments, Remuneration & Governance Committee
Jean-Bernard Lévy			100%		
Véronique Bédague-Hamilius				100%	
Claire Bordenave				100%	
Jacky Chorin	100%		67%	100%	
Bruno Crémel	100%				
François Delattre			100%		
Gilles Denoyel		100%			
Karine Granger		100%	100%		100%
Marie-Christine Lepetit	100%	100%			
Colette Lewiner	80%	100%			100%
Laurence Parisot			100%	75%	
Claire Pedini				100%	100%
Philippe Petitcolin			100%		
Jean-Paul Rignac	100%				
Vincent Rodet	100%	100%	100%	100%	
Michèle Rousseau		100%			
Christian Taxil	100%		100%		
Martin Vial			100%		100%

4.2.3.1 Audit Committee

Membership

In accordance with the provisions of Article L. 823-19 of the French Commercial Code and the recommendations of the AFEP-MEDEF Code, the Audit Committee includes two-thirds of independent members and does not include any executive officer.

The table below outlines the membership of the Committee on the date of filing of the Universal Registration Document.

Members of the Audit Committee		
Marie-Christine Lepetit	Chair	Director appointed by the Shareholders' Meeting on recommendation from the French State
Jacky Chorin	Member	Director elected by the employees
Bruno Crémel	Member	Independent director appointed by the Shareholders' Meeting
Colette Lewiner	Member	Independent director appointed by the Shareholders' Meeting
Philippe Petitcolin*	Member	Independent director appointed by the Shareholders' Meeting
Jean-Paul Rignac	Member	Director elected by the employees
Vincent Rodet	Member	Director elected by the employees
Christian Taxil	Member	Director elected by the employees

* *Mr Petitcolin was appointed member of the Audit Committee by the Board of Directors on 17 February 2021.*

Number of members	8
Number of independent directors	3
Percentage of independent directors*	75%

* *Excluding directors representing the employees.*

Article L. 823-19 of the French Commercial Code states that at least one member of the Committee must have specific skills in financial or accounting matters and be independent based on the criteria defined and made public by the Board of Directors. Furthermore, Article 16.1 of the AFEP-MEDEF Code recommends that all members of the Audit Committee have financial or accounting skills, that the re-election of the Chair of the Committee be specifically examined by the Board and that the proportion of independent directors on the Board be at least two-thirds, excluding directors representing employees.

The Board of Directors, meeting on 16 May 2019 following the Shareholders' Meeting, re-examined the membership of the Committee, taking account of changes to the membership of the Board. Regarding the Audit Committee, the Board particularly noted that Ms Lepetit, whose re-election as Chair of the Audit Committee was recommended, as well as Ms Lewiner and Mr Crémel, have specific financial and accounting skills in accordance with the criteria recommended by the Autorité des marchés financiers (AMF) (French Financial Markets Authority) in its report on the Audit Committee of 22 July 2010. The Board therefore found that Ms Lewiner and Mr Crémel meet the criteria regarding both skills and independence set out in Article L. 823-19 of the French Commercial Code (see section 4.2.2.4 "Evaluation of director independence").

After receiving the opinion of the Appointments, Remuneration and Governance Committee, the Board of Directors appointed Mr Petitcolin as a member of the Audit Committee on 17 February 2021 and noted that he has expertise in financial and accounting matters. Mr Petitcolin thus meets the criteria regarding both skills and independence set out in Article L. 823-19 of the French Commercial Code (see section 4.2.2.4 "Evaluation of director independence").

Duties

The Audit Committee carries out the duties entrusted to it in accordance with Article L. 823-19 of the French Commercial Code under the supervision of the Board of Directors. In accordance with this article, the Committee is tasked with the following duties in particular:

- monitoring the process to prepare financial information and making any recommendations to guarantee its integrity;
- monitoring the effectiveness of the internal control, risk management and internal audit systems, regarding procedures relating to the preparation and processing of accounting and financial information;
- monitoring the performance of the duties of the Statutory Auditors, ensuring their independence, and approving the provision of the services mentioned in Article L. 822-11-2 of the French Commercial Code.

In fulfilling its duties, it examines and gives its opinion to the Board of Directors, on:

- the Company's financial position, the medium-term plan and the budget;
- the preliminary and consolidated annual and half-yearly financial statements and related financial reports;
- the monitoring of risks and internal control (mapping of Group risks and methods of detection, anticipation and management of risks in all areas, including social, environmental and climate change risks, organisation and evaluation of internal control processes); in this context, it ensures, in conjunction with the Corporate Responsibility Committee, the existence of programmes for the internal control and management of the main risks in terms of ethics, compliance, and corporate responsibility;
- the audit (annual audit programme, main findings and corrective actions, action plan, monitoring of their implementation);
- the monitoring of the Statutory Auditors (coordination of the auditor selection procedure, monitoring of the Statutory Auditors' fulfilment of their duties taking account, where applicable, of the findings and conclusions of the Haut Conseil du Commissariat aux comptes (*i.e.* French High Council of Auditors), verification of the Statutory Auditors' compliance with the conditions of independence provided for in the applicable laws, opinion on the amount of fees, approval of the provision by the Statutory Auditors of procedures other than the certification of accounts in accordance with a procedure approved by the Board of Directors on 3 November 2016);
- the financial aspects of external growth or divestment activities that are particularly significant (see section 4.2.2.3 "Powers and duties of the Board of Directors");
- the policies in terms of insurance, energy market risks and risk of bankruptcy of the Group's counterparties.

The examination of the financial statements by the Committee is accompanied by a presentation by the Statutory Auditors underlining the bases for the preparation of the financial statements, the applicable accounting frame of reference, the audit approach implemented and the conclusions of their auditing work or limited review. In addition to the meetings of the Audit Committee devoted to examining the annual and half-yearly financial statements, the Statutory Auditors also attend the meetings devoted to risk monitoring, internal control and auditing.

For the purposes of its work, the Committee regularly meets with the Statutory Auditors, Executive Management, Corporate Finance, Group Risk Management and Internal Auditing.

Activity in 2020

The table below presents the statistical data relating to the 2019 and 2020 fiscal years:

	2020	2019
Number of meetings	5	6
Average attendance rate	97.1%	100%
Average duration of the meetings	3 hours and 7 minutes	2 hours and 31 minutes

In 2020, the Audit Committee examined in particular the half-yearly and annual financial statements and the related financial reports, the presentation of the Statutory Auditors' 2020 audit plan and the key points of the findings of their audit, the 2021 budget, and the 2021-2023 medium-term plan (MTP), the review of the value of assets and the methodology for calculating the discount rate for nuclear provisions with a view to the closing of the 2020 financial statements, off-balance sheet commitments, the updated risk mapping taking account of the reassessment of the risks following the health crisis, risk monitoring and control methods and the improvement initiatives identified, the audit plan, the summary of internal audits, the follow up of the implemented action plans, the annual financial management and financial risk control mandate and the Group's annual counterparty risk summary.

In 2020, in accordance with the procedure approved by EDF's Board of Directors on 3 November 2016, the Committee authorised the Statutory Auditors and the members of their network to provide services other than the certification of the financial statements and it was informed on a half-yearly basis of the services provided as part of the pre-approval process under the terms of this procedure.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2020 fiscal year.

4.2.3.2 Nuclear Commitments Monitoring Committee

Membership

The table below outlines the membership of the Nuclear Commitments Monitoring Committee on the date of filing of the Universal Registration Document:

Members of the Nuclear Commitments Monitoring Committee

Gilles Denoyel	Chairman	Director appointed by the Shareholders' Meeting on recommendation from the French State
Karine Granger	Member	Director elected by the employees
Marie-Christine Lepetit	Member	Director appointed by the Shareholders' Meeting on recommendation from the French State
Colette Lewiner	Member	Independent director appointed by the Shareholders' Meeting
Vincent Rodet	Member	Director elected by the employees
Michèle Rousseau	Member	Director appointed by the Shareholders' Meeting on recommendation from the French State

Number of members	6
Number of independent directors	1
Percentage of independent directors*	25%

* *Excluding directors representing the employees.*

Duties

The Nuclear Commitments Monitoring Committee (NCMC) was created by Article 9 of Decree no. 2007-243 of 23 February 2007 on the securing of the financing of long-term nuclear expenses. It is tasked with monitoring the value of nuclear liabilities and changes in the related provisions, issuing an opinion on issues relating to the governance of dedicated assets, the rules for asset-liability matching and on strategic allocation, as well as examining the results of the management of assets constituted by the Company and verifying the compliance of such management with the rules on constituting, managing, and controlling the financial risks of dedicated assets. It provides the Board with an opinion on the internal control procedure for the financing of the expenses relating to decommissioning of nuclear facilities, spent fuel management and disposal of radioactive waste, as set out in Article L. 594-1 of the French Environmental Code.

The Committee relies on the works of the Nuclear Commitments Financial Expertise Committee (NCFEC) which is comprised of independent experts appointed by the Board [(1)], whose duty is to assist the Company and its corporate bodies with matters relating to asset-liability matching and the management of dedicated assets.

Finally, the Committee issues an opinion prior to any investment in unlisted dedicated assets for any project exceeding a unit amount of €400 million as well as for any project (excl. real estate) exceeding a unit amount of €200 million resulting in full consolidation of the target investment by the Company. In case the Committee issues a negative opinion on an investment plan, the Board of Directors has sole authority to authorise the aforementioned plan.

Activity in 2020

	2020	2019
Number of meetings	3	3
Average attendance rate	100%	94.4%
Average duration of the meetings	3 hours and 11 minutes	2 hours and 45 minutes

In 2020, the Committee examined the coverage situation and the discount rate for nuclear provisions, the performance of the portfolio of listed and unlisted dedicated assets, the works and discussions on changes in the strategic allocation included in the policy on the constitution, management and control of the financial risks involving dedicated assets, the update letter on the three-yearly report on the securing of financing for nuclear expenses and the report on internal control which it includes, the follow up of risks related to dedicated assets, the state of progress of the first-generation nuclear power plant decommissioning programme and the industrial geological storage centre (CIGEO) and activated waste packaging and storage facility (ICEDA) projects (see section 1.4.1.1.2.3 "Nuclear Power Issues") and the Charter for Responsible Investment in Dedicated Assets).

The Statutory Auditors attend the meetings of the Committee.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2020 fiscal year.

(1) The current members of the NCFEC were re-elected or appointed on 19 November 2019 for three years by the Board of Directors after consultation with the NCMC.

4.2.3.3 Strategy Committee

Membership

The table below outlines the membership of the Committee on the date of filing of the Universal Registration Document. The directors who are not members of the Strategy Committee may attend its meetings.

Members of the Strategy Committee		
Jean-Bernard Lévy	Chairman	Chairman & Chief Executive Officer, Director appointed by the Shareholders' Meeting
Jacky Chorin	Member	Director elected by the employees
François Delattre	Member	Director appointed by the Shareholders' Meeting on recommendation from the French State
Karine Granger	Member	Director elected by the employees
Laurence Parisot	Member	Independent director appointed by the Shareholders' Meeting
Philippe Petitcolin	Member	Independent director appointed by the Shareholders' Meeting
Vincent Rodet	Member	Director elected by the employees
Christian Taxil	Member	Director elected by the employees
Martin Vial	Member	Representative of the French State.

Duties

The Strategy Committee examines and/or issues an opinion to the Board of Directors on the Company's major strategic orientations and, specifically, on the corporate strategic plan setting out the actions to be implemented in order to comply with the objectives of the multi-year energy programme (see section 7.1.6.2 "Public service in France"), the Company's strategic orientations drawn up with a view to the consultation of the EDF Central Social and Economic Committee, the public service contract (see section 7.1.6.2 "Public service in France"), strategic agreements, alliances and partnerships, as well as research and development policy.

Activity in 2020

	2020	2019
Number of meetings	3	3
Average attendance rate*	96.3%	96.3%
Average duration of the meetings	3 hours and 13 minutes	3 hours and 5 minutes

* *Attendance rate calculated based on the members of the Committee alone (furthermore, all the members of the Board may attend these meetings).*

In 2020, the Committee examined in particular the performance and prospects of EDF Renewables, the strategy of EDF's Customers, Services and Territories Division and the Group's BtoB strategy, Dalkia's strategic orientations, the impact of the health crisis on the industrial programme of the French nuclear fleet and how it will overcome the winter season 2020-2021, the main assumptions of the 2021-2023 medium-term plan, the Company's strategic orientations with a view to consulting EDF's Central Social and Economic Committee, as well as the Group's Research & Development policy.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2020 fiscal year.

4.2.3.4 Corporate Responsibility Committee

Membership

The table below outlines the membership of the Corporate Responsibility Committee on the date of filing of the Universal Registration Document:

Members of the Corporate Responsibility Committee		
Claire Pedini	Chair	Independent director appointed by the Shareholders' Meeting
Véronique Bédague-Hamilius	Member	Director appointed by the Shareholders' Meeting on recommendation from the French State
Claire Bordenave	Member	Director elected by the employees
Jacky Chorin	Member	Director elected by the employees
Laurence Parisot	Member	Independent director appointed by the Shareholders' Meeting
Vincent Rodet	Member	Director elected by the employees

* *Ms Véronique Bédague-Hamilius was appointed Member of the Committee by the Board on 2 April 2020.*

Number of members	6
Number of independent directors	2
Percentage of independent directors*	66,67%

* *Excluding directors representing the employees.*

Duties

The Corporate Responsibility Committee examines, in connection with the Group's strategy, the Group's commitments and policies, as well as their implementation, in terms of ethics, compliance, and corporate responsibility. It examines the way in which the Company takes account of issues relating to climate change. In conjunction with the Audit Committee, it ensures the existence of programmes to identify and manage the main risks in these fields and compliance with legal and regulatory provisions.

In the line of its duties, it examines particularly the factors constituting the declaration of extra-financial performance included in the management report in accordance with the French Commercial Code, in conjunction with the Audit Committee, the annual ethics and compliance report, the EDF mediator's annual report, as well as the annual reports by the French inspector general for nuclear safety and radiation protection and the inspector for hydropower safety (see sections 1.4.1.3.1.3 "Hydropower safety" and 1.4.1.1.2.2 "Environment, nuclear safety, radiation protection").

The Committee submits an opinion to the Board on the way in which the Company implements a non-discrimination and diversity policy, particularly in terms of balanced representation of women and men in governing bodies.

In accordance with best market practice and stakeholder expectations with regard to the governance of climate issues, the Company has further strengthened its climate governance in 2020 by appointing a Climate point person to the Board of Directors. In addition to the missions already entrusted to the Board, the Corporate Responsibility Committee and the Audit Committee in terms of monitoring the risks and opportunities related to climate change, the Chair of the Corporate Responsibility Committee was designated as Climate point person to the EDF's Board of Directors. As Climate point person, in line with EDF's *raison d'être*, the Chair of the Committee is responsible for:

- ensuring, in conjunction with the Chairman of the Board of Directors and the Executive Committee's Climate point person (see section 3.1.3 "EDF Climate Governance"), that the Board of Directors identifies all the impacts of climate change for the Group and that the Board's work and the strategy it defines incorporate such climate change issues;
- regularly informing the Board of the Company's climate strategy, after presentation to the Corporate Responsibility Committee by the Climate point person of the Executive Committee;
- ensuring, in conjunction with the Chairman of the Board, that the Corporate Responsibility Committee and the Board regularly review the implementation of the Group's carbon neutrality trajectory adopted by the Executive Committee;
- understanding, in the context of the Corporate Responsibility Committee's duties, how the Group applies the recommendations of the Taskforce on Climate related Financial Disclosures (TCFD) (see sections 3.1 "Carbon Neutrality and the Climate" and 3.1.3 "EDF Climate Governance") and reports on climate-related risks.

The Committee may submit any opinions, proposals and recommendations to the Board of Directors in fields falling within its remit.

Activity in 2020

	2020	2019
Number of meetings	4	8
Average attendance rate	95.8%	87.5%
Average duration of the meetings	2 hours and 23 minutes	1 hour and 20 minutes

More precisely, in 2020, the Committee examined EDF's draft *raison d'être*, prior to its adoption by the Board of Directors and its submission to the Shareholders' Meeting of 7 May 2020 (see section 1.2.3 "Significant events of the year"), the Group's implementation of the duty of care and the associated risks, and the 2019 statement of non-financial performance included in the 2019 management report, the 2050 carbon neutrality trajectory, the Group's commitments to biodiversity, the results of the "My EDF" 2019 survey, the 2019 report of the EDF Ombudsman, EDF's policy and report on gender, professional and salary equality, the draft gender equality policy for EDF's management bodies prior to its approval by the Board (see section 4.2.1 "Members of the Board of Directors"), the Group's health and safety policy and review, the Group's annual ethics and compliance review, the Group's new CSR architecture, an update on the new employee representative bodies and social dialogue within the EDF group, as well as the 2019 reports of the Inspector General for Nuclear Safety and Radiation Protection and the Inspector for Hydropower Safety.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2020 fiscal year.

4.2.3.5 Appointments, Remuneration & Governance Committee

Membership

The table below outlines the membership of the Appointments, Remuneration & Governance Committee on the date of filing of the Universal Registration Document:

Members of the Appointments, Remuneration & Governance Committee		
Colette Lewiner	Chair	Independent director appointed by the Shareholders' Meeting
Karine Granger	Member	Director elected by the employees
Claire Pedini	Member	Independent director appointed by the Shareholders' Meeting
Martin Vial	Member	Representative of the French State.

Number of members	4
Number of independent directors	2
Percentage of independent directors*	66.67%

* *Excluding directors representing the employees.*

Duties

In terms of appointments, the Committee submits its recommendations or proposals to the Board of Directors regarding the appointment of directors by the Shareholders' Meeting. It supervises the selection process of potential candidates and may perform its own review of the candidates. It proposes to the Board the definition and updating of a diversity policy applied to directors. It monitors the implementation of the policy and the results achieved. The Committee ensures the existence of succession plans in order to anticipate the succession, whether unforeseen or at the end of their term, of executive corporate officers and members of the Group's Executive Committee. The Chairman & Chief Executive Officer is involved in the Committee's work in the performance of this task, except with respect to work regarding his or her own succession.

With regard to remuneration, the Committee examines and gives an opinion on the corporate officer remuneration policy referred to in Article L. 22-10-8 of the French Commercial Code and on the principles and criteria used to determine and distribute all the factors comprising the Chairman & Chief Executive Officer's remuneration and benefits of all kinds. It submits this opinion to the Board for deliberation. The Chairman of the Committee also submits this opinion for approval to the French Minister for the Economy. The Committee prepares its proposals within the limits specified by Decree no. 2012-915 of 26 July 2012, which amended the Decree of 9 August 1953, relating to French State control of the compensation of the executives of public companies, in accordance with which the Chairman & Chief Executive's annual compensation must not exceed the gross sum of €450,000. The Committee submits to the Board its opinion on the remuneration policy of the Group's Executive Committee and the main executives, as well as on the amount and terms and conditions for the distribution of the sum set by the Shareholders' Meeting to be allocated to the directors in return for their duties.

In terms of governance, the Committee oversees issues relating to corporate governance and ensures the implementation, within the Company's corporate bodies, of the principles and rules outlined in the AFEP-MEDEF Code. It may make proposals concerning changes in the functioning or powers of the Board or its internal rules of procedure. Every year, it conducts a review of the functioning of the Board and its Committees and every three years supervises the formal evaluation conducted by an independent external consultant. Each year, the Committee examines the individual situations of the directors in accordance with the independance criteria defined by the AFEP-MEDEF Code and reports its findings to the Board. In the event of appointment of new members to the Audit Committee, it examines these members' expertise in the field of finance, accounting and statutory audit. It examines and gives its opinion on situations of conflicts of interest of which it has become aware or which are reported to it and reports such situations to the Board.

Activity in 2020

	2020	2019
Number of meetings	4	9
Average attendance rate	100%	86.1%
Average duration of the meetings	1 hour and 22 minutes	24 minutes

In 2020, the Committee reviewed the remuneration policy for corporate officers (Chairman and Chief Executive Officer and directors) submitted to the Shareholders' Meeting of 7 May 2020 pursuant to Article L. 22-10-8 of the French Commercial Code and the remuneration policy for EDF group executives, the individual situation of Directors with regard to the independence criteria of the AFEP-MEDEF Code, the proposal to renew the term of office of one Director (see section 4.2.1 "Members of the Board of Directors"), the governance elements of the 2019 management report, the EDF group's Talents policy and the training and development arrangements for senior executives, the proposal to appoint a Climate point person within the Board of Directors (see section 4.2.3.4 "Corporate Responsibility Committee"), the choice of the independent firm in charge of the external evaluation of the Board and its Committees and the assessment of its work prior to its presentation to the Board of Directors. At the beginning of 2021, the Committee reviewed the succession plan for all Executive Committee members.

The Committee did not need to seek any external technical advice or order any studies on issues falling within its remit during the 2020 fiscal year.

4.3 Executive Management

The Chairman & Chief Executive Officer is assisted by an Executive Committee which includes representatives of all the Group's lines of business.

This Committee is a body that makes decisions on, considers and discusses the Group's operational and strategic issues. It examines all the Group's significant underlying and current issues, tracks the operating objectives and results and contributes to the management and forecasting of the EDF group's major challenges. It reviews and authorises significant projects, specifically the Group's investment or divestment projects for amounts which exceed certain thresholds, in accordance, where appropriate, with the governance of the Group's listed subsidiaries. In principle, the Executive Committee meets each week.

In order to reinforce the examination and follow-up of projects, an Executive Committee Commitments Committee examines in-depth the most significant projects in terms of level of commitments or risks incurred before the Executive Committee makes its decision. No investment project may be submitted for review by the Board of Directors without having first been approved by this Committee.

On the date of filing of this Universal Registration Document, the Executive Committee comprised thirteen members and a Secretary. The list of members and their personal information appear below.

4.3.1 Members of the Executive Committee

On the filing date of this Universal Registration Document, the members of the Executive Committee were as follows:

Names	Duties
Jean-Bernard Lévy	Chairman & Chief Executive Officer
Marc Benayoun	Group Senior Executive Vice-President, Customers, Services and Regions. He oversees Edison and gas activities
Bruno Bensasson	Group Senior Executive Vice-President, Renewable Energies, Chairman & Chief Executive Officer of EDF Renewables
Béatrice Buffon	Group Senior Executive Vice-President, International Division [(1)]
Christophe Carval	Group Senior Executive Vice-President, Group Human Resources
Xavier Girre	Group Senior Executive Vice-President, Group Finance
Véronique Lacour	Group Senior Executive Vice-President, Transformation and Operational Effectiveness
Cédric Lewandowski	Group Senior Executive Vice-President, Nuclear and Thermal
Alexandre Perra	Group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy
Simone Rossi	Group Senior Executive Vice-President, Chief Executive Officer of EDF Energy
Alain Tranzer	General Representative for Industrial Quality and Nuclear Skills [(2)]
Pierre Todorov	Group Senior Executive Vice-President, Group General Secretary
Xavier Ursat	Group Senior Executive Vice-President, New Nuclear Projects and Engineering

Paul-Marie Dubée is the Secretary of the Executive Committee. He is Executive Coordinator, Government Relations.

(1) Béatrice Buffon replaced Marianne Laigneau from 10 February 2020.
(2) Alain Tranzer took office in April 2020.

4.3.2 Personal information on members of the Executive Committee

Marc Benayoun, 54 years old, a graduate of the École supérieure des sciences économiques et commerciales (ESSEC), began his career at Paribas Group in 1989, before joining the Boston Consulting Group in 1993. He became Partner and Managing Director at the Paris office in 2001 then at the Moscow office in 2008 and during this period held a range of responsibilities, including the development of skills within the Company in the natural gas sector. In 2009, he joined the EDF group as Economics, Tariffs and Prices Director, at the Commerce Division He was notably in charge of discussions related to changes in the French regulated electricity tariffs. In 2012, he became Director, Business Customers Market. In this role, he managed the project to end regulated electricity tariffs for companies and local communities, which resulted in EDF regaining its leadership position in a competitive environment. In 2016, Marc BENAYOUN was appointed Member of the Executive Committee of the EDF group, Gas and Italy. As such, he served as Chief Executive Officer of Edison, the third-largest Italian energy company. He also oversaw gas procurement activities for the EDF group, and managed its portfolio of long-term contracts for the transport of natural gas by pipeline and by sea (liquefied gas), as well as the assets needed to transport the gas to the delivery points. Since July 2019, Marc BENAYOUN is Group Senior Executive Vice-President, Customers, Services and Regions. In this capacity, he is heading the Commerce Division and supervises energy services related entities, including Dalkia. He is also a member of the EDF Trading Board of Directors, Chairman of the Edison Board of Directors and supervises EDF group gas procurement platform based in Italy.

Bruno Bensasson, 48 years old, is a graduate of the École Polytechnique and École des Mines of Paris. He began his career in 1998 at the ASN (*i.e.* French nuclear security authority) as head of a Regional Division (Lower and Upper Normandy) then as the Chief of Staff of the CEO. From 2004 to 2006, he was the technical adviser responsible for the environment, new energies and nuclear energy at the office of the French Minister for Industry, then technical adviser at the General Secretariat of the office of the President of the French Republic in charge of industry, the environment and transport. He joined SUEZ in 2007 as Director of Economic Studies at the Department of Development and Strategy. In 2011, he became a member of GDF SUEZ's Executive Committee as Director for Strategy and Sustainable Development. He was appointed CEO of GDF SUEZ Energie France in early 2013 and, in July 2014, became the Vice-President of GDF SUEZ Energie Europe in charge of development and renewable generation. Since 2016, he has been the CEO of Energie Afrique. In May 2018, Bruno Bensasson became the EDF group Senior Executive Vice-President responsible for Renewable Energies and the Chairman & Chief Executive Officer of EDF Renewables. He is a Director of Luminus and EDF Trading.

Béatrice Buffon, 46 years old, is a graduate from both the École Polytechnique and the École nationale des ponts et chaussées. She began her career as Finance Manager at COGETHERM, an EDF subsidiary specialized in the development of Combined Heat and Power (CHP) projects. In 2001, she joined SIIF Energies, which later became EDF Renewables, where she would take up office as Project Director in 2003. From 2007 to 2009, she undertook the functions of Deputy Executive Director of POWEO Energies Renewables. She returned to EDF Renewables in 2010 as Director of Development for large-scale, ground-mounted solar power projects; then in 2011, she became Director of Development for Offshore Wind Power France. In 2014, Béatrice Buffon became Executive Vice-President of EDF Renewables, in charge of renewable marine energies and a member of the EDF Renewables Executive Committee. She is a chevalier de l'Ordre national du mérite. Since February 2020, she has been Group Executive Director in charge of EDF's International Division.

Christophe Carval, 60 years old, holds a degree in electrical engineering from HEI Lille engineering school, and joined the EDF group in 1982. He has held several management positions in Departmental, Regional and Inter-regional Units in the electricity and gas distribution sector. In 2007, he was appointed to head up the project to create then manage the new Shared Services Division of the EDF group, aiming at rationalising and professionalising this Division. He was the Director of Human Resources, Health & Safety and the Enedis Transformation project from 2014. In this capacity, he has notably led projects to simplify the Company's structure into 25 Regional Divisions and to overhaul its governance system. Since July 2017, he has held the position of Group Senior Executive Vice-President, Human Resources Division. He is also Chairman of the Supervisory Board of Enedis and a member of the Supervisory Boards of RTE, CTE, Framatome and EDF Energy.

Xavier Girre, 52 years old, graduated HEC business school, is the holder of a Master's degree in Business Law, a graduate of IEP (*i.e.* Paris Institute of Political Studies) and is an ENA (*i.e.* French National School of Administration) alumnus. Xavier Girre began his career at the French National Audit Office in 1995, before joining the Veolia group in 1999 where he spent twelve years and notably held the positions of Group Risk and Auditing Director of Veolia Group, Deputy Chief Executive Officer in charge of Finance of Veolia Transportation then of Veolia Environmental Services. From 2011 to 2015, he was COO, Chief Financial Officer of La Poste group and then Chairman of the XAnge Private Equity Supervisory Board. Xavier Girre joined EDF in 2015 as France Chief Financial Officer, before being appointed to the EDF Executive Committee. He is also Director of EDF Energy, EDF Renewables, Dalkia, Edison, Chairman of the Board of Directors of EDF Trading, a member of the Supervisory Board of Enedis, Chief Executive Officer of CTE, and Chairman of the Supervisory Board of RTE. Xavier Girre is also Director and Chairman of the Audit Committee of La Française des Jeux. Il is also an independent director of CNIM. Since March 2016, he has been Group Senior Executive Vice-President, Finance

Véronique Lacour, 56 years old, holds a postgraduate diploma in information systems from the University of Paris I Panthéon Sorbonne. Véronique Lacour began her career at Thales in 1987, where she gained solid experience in information systems, before taking up the position of Chief Information Officer for a new Division of Thales in 2004. Between 2007 and 2009, she managed the HR Information Systems Shared Services of such Division. She moved to Safran in 2009 where she held the position, first, of Chief Information Officer for Safran Aircraft Engines (formerly Snecma), and later, in 2013, Vice-President Improvement Initiatives, where she managed continuous improvement and transformation initiatives. She went on to become Vice-President Programs for Safran Analytics, and was involved in the creation of this new Big Data-focused entity as part of the Group's digital transformation strategy. Véronique Lacour joined EDF's Executive Committee on 1 December 2016, tasked with directing the Group's activities in the areas of information systems, purchasing, property, consultancy, shared tertiary services and IT. Since 2016, she has been Group Senior Executive Vice-President, Transformation and Operational Effectiveness

Cédric Lewandowski, 51 years old, is a graduate of the Paris Institute of Political Studies (IEP) and holds a postgraduate degree (DEA) in Geopolitics (Paris-VIII). Cédric Lewandowski began his career at EDF in 1998 as the Chief of Staff for the Chairman of EDF from 1998 to 2004, he then served as Director of the Electric Transport and Vehicles Division of Électricité de France from 2005 to 2008. He subsequently became Director of EDF Regional Authorities within EDF's Commerce Division from 2008 to 2012, Chairman of the Board of Directors of H4 from 2009 to 2012, Director of Safidi from 2009 to 2012 and Chairman of the Board of Directors of Tiru from 2009 to 2012. He was then appointed Chief of Staff of the Civil and Military Cabinet of the French Ministry of Defence from May 2012 until mid-2017. He held the position of EDF group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy from 2017 to 2019. He is Chairman of the Board of Directors of ÉS (Électricité de Strasbourg) and Governor of WANO's Main Governing Board. He has been Group Senior Executive Vice-President, Nuclear and Thermal since July 2019.

Alexandre Perra, 40 years old, is a graduate of the Institut d'études politiques de Paris and holds a Master's degree in Modern Literature. He joined Thales in 2007, firstly working at the Strategy Department, before becoming Head of Group International Communications, then of Media Relations and finally being appointed Deputy Director of Group Communications. Alexandre Perra joined EDF in November 2014 as Executive Director attached to the Chairman and CEO of EDF, Secretary of the Executive Committee in charge of governmental relations. He took part in the definition of the CAP 2030 company strategy, first implemented in 2015. In 2017, he launched project Y, which mobilises young employees under the age of 35 to accelerate EDF's digital transformation. In 2018, he presided over the work to draw up the Group's Storage Plan, which he continues to lead. He is a member of the Supervisory Board of Enedis, a member of the Board of Directors of the EDF Foundation and Regional Vice-Chair Europe of the World Energy Council. He has held the position of EDF group Senior Executive Vice-President, Innovation, Corporate Responsibility and Strategy since July 2019.

Simone Rossi, 52 years old, a graduate of the University of Bocconi (Milan) in Business Administration. Simone Rossi began his career as a consultant, firstly at KPMG Consulting in corporate finance, then from 1996 at McKinsey & Company, where he mainly specialised in the sectors of energy, financial institutions, and information and communication technologies. In 2004, he joined Edison SpA in Milan (Italy) as Head of Strategy, before being promoted to become Director of Financial Control and Information Systems in 2007. At the end of 2009, he was appointed Chief Financial Officer of Constellation Energy Nuclear Group (CENG), a company based in Baltimore in the United States. He then became Chief Financial Officer of EDF Energy in April 2011. In March 2015, Simone Rossi was appointed EDF group Senior Executive Vice-President, International Division. Since 1 November 2017, he has been the Chief Executive Officer of EDF Energy and Group Senior Executive Vice-President of EDF.

Pierre Todorov, 62 years old, a graduate of the École normale supérieure (Ulm) and the École nationale d'administration (ENA) and holder of an advanced teaching degree in Philosophy. Pierre Todorov was an auditor then Counsel at the French Council of State from 1986 to 1990. He then joined the Lagardère Group, where he held a range of responsibilities in the media branch, particularly serving as International Deputy Chief Executive Officer of Hachette Filipacchi. In 1997, he was appointed General Secretary of Accor Group, a position he held until 2008. Between 2008 and 2011, he was partner at the law firm Hogan Lovells LLP, and then joined PSA Peugeot Citroën in 2011 as General Secretary, member of the Executive Management Committee. Pierre Todorov has been EDF group General Secretary and a member of the Executive Committee since February 2015.

Alain Tranzer, 54 years old, is a graduate engineer of the École Polytechnique and École des Mines of Paris. He began his career in 1991 with the PSA Group. After a period in ground liaison engineering, he successively held the positions of Sub-system Manager, Plant Quality Director, and Chief Engineer for the Peugeot 407, then Director of the Peugeot 208-2008 programme. He has thus acquired solid experience in the management of industrial projects, from design to industrialisation, and was awarded the Eurostar 2013 Project Leader of the Year prize by Automotive News Europe. In 2013, Alain Tranzer became responsible for the PSA Group's preliminary projects, the modular policy and complex projects involving autonomous, connected, electric and hybrid electric vehicles. From 2018 to 2020, he was Senior Vice-President of the PSA Group, in charge of the CO_2 programme and associated platforms and technological modules. In March 2020, he joined the EDF group to steer the implementation of the "Excell" plan, which aims to strengthen the industrial quality, skills and governance of major nuclear projects, and was appointed General Representative for Industrial Quality and Nuclear Skills. He is a member of EDF Executive Committee.

Xavier Ursat, 54 years, a graduate of the École Polytechnique and Télécom Paris. He joined EDF in 1991, first holding various positions in the hydraulic engineering department until 2002. He oversaw the construction of EDF's hydraulic engineering centres and contributed to international projects, especially in South America. From 2002 to 2005, he was a special advisor to EDF's Senior Executive Vice-President, Generation and Engineering. From 2005 to 2007, he was Assistant Director of the Alps Generation Unit in Grenoble and from 2007 to 2010, Director of the Southwest Generation Unit in Toulouse. From 2010 to 2015, he was successively Deputy Manager and Manager of the Hydraulic Generation & Engineering Division. He is Chairman of GIFEN (Groupement des industriels français de l'énergie Nucléaire [the French Nuclear Energy Industry Group]), as well as Chairman of the Supervisory & Steering Committee of Edvance, and a member of the Supervisory & Steering Board of Framatome. He is also Chairman of the French Nuclear Energy Society (SFEN) and Honorary Governor of the World Water Council. Since March 2015, Xavier Ursat has been Group Senior Executive Vice-President, New Nuclear Projects and Engineering.

4.4 Conflicts of interest and interests of corporate officers and executives

4.4.1 Conflicts of interest

To the Company's knowledge, on the date of filing of this Universal Registration Document, there were no potential conflicts of interest involving EDF between the duties of the members of the Company's Board of Directors and Executive Management and their private interests or other duties (regarding the rules applicable to the members of the Board of Directors in terms of conflicts of interest, see section 4.2.2.7 "Obligations and duties of Directors").

Subject to the specific legal and regulatory provisions applicable to the membership of the Company's Board of Directors (see section 4.2.1 "Members of the Board of Directors"), to the Company's knowledge, no arrangements or agreements have been entered into with shareholders, clients, suppliers or others under which a member of the Board of Directors or Executive Management has been appointed in this capacity.

To the Company's knowledge, no member of the Board of Directors has agreed to restrict for a fixed period of time his or her ability to sell his or her holdings in the Company's capital, except for the restrictions resulting from the EDF Stock Exchange code of ethics (see section 4.5.2 "Trading in Company securities"). In addition, corporate officers holding shares in mutual funds through the EDF group Corporate Savings Plan invested in EDF shares, or who have acquired shares from the French State within the legal framework of the privatisation, can be subject to the lock-in and non-transferability rules resulting from the provisions applicable to these transactions.

To EDF's knowledge, there are, moreover, no family ties between members of the administrative bodies or Executive Management.

4.4.2 Absence of conviction

To EDF's knowledge, no member of the EDF Board of Directors or Executive Management has been subject to a conviction for fraud, or bankruptcy proceedings, receivership, liquidation or court-ordered administration during the past five years.

Following an investigation initiated by the Autorité des marchés financiers (AMF) (French Financial Markets Authority) in July 2016 into EDF's financial reporting since 1 July 2013, the AMF Board notified the Chairman and Chief Executive Officer of EDF of grievances on 5 April 2019. Jean-Bernard Lévy was cleared by a decision of the AMF Enforcement Committee on 28 July 2020, with this decision being final in this matter (see section 7.1.5 "Disputes"). Michèle Rousseau was also fined by the Court of Budgetary and Financial Discipline on 4 September 2018 for having, in her capacity as Chief Executive Officer of the Seine-Normandy Water Agency, granted aid, which was deemed to be irregular, to a water treatment plant. To the best of EDF's knowledge, no other Director has been subject to any official public accusation or sanction issued by statutory or regulatory authorities during the last five years.

Moreover, to EDF's knowledge, no member of the EDF Board of Directors or Executive Management has been prevented by a Court from serving as a member of an administrative, management or supervisory body of an issuer or from participating in the management or direction of an issuer's affairs during the past five years.

4.4.3 Service contracts

EDF's corporate officers did not enter into any service contract with the Company or any of its subsidiaries pursuant to which they would be entitled to any kind of benefits.

4.5 Shareholding by corporate officers and trading in EDF securities by corporate officers and executives

4.5.1 Shareholding in EDF by directors

As at 31 December 2020, the members of the Board of Directors of the Company, whose terms of office are ongoing as at 31 December 2020, held a total of 6,722 shares. The table below details the number of EDF shares held individually by these directors on 31 December 2019 and 31 December 2020:

	Number of EDF shares held on 31/12/2020	Number of EDF shares held on 31/12/2019
Jacky Chorin (1)	316	294
Karine Granger	25	25
Colette Lewiner (2)	1,969	1,929
Laurence Parisot	137	137
Philippe Petitcolin	10	10
Vincent Rodet (2)	2,905	1,873
Christian Taxil (1)	1,360	1,263
TOTAL	**6,722**	**5,531**

n/a: not applicable.

(1) Shares held through a profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).
(2) Shares held directly and through a profit-sharing scheme (FCPE) (amount rounded down to the nearest unit).

Directors whose terms of office are ongoing on 31 December 2020 and are not included in the above table, hold no EDF shares.

4.5.2 Trading in Company securities

In 2006, the EDF group adopted a set of principles and rules applicable to trading in shares in EDF or listed EDF group subsidiaries. These rules were compiled into a code of ethics. This code was updated in 2016 to take account of the entry into force of regulation (EU) no. 596/2014 on market abuse (so-called "MAR" – market abuse regulation), its implementing regulations [(1)], law no. 2016/819 of 21 June 2016 reforming the system for the repression of market abuse and the new Guide on ongoing information and the management of inside information published by the AMF on 26 October 2016.

At the same time as this Code was distributed, awareness campaigns on stock exchange rules were launched for Group employees, specifically regarding precautions and obligations relating to the holding of inside information and the black-out periods during which permanent or temporary insiders, including third parties acting in the name or on behalf of the Group, and, more specifically regarding black-out periods, all persons performing executive duties within the Group, are required to refrain from trading Company securities or other related financial instruments.

The code of ethics also notes the obligations imposed on executives, high-level managers as well as persons closely linked to them to declare to the AMF and to the Company trades in EDF securities or other related financial instruments that they make on their own behalf. Indeed, under the terms of Article 19 of MAR, specified in Article 223–22 A of the AMF general regulations, the executives of companies with shares listed for trading on a regulated market must declare trades in Company securities to the AMF and to the Company within three working days of their completion, when the combined amount of these trades exceeds the sum of €20,000 for the current calendar year.

Pursuant to the AMF general regulations [(2)], the EDF Board of Directors must mention in its annual report to the Shareholders' Meeting trades that have been declared by executives and similar persons [(3)] over the past fiscal year.

No trades in EDF securities were declared to the AMF or to the Company during the 2020 fiscal year by the members of the Board of Directors and the Company's Executive Committee.

4.6 Remuneration and benefits of corporate officers – Remuneration policy

As indicated in section 4.1 ("Corporate Governance Code"), the Company adheres to the AFEP-MEDEF Code subject to the specific legislative and regulatory requirements applicable to it.

This section provides details of the total remuneration and benefits of any kind paid during the fiscal years 2019 and 2020 or granted in respect of the same fiscal years to the corporate officers by the Company and the companies included in the Company's consolidation scope within the meaning of Article L. 233-16 of the French Commercial Code (see section 4.6.2 for the Chairman and Chief Executive Officer and section 4.6.3 for the directors). The tables in sections 4.6.2 and 4.6.3 below were drawn up in accordance with the format recommended by the AFEP-MEDEF Code of Corporate Governance and the AMF's position-recommendation no. 2021-02.

Pursuant to Article L. 22-10-8 of the French Commercial Code, this section also presents the policy for the remuneration of corporate officers established by the Board of Directors (see section 4.6.1 below), which shall be submitted to the Shareholder's Meeting to be held on 6 May 2021.

4.6.1 Remuneration policy

Pursuant to Article L. 22-10-8 of the French Commercial Code, the Board of Directors establishes the remuneration policy for corporate officers.

In accordance with Article 22-10-16 and Article 22-10-17 of the French Commercial Code, the items comprising the remuneration of the Chairman & Chief Executive Officer are set by the Company's Board of Directors on the recommendation from the Appointments, Remuneration & Governance Committee and submitted for approval by the French Minister for the Economy after the consultation of the relevant Ministers (see section 4.2.3.5 "Appointments, Remuneration & Governance Committee"). The remuneration of the Chairman and Chief Executive Officer must comply with the limits provided for by Decree no. 2012-915 of 26 July 2012 on State control over the remuneration of executives of public companies, which amended the Decree of 9 August 1953 and sets a ceiling on his remuneration of €450,000 gross.

The Appointments, Remuneration and Governance Committee also issued its opinion to the Board regarding the rules and procedures for allocating the sum set by the Shareholder's Meeting pursuant to Article L. 225-45 of the French Commercial Code, to be allocated to Directors as a remuneration for their work.

At the Shareholders' Meeting of 7 May 2020, the five resolutions submitted to the shareholders' vote on the remuneration and the remuneration policy for EDF's directors and Officers (from the 13th to the 17th resolution) were adopted by a very large majority, with more than 99.9% of votes in favour.

(1) Delegated regulation (EU) 2016/522 of 17 December 2015 as regards the indicators of market manipulation, the disclosure thresholds, the permission for trading duringclosed periods and types of notifiable managers' transactions; delegated regulation (EU) 2016/908 of 26 February 2016 with regard to accepted market practices; delegatedregulation (EU) 2016/909 of 1 March 2016 with regard to notifications and lists of financial instruments to be submitted to competent authorities in accordance with Article 4of MAR; delegated regulation (EU) 2016/1052 of 8 March 2016 with regard to the conditions applicable to buy-back programmes and stabilisation measures; delegatedregulation (EU) 2016/957 of 9 March 2016 with regard to abusive practices or suspicious orders or transactions; delegated regulation (EU) 2016/958 of 9 March 2016 withregard to technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy andfor disclosure of particular interests or indications of conflicts of interest; delegated regulation (EU) 2016/960 of 17 May 2016 with regard to market soundings; implementingregulation (EU) 2016/347 of 10 March 2016 regarding insider lists; commission implementing regulation (EU) 2016/523 of 10 March 2016 with regard to managers' transactions; implementing regulation (EU) 2016/378 of 11 March 2016 laying down implementing technical standards with regard to the timing, format and template of thesubmission of notifications according to Article 4 of MAR; implementing regulation (EU) 2016/959 of 17 May 2016 relating to market soundings; implementing regulation(EU) 2016/1055 of 29 June 2016 with regard to the technical means for appropriate public disclosure of inside information and for delaying the public disclosure of insideinformation.

(2) Article 223–26 of the AMF general regulations.

(3) At EDF, staff "similar to executives" are the members of the Company's Executive Committee.

4.6.1.1 Remuneration policy applicable to the Chairman and Chief Executive Officer

After consulting the Appointments, Remuneration and Governance Committee which met on 9 February 2021, the Board of Directors approved at its meeting on 17 February 2021 the remuneration policy described below for the Chairman and Chief Executive Officer:

Components of the remuneration	Amounts paid during the 2020 fiscal year	Amounts allocated for the 2020 fiscal year	Policy for the fiscal year 2021
Fixed remuneration	€450,000	€450,000	On recommendation from the Committee, the Board which met on 17 February 2021 decided to maintain the fixed annual remuneration of the Chairman and Chief Executive Officer for the 2021 fiscal year at €450,000 gross. This fixed annual remuneration, which corresponds to the ceiling provided for by the Decree of 9 August 1953, has remained unchanged since Mr Lévy's appointment as Chairman and Chief Executive Officer of EDF in 2014.
Variable remuneration	none	none	none
Multi-year variable remuneration	none	none	none
Possibility of deferring or repaying the variable remuneration	n/a	n/a	n/a
Exceptional remuneration	none	none	none
Stock options, performance shares or other long-term benefits	none	none	none
Remuneration for serving as a Director	n/a	n/a	The Chairman & Chief Executive Officer does not receive any remuneration for his or her term of office as Director.
All types of benefits	3,660	3,660	Benefit corresponding to the provision of a company car that the Board has decided to maintain for the 2021 fiscal year.
Signing allowance	none	none	none
Severance pay or end-of-service allowance	none	none	none
Non-competition clause	none	none	none
Supplementary pension scheme	none	none	none
Remuneration paid or granted by a company included in the scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code	none	none	none

n/a: not applicable.

As the remuneration of the Chairman and Chief Executive Officer is set at the ceiling set by the decree of 9 August 1953 and does not include a variable portion, its determination is not based on criteria related to the Company's performance.

Ratio of equity [1] and changes in remuneration 2017-2020

In accordance with Article L. 22-10-9 of the French Commercial Code, the table below shows the change over the past five years in the ratio between the level of remuneration of the Chairman and Chief Executive Officer and the average remuneration on a full-time equivalent basis of EDF SA [2] employees (other than corporate officers and the Chairman and Chief Executive Officer), and the ratio between the level of remuneration of the Chairman and Chief Executive Officer and the median remuneration on a full-time equivalent basis of EDF employees [2] (other than corporate officers and the Chairman and Chief Executive Officer), as well as the organic changes in Group EBITDA over the same period.

	2020	2019	2018	2017	2016
Remuneration of the Chairman and CEO [1]	453,660	453,660	452,868	452,868	452,868
Changes in the remuneration of the Chairman and Chief Executive Officer [2]	0%	0.2%	0%	0%	0%
Equity ratio/Average remuneration [3]	6.6	6.8	7.1	7.1	7.2
Equity ratio/Median remuneration [3]	7.2	7.4	7.7	7.9	8.0
Changes in average salary [2]	2.87%	3.66%	0.98%	1.43%	3.37%
Changes in median salary [2]	3.54%	4.16%	1.81%	2.07%	3.27%
Organic changes in the Group EBITDA [2]	-2.70%	8.40%	11.30%	-14.80%	-4.80%

(1) The total remuneration of the Chairman and Chief Executive Officer includes his fixed salary and benefits in kind.
(2) Change observed in year N compared to year N-1.
(3) Salaries include the fixed salary, the variable portion and all bonuses, including those related to the status of the IEGs, as well as any benefits in kind.

4.6.1.2 Remuneration policy applicable to Directors

After receiving the opinion of the Appointments, Remuneration and Governance Committee at its meeting held on 9 February 2021, the Board of Directors, at its meeting held on 17 February 2021, approved the remuneration policy described below concerning the amount and distribution among the directors of the sums paid to them in respect of their office pursuant to Article L. 22-10-14 of the French Commercial Code

Budget and breakdown of remuneration paid to Directors in respect of their office

The directors representing the employees hold office without remuneration in accordance with law no. 83-675 of 26 July 1983 concerning the democratisation of the public sector, and the Chairman & Chief Executive Officer receives no remuneration for his or her term of office as a director.

Pursuant to Order no. 2014-948 of 20 August 2014, the remuneration granted, in respect of their office, to Directors appointed by the General Meeting upon proposal from the French State in accordance with Article 6 of the Order, and who are civil servants of the State, shall be paid in full to the State budget.

As regards other directors appointed by the Shareholders' Meeting on recommendation from the French State and who are not civil servants, an Order of the French Minister for the Economy and Finance dated 5 January 2018 [3] states that the Company pays into the French State budget 15% of the remuneration allocated to them for their term of office, with the remaining 85% paid to the Director.

Regarding the Representative of the French State appointed in accordance with Article 4 of the Order of 20 August 2014, any remuneration that he/she is entitled to receive for the performance of his/her duties is paid to the State budget.

After receiving the opinion of the Appointments, Remuneration and Governance Committee, the Board of Directors submits to the General Meeting of Shareholders for approval a fixed annual sum to be allocated to the directors in accordance with the allocation rules defined by the Board and presented in this Remuneration Policy. The Board met on 17 February 2021 and decided to submit to the General Meeting convened on 6 May 2021 an annual budget of €440,000 for fiscal year 2021.

The terms and conditions for the distribution of this annual budget, applicable since the 2011 fiscal year, were re-examined and confirmed by the Board of Directors on 17 February 2021. The total budget is distributed between a fixed portion and a variable portion, each representing half of the budget, distributed as follows:

- the fixed portion is shared equally among the directors in question; 50% of the fixed annual portion is paid during the fiscal year, in which it is allocated and the remaining 50% at the beginning of the following fiscal year;
- the distribution of the variable portion among the directors is established through the application of a variable coefficient depending on the type of meeting (Board or Committee) and depending on the particular positions held by each Director (committee member or Chairman): a coefficient of 2 for the attendance of a Director at a meeting of the Board of Directors, a coefficient of 1 for the attendance of a Director as a member at a Committee meeting and a coefficient of 2 for chairmanship of a Committee. The variable portion is divided by the total of the coefficients for the fiscal year in order to determine the unit value of the coefficient; the variable portion for a fiscal year is fully paid at the start of the following fiscal year.

It is not planned to pay any exceptional remuneration or other remuneration to the directors during fiscal year 2021 by the Company or by a company included in the Company's scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code.

(1) Ratios were established in accordance with guidelines published by the AFEP.
(2) i.e. more than 60,000 employees.
(3) The provisions of the order of 5 January 2018, amending the order of 18 December 2014 in accordance with Article 6-V of the order dated 20 August 2014, have beenapplicable since 1 February 2018. Prior to that, the Order of 18 December 2014 provided that the remuneration to be earned by these directors was paid to the tune of 30%to the directors in question, with the remaining 70% paid into the French state budget.

4.6.2 Total remuneration of the Chairman & Chief Executive Officer

4.6.2.1 Remuneration of the Chairman & Chief Executive Officer

SUMMARY TABLE OF REMUNERATION AND OPTIONS AND SHARES ALLOCATED TO THE CHAIRMAN & CHIEF EXECUTIVE OFFICER – AMF TABLE NO. 1 (1)

(in euros)	2020 fiscal year	2019 fiscal year
Jean-Bernard Lévy, Chairman & Chief Executive Officer		
Remuneration allocated for the fiscal year (see details in table no. 2)	453,660	453,660
Valuation of multi-year variable remuneration allocated during the fiscal year	none	none
Valuation of options allocated during the fiscal year (2)	none	none
Valuation of bonus shares allocated during the fiscal year (2)	none	none
TOTAL	**453,660**	**453,660**

(1) Table 1 of AMF position-recommendation no. 2021-02.
(2) As indicated in section 4.6.4, the Company has not implemented any stock options plans and the corporate officers receive no allocation of bonus shares.

The table below details the remuneration of all kinds paid to Jean-Bernard Lévy, Chairman & Chief Executive Officer, during the 2019 and 2020 fiscal years or owed for the 2019 and 2020 fiscal years.

SUMMARY TABLE OF THE REMUNERATION OF THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER – AMF TABLE NO. 2 (1)

	2020 fiscal year		2019 fiscal year	
(in euros)	Amounts due for the fiscal year	Amounts paid during the fiscal year	Amounts due for the fiscal year	Amounts paid during the fiscal year
Jean-Bernard Lévy, Chairman & Chief Executive Officer				
Fixed remuneration	450,000	450,000	450,000	450,000
Variable remuneration	none	none	none	none
Multi-year variable remuneration	none	none	none	none
Exceptional remuneration	none	none	none	none
Remuneration of the office of Director	none	none	none	none
Benefits in kind (2)	3,660	3,660	3,660	3,660
TOTAL	**453,660**	**453,660**	**453,660**	**453,660**

(1) Table 2 of AMF position-recommendation no. 2021-02.
(2) This benefit corresponds to the provision of a company car.

4.6.2.2 Setting of the remuneration of the Chairman & Chief Executive Officer

Remuneration for the 2020 fiscal year

The Appointments, Remuneration & Governance Committee meeting of 7 February 2020 reviewed the policy regarding remuneration of the Chairman & Chief Executive Officer and decided to recommend to the Board of Directors that the principles and criteria for the determination of items comprising his remuneration be maintained for the 2020 fiscal year.

On recommendation from the Committee, the Board which met on 13 February 2020 decided to maintain the fixed annual remuneration of the Chairman and Chief Executive Officer for the 2020 fiscal year at €450,000 gross. The remuneration of the Chairman and Chief Executive Officer also includes benefits in kind corresponding to the provision of a company car.

Remuneration for the 2021 fiscal year

The Appointments, Remuneration & Governance Committee meeting of 9 February 2021 reviewed the policy regarding remuneration of the Chairman & Chief Executive Officer and decided to recommend to the Board of Directors that the principles and criteria for the determination of items comprising his remuneration be maintained for the 2021 fiscal year.

On recommendation from the Committee, the Board which met on 17 February 2021 decided to maintain the fixed annual remuneration of the Chairman and Chief Executive Officer for the 2021 fiscal year at €450,000 gross. The remuneration of the Chairman and Chief Executive Officer also includes benefits in kind corresponding to the provision of a company car.

4.6.2.3 Other items of compensation

In 2020, Mr Jean-Bernard Lévy did not receive any remuneration for his duties as Director and Chairman of the Board of Directors of EDF. He also did not receive any remuneration for the positions held in companies controlled by EDF, or any remuneration of any kind whatsoever from the companies it controls.

The Company allocated no stock options to the Chairman & Chief Executive Officer in 2020 and no options were exercised during the fiscal year. Similarly, no bonus shares were allocated free of charge to the Chairman & Chief Executive Officer during the past fiscal year, and none became available.

Mr Jean-Bernard Lévy did not receive any hiring bonus from EDF.

He does not benefit from any indemnities or benefits due or liable to be due for termination or modification of duties, nor from non-competition clause compensation, and has no employment contract or supplementary pension plan.

SUMMARY TABLE OF EMPLOYMENT CONTRACT, SUPPLEMENTARY PENSION, SEVERANCE PAYMENTS AND NON-COMPETITION CLAUSE – *AMF TABLE AMF NO. 11* [1]

Chairman and Chief Executive Officer*	Employment contract	Supplementary pension plan	Compensation or benefits due or liable to be due for termination or modification of duties	Non-competition clause compensation
Jean-Bernard Lévy, Chairman & Chief Executive Officer	no	no	no	no

(1) Table 11 of AMF position-recommendation no. 2009-16.

4.6.3 Total remuneration of directors

Remuneration allocated and paid to directors in 2020

The Shareholders' Meeting convened on 7 May 2020 approved, on the proposal of the Board of Directors, a fixed annual sum to be allocated to the directors as remuneration for their term of office of €440,000 for the fiscal year 2020.

The terms and conditions for allocating this amount, which are reviewed annually by the Board of Directors when the remuneration policy for corporate officers is approved, have remained unchanged since fiscal year 2011 (see details in section 4.6.1.2 "Remuneration policy applicable to Directors").

Directors elected by employees, who do not receive remuneration for their duties as directors, receive fixed and/or variable remuneration under their employment contracts with the Company.

No exceptional remuneration or other remuneration was paid to the directors during fiscal year 2019 and 2020 or allocated for such fiscal years by the Company or by a company included in the Company's scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code.

The tables below shows the gross amounts of remuneration allocated for the 2019 and 2020 fiscal years and paid during the 2019 and 2020 fiscal years to the members of the Board of Directors for their terms of office, in accordance with Articles L. 225-45 and L. 22-10-14 of the French Commercial Code.

	2020 fiscal year		2019 fiscal year	
Directors whose terms of office are ongoing on 31 December 2020	**Remuneration granted for the fiscal year 2020** [1]	**Remuneration paid during the fiscal year 2020** [2]	**Remuneration granted for the fiscal year 2019** [1]	**Remuneration paid during the fiscal year 2019** [2]
Véronique Bédague-Hamilius [3]	37,857	10,761	761	n/a
Bruno Crémel [3]	40,000	34,628	27,141	2,514
François Delattre [3]	35,000	28,191	18,330	138
Gilles Denoyel [3]	40,714	34,628	27,141	2,514
Marie-Christine Lepetit	44,286	45,745	45,745	46,258
Jean-Bernard Lévy	n/a	n/a	n/a	n/a
Colette Lewiner	47,143	51,011	51,011	49,806
Laurence Parisot	38,571	35,213	35,213	37,742
Claire Pedini	45,000	44,574	44,574	41,290
Philippe Petitcolin [3]	33,571	28,191	20,705	2,514
Michèle Rousseau	38,571	37,553	37,553	36,323
Martin Vial	39,286	39,309	39,309	39,161
TOTAL *(IN EUROS)*	**440,000**	**389,803**	**347,483**	**258,260**

n/a: not applicable.

(1) The remuneration allocated for a fiscal year includes the entirety of the fixed portion and the variable portion due for the fiscal year.
(2) The payments made during a fiscal year include 50% of the fixed portion and the entirety of the variable portion for the preceding fiscal year and 50% of the fixed portion for the current fiscal year.
(3) Directors whose term of office began in fiscal year 2019.

	2020 fiscal year		2019 fiscal year	
Director whose term of office expired during the 2019 fiscal year	**Remuneration granted for the fiscal year 2020**	**Remuneration paid during the fiscal year 2020 (1)**	**Remuneration granted for the fiscal year 2019 (2)**	**Remuneration paid during the fiscal year 2019 (3)**
Olivier Appert	n/a	5,266	12,752	34,518
Philippe Crouzet	n/a	7,021	14,507	40,196
Maurice Gourdault-Montagne	n/a	6,436	16,298	31,926
Bruno Lafont	n/a	10,532	18,018	38,067
Bruno Léchevin	n/a	7,606	15,093	34,518
Anne Rigail	n/a	13,281	15,794	2,514
TOTAL (IN EUROS)	**N/A**	**50,142**	**92,462**	**181,739**

n/a: not applicable.

(1) The payments made during the fiscal year 2020 include the entirety of the variable portion for the fiscal year 2019.

(2) Remuneration granted to Directors until the end of their term of office.

(3) Payments made in 2019 include 50% of the fixed portion and the entirety of the variable portion for the 2018 fiscal year, as well as the fixed portion due in respect of 2019 determined pro rata to the term of office in the 2019 fiscal year.

4.6.4 Stock options – Bonus shares

The Company has not implemented any stock options plans and the corporate officers receive no allocation of bonus shares [1].

(1) With the exception of any directors elected by the employees who may benefit from the systems implemented by the Company for the benefit of all its employees.

EDF invests in innovation to build the most efficient energy transition solutions in order to meet the goal of reducing carbon emissions at the lowest possible cost. EDF relies on its R&D, whose activities are structured around 3 areas of transition: electrical, climatic as well as digital and societal transition.

€16.5 billion	94%	€685 million	716
GROS OPERATING INVESTMENTS	SHARE OF INVESTMENTS IN LINE WITH THE GROUP'S LOW CARBON OBJECTIVES	R&D EXPENDITURE	INNOVATIONS PATENTED BY R&D AT THE END OF 2020

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5

THE GROUP'S FINANCIAL PERFORMANCE AND OUTLOOK

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5.1 Review of the financial situation and results 2020

5.1.1 Key figures

The financial information presented in this document is developed from the EDF group's consolidated financial statements at 31 December 2020.

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements at 31 December 2020 are prepared using the presentation, recognition and measurement rules set forth in the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2020. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and SIC and IFRIC interpretations.

The accounting methods applied by the Group are presented in note 1 to the consolidated financial statements at 31 December 2020.

The sale of Edison's E&P operations and the impact of this restatement are presented in note 1.4.2 to the consolidated financial statements at 31 December 2020. Details of the assets held for sale and related liabilities are given in note 3.2 of this report.

At 31 December 2020, in application of IFRS 5, the amounts of Edison's Algerian E&P assets and liabilities are presented in the consolidated balance sheet as continuing operations, while the Norwegian E&P operations are presented in the consolidated balance as discontinued operations. The net income for the Algerian and Norwegian E&P operations is reported in the specific line "Net income of continuing operations" and allocated to the relevant lines of the income statement for the periods published. The net income of discontinued operations corresponding to Edison's E&P operations excluding the Algerian and Norwegian E&P operations is still reported on a specific line in the income statement for the periods published, until finalisation of the sale which took place on 17 December 2020.

The Group's key figures for 2020 are shown in the following table:

(in millions of euros)	2020	2019 [1]	Variation	Variation (%)	Organic variation (%)
Sales	69,031	71,347	(2,316)	-3.2	-3.4
Operating profit before depreciation and amortisation (EBITDA)	16,174	16,723	(549)	-3.3	-2.7
Operating profit (EBIT)	3,875	6,757	(2,882)	-42.7	-41.6
Income before taxes of consolidated companies	1,293	6,393	(5,100)	-79.8	-78.8
EDF net income	650	5,155	(4,505)	-87.4	-86.4
Net income excluding non-recurring items [2]	1,969	3,871	(1,902)	-49.1	-47.8
Net income excluding non-recurring items, adjusted for payments on hybrid bonds	1,468	3,282	(1,814)	-55.3	n.a
Group cash flow [3]	(2,709)	(825)	(1,884)	-228.4	n.a
Net indebtedness [4]	42,290	41,133	1,157	+2.8	n.a

n.a not applicable.

(1) The published figures for 2019 (except NFD) have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Net income excluding non-recurring items is not defined by IFRS and is not directly visible in the Group's consolidated income statement. It corresponds to the Group's share of net income (EDF net income) excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax (see section 5.1.4.10 "Net income excluding non-recurring items").

(3) Group cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not comparable with indicators of the same name reported by other companies. It is equivalent to the operating cash flow less asset disposals, income taxes paid, net financial expenses disbursed, allocations to dedicated assets, dividend paid in cash, and investments related to the Hinkley Point C and Linky projects (see section 5.1.5.1.3).

(4) Net indebtedness is not defined in the accounting standards and is not directly visible in the Group's consolidated balance sheet (see section 5.1.5.1).

EXTRACT FROM THE CONSOLIDATED BALANCE SHEET

(in millions of euros)	31/12/2020	31/12/2019
Intangible and tangible assets	179,658	174,345
Other non-current assets	57,574	55,120
Non-current assets	**237,232**	**229,465**
Inventories and trade receivables	29,259	29,655
Other current assets	30,834	36,568
Cash and cash equivalents	6,270	3,934
Current assets	**66,363**	**70,157**
Assets held for sale	2,296	3,662
TOTAL ASSETS	**305,891**	**303,284**
Equity (EDF's share)	45,633	46,466
Equity (non-controlling interests)	9,593	9,324
Total equity	**55,226**	**55,790**
Non-current provisions	85,837	80,760
Special concession assets	48,420	47,465
Other non-current liabilities	63,888	64,225
Non-current liabilities	**198,145**	**192,450**
Current liabilities	**52,412**	**54,001**
Liabilities related to assets classified as held for sale	108	1,043
TOTAL EQUITY AND LIABILITIES	**305,891**	**303,284**

5.1.2 Economic environment

5.1.2.1 Market prices for electricity and the principal energy sources

In an interconnected European market, analysis of French market prices must be related to analysis of market prices in the neighbouring countries.

Spot electricity prices in 2020 were lower than in 2019 throughout Europe.

5.1.2.1.1 Spot electricity prices in Europe [(1)]

	France	United Kingdom	Italy	Germany	Belgium
Average baseload price for 2020 *(€/MWh)*	32.2	39.6	38.9	30.5	31.9
Variation in average baseload prices, 2020/2019	-18.4%	-19.2%	-25.6%	-19.1%	-19.0%
Average peakload price for 2020 *(€/MWh)*	39.0	46.1	44.7	37.5	37.9
Variation in average peakload prices, 2020/2019	-15.9%	-13.8%	-23.4%	-15.7%	-18.1%

(1) **France** and **Germany**: average previous day EPEXSPOT price for same-day delivery;
Belgium: average previous day Belpex price for same-day delivery;
United Kingdom: average previous day EDF Trading OTC price for same-day delivery;
Italy: average previous day GME price for same-day delivery.

The comments below concern baseload prices.

In **France**, spot electricity prices stood at an average €32.2/MWh (baseload) and €39.0/MWh (peakload) in 2020, down by €7.2MWh and €7.4/MWh respectively from 2019.

This decrease was mainly concentrated in the first half of the year under the combined effects of lower demand during lockdown, very low commodity prices, and high wind power output at European level. In the second half of the year, a recovery in demand and a moderate rise in gas prices brought spot prices close to their 2019 level for the same period.

In January and February, the marked decline in spot prices was attributable to very low gas and coal prices compared to early 2019, the fairly mild winter temperatures, and high stocks of gas and coal. Starting in March, the national lockdown significantly reduced demand for electricity: cumulative consumption between March and June was 15TWh lower in 2020 than 2019.The drop in CO_2 prices in March when all stock markets were falling also contributed to the price decrease. Spot prices for the first half-year of 2020 thus stood at an average €17.3/MWh below first-half prices in 2019.

The second half of the year saw prices return to similar levels to 2019: from July, prices were sustained by the recovery in demand for electricity combined with lower nuclear power output due to maintenance work in preparation for the winter. In the final quarter, gas prices returned almost to their end-2019 levels and coal and CO_2 prices rose, pushing spot electricity prices up.

Demand in France in 2020 totalled 449.0TWh, down by 24.4TWh from 2019. Output by nuclear and thermal power facilities declined by -44.1TWh and -3.3TWh respectively (gas-fired plants) compared to 2019, due to lower demand and disruption to nuclear fleet availability as a result of the Covid-19 pandemic. Hydropower output was up by 5.1TWh in 2020, as was intermittent renewable energy output (+5.9TWh for wind power and +0.3TWH for solar power).

France's export balance was 12.2TWh [1] lower than in 2019. Most of the decrease concerned the third quarter (-13.6TWh), when thermal plant availability was lower.

In the **United Kingdom**, average spot electricity prices were down by €9.4/MWh compared to 2019, standing at an average €39.6/MWh for 2020. The decrease was observed across the whole of the first half-year from January, initially due to low gas prices (gas accounted for more than one third of 2020 energy production in the United Kingdom), and then to national lockdown's effects on demand. Like France, the United Kingdom saw a return to near-2019 levels in the second half of the year as demand recovered and gas prices showed only a small upturn.

In **Italy**, average spot prices decreased by €13.4/MWh compared to 2019, standing at an average €38.9/MWh for 2020. This was one of the largest average decreases in Europe along with Spanish prices, illustrating the lockdown's dramatic impact on demand for electricity in Italy in the first half-year, and the importance of gas in the Italian electricity mix.

In **Germany**, average spot prices were €7.2/MWh lower than in 2019 at €30.5/MWh for 2020. Price movements followed a similar curve to French spot prices, with a substantial decrease in the first half-year followed by a recovery in the second half-year. In the first half of the year, low fuel prices, a mild winter and higher levels of wind power output added to the impact of the national lockdown on demand (although the effect was less pronounced than elsewhere in Europe) and prices were pulled downwards (-€14.9TWh lower than in first-half 2019). Starting in the summer, prices returned to a level close to second-half 2019, when fuel prices had already been relatively low.

In **Belgium**, spot prices retreated by €7.5/MWh from 2019, with an average price of €31.9/MWh for 2020. This decrease exclusively concerned the first half-year (prices were lower by an average -€17.2/MWh than in first-half 2019) and had similar causes as in neighbouring countries: the levels of gas and coal prices, high renewable energy output, the mild winter, and demand affected by lockdown.

5.1.2.1.2 Forward electricity prices in Europe [2]

	France	United Kingdom	Italy	Germany	Belgium
Average forward baseload price under the 2021 annual contract in 2020 *(€/MWh)*	44.9	48.4	49.2	40.2	40.7
Variation in average forward baseload price under the annual contracts, 2020/2019	-11.7%	-17.1%	-17.8%	-15.8%	-20.1%
Forward baseload price under the 2021 annual contract at 31 December 2020 *(€/MWh)*	52.1	60.4	57.7	48.2	48.9
Average forward peakload price under the 2021 annual contract in 2020 *(€/MWh)*	57.9	54.7	55.3	49.1	51.9
Variation in average forward peakload price under the annual contracts, 2020/2019	-9.0%	-15.4%	-17.3%	-14.8%	-16.9%
Forward peakload price under the 2021 annual contract at 31 December 2020 *(€/MWh)*	63.0	67.1	63.5	57.5	57.5

(1) Source: RTE until August 2020 then ENTSO-E Transparency Website.

(2) **France** and **Germany**: average year-ahead EEX price;
Belgium and **Italy**: average year-ahead EDF Trading price;
United Kingdom: average ICE annual contract prices, April 2020 then April 2021 (in the UK, annual contract deliveries take place from 1 April to 31 March).

Average annual contract prices for baseload and peakload electricity declined all over Europe in the first half of 2020, before showing an upward trend towards the end of the year. These changes are principally explained by movements in commodity prices and in France, announcements concerning the generation fleet, particularly nuclear facilities.

In **France**, the average annual contract baseload price for next-year delivery was €44.9/MWh, down by 11.7% from 2019. This downturn masks a downward trend that followed movements in commodity prices, which were low in the first half-year due to surplus worldwide fossil resources and the aggravating effect of the Covid-19 pandemic, but then recovered from the summer in response to prospects of an end to the crisis. Prices were also influenced by announcements concerning the nuclear generation fleet, containing successive adjustments to the nuclear power target and news of a maintenance schedule designed to ensure the highest possible generation for the winter of 2020-21.

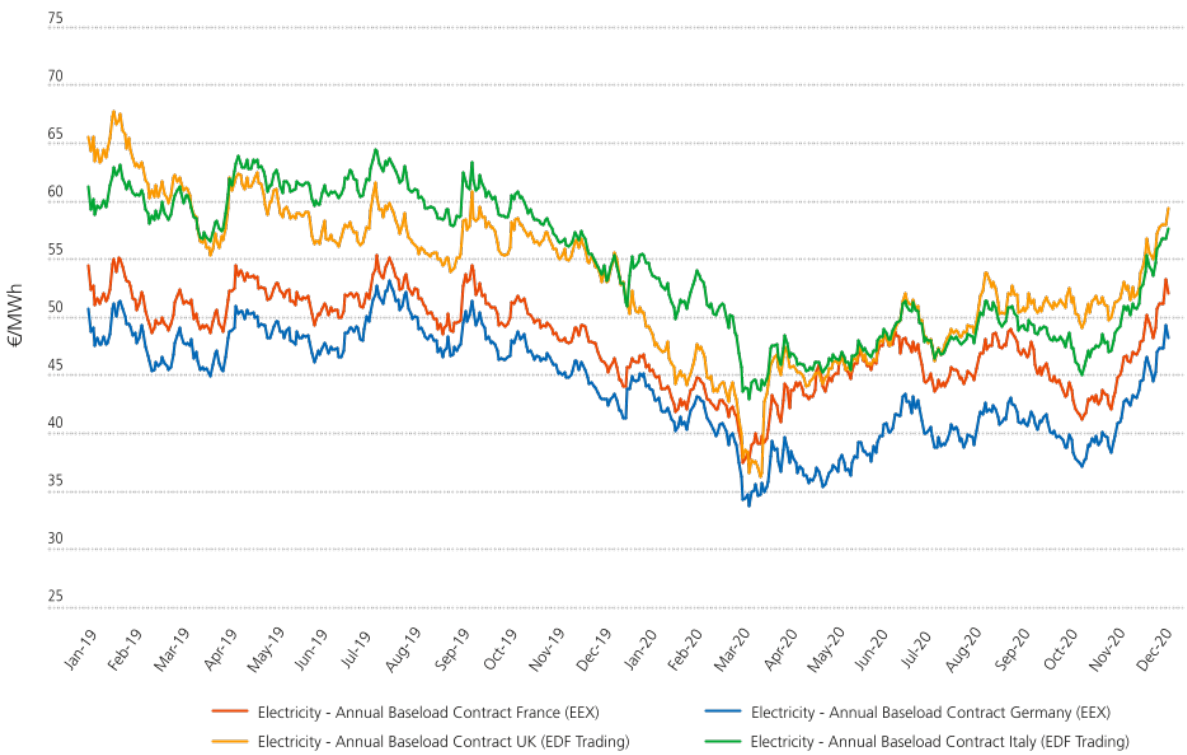
In the **United Kingdom**, the April Ahead contract baseload price for 1 April Y+1 to 31 March Y+2 was down by 17.1% to an average €48.4/MWh for 2020. As in France, UK prices were significantly lower year-on-year in the first half of the year, then recovered when gas and CO_2 prices stopped falling, since gas-fired plants make a significant contribution to formation of electricity prices in the UK.

In **Italy**, the annual contract baseload price for next-year delivery also declined, averaging €49.2/MWh for 2020, down by -17.8% from 2019. This substantial decrease is associated with the fall in commodity prices at the heights of the Covid-19 crisis. CO_2 prices, which were still volatile, provided steady support for electricity price levels as a result of the high gas component in the Italian electricity mix.

In **Germany**, the average annual contract baseload price for next-year delivery was down by 15.8% from 2019, to an average €40.2/MWh in 2020. This decrease is explained by the movements in fuel and CO_2 prices, since coal-fired facilities still make a significant contribution to the formation of German electricity prices and are more strongly affected than gas-fired facilities by rises in CO_2 prices. The forward price under the 2021 annual contract ended the year at €48.2/MWh, sustained by the level of CO_2 prices.

In **Belgium**, the annual contract baseload price for next-year delivery was 20.1% lower than in 2019, standing at an average €40.7/MWh in 2020. The decrease was particularly pronounced in the first half of the year due to a decline in fuel prices.

Principal forward electricity prices in Europe (baseload year ahead), in €/MWh



5.1.2.1.3 CO_2 emission rights prices [(1)]

In 2020 the average price of CO_2 emission certificates for delivery in December Y+1 was €25.1/t (-0.4% or -€0.1/t compared to 2019). This relative stability masks high price volatility, partly related to the effects of the Covid-19 pandemic and partly to negotiations over the European Union climate targets for 2030, which were widely interpreted and followed by speculators. The price collapsed in March when lockdown measures were imposed in Europe, losing €8.4 in a single week. From April, the price responded positively to announcements of measures to restart the national economies and ecological political signals, twice exceeding €30/t (in July and in September). Late in the year, announcements concerning vaccination and the European Union's adoption of higher emission-reduction targets for 2030 which were raised to 55%, continued to drive quota prices up and they ended the year at €32.7/t.

(1) Average ICE prices for the annual contract, Phase III (2013-2020).

CO_2 emission rights prices, in €/t

5.1.2.1.4 Fossil fuel prices [1]

	Coal *(US$/t)*	Oil *(US$/bbl)*	Natural gas *(€/MWhg)*
Average price for 2020	58.0	43.2	13.0
Average price variation, 2020/2019	-16.6%	-32.6%	-29.4%
Highest price in 2020	71.1	68.9	16.5
Lowest price in 2020	51.8	19.3	10.7
Price at 31 December 2020	68.9	51.8	16.4
Price at 31 December 2019	56.4	66.0	16.0

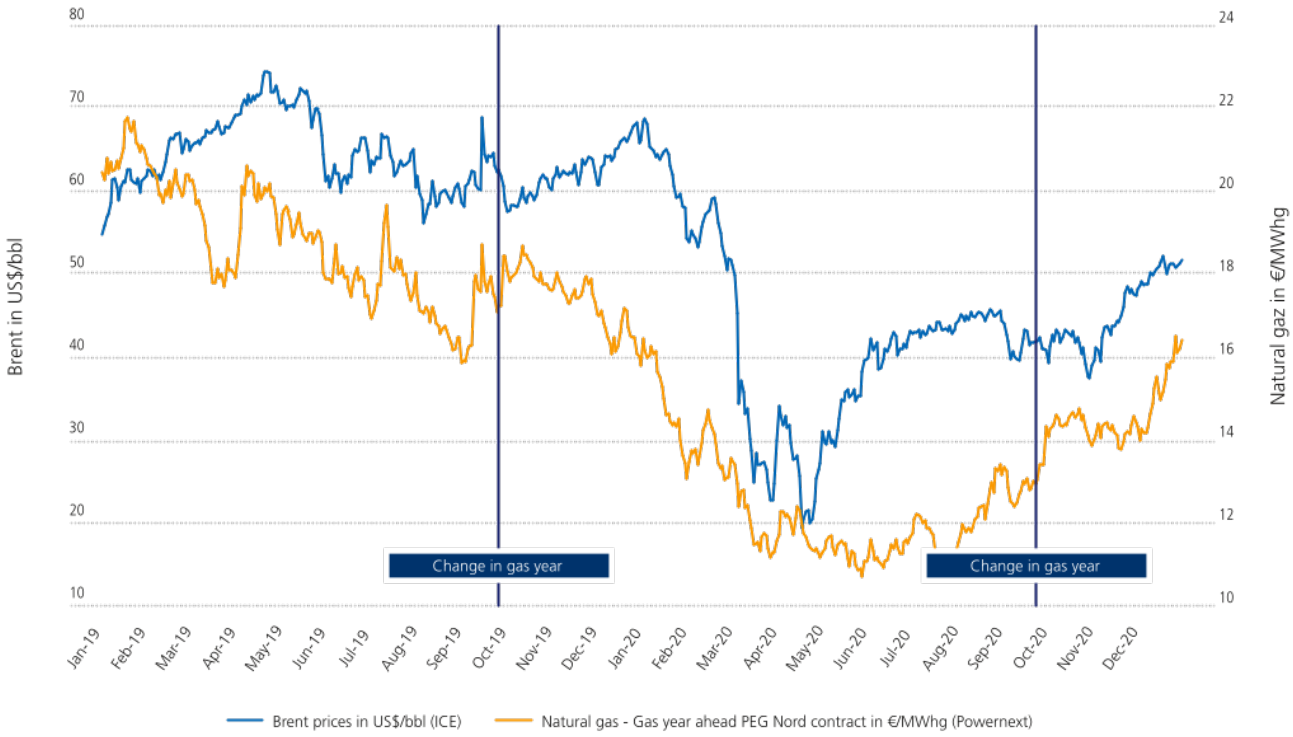
Coal prices for next-year delivery in Europe stood at an average US$58.0/t in 2020 (-US$11.6/t or -16.6% compared to 2019). In the first half of the year, coal prices initially continued the downward trend begun in 2019 due to pessimistic forward demand forecasts all over the world, and the existence of high stocks across Europe. Demand for coal, which was already weakened by competition from gas and the economic slowdown, was hit hard by the lockdown measures and their impacts on economic growth. However, supply was also limited by strikes and economic factors, and this kept coal prices at US$55-60/t throughout the third quarter of 2020. In the fourth quarter, the strong recovery by Asian demand, particularly in China for imports from Russia and South Africa, drove a substantial increase in prices.

Oil prices stood at an average US$43.2/bbl for 2020 (-US$20.9/t or -32.6% compared to 2019). In the first quarter, the Covid-19 pandemic dramatically reduced demand for oil and set the Brent barrel price on a downward trend for the rest of the year due to its direct impact on mobility (lockdowns, travel restrictions) and its influence on the economy (reduced demand for trade and industrial activity). To support oil prices, OPEC+ took steps to reduce supply in keeping with the disruption to demand, signing an agreement on 12 April to cut production by up to 9.7 million barrels a day. This agreement was negotiated against a background of tensions after a price war between Saudi Arabia and Russia. It was applied throughout the year, with renegotiations in line with hopes of a recovery in demand, and certain adaptations by different stakeholders.

The annual **gas** contract price for next-year delivery at the French PEG hub was an average €13.0/MWh in 2020 (-29.4% or -€5.4/MWh compared to 2019). During the first half of the year, the impact of the Covid-19 crisis on demand for gas helped to maintain the downward trend begun in 2019. The low demand was combined with mild temperatures, high stocks, and support for non-conventional production in North America. But in June the price slump began to slow down following cancellation of LNG deliveries from the USA and economically-driven closures of certain production sites for non-conventional hydrocarbons. The upward movement continued during the second half of the year, occasionally boosted by unscheduled and scheduled suspension of production in Europe, and more fundamentally the recovery of demand in Asia.

(1) **Coal**: average ICE prices for delivery in Europe (CIF ARA) for the next calendar year (US$/t);
Oil: ICE price for Brent crude oil barrel (front month) (US$/barrel);
Natural gas: average ICE OTC prices, for delivery starting from October of the following year in France (PEG) (€/MWhg).

Natural gas and oil prices



5.1.2.2 Electricity and gas consumption

5.1.2.2.1 Electricity and gas consumption in France

Electricity consumption in France showed a substantial decrease of -24.4TWh from 2019:

- Consumption in the first quarter of 2020 was well below consumption in the first quarter of 2019 (-5.0%): January and February were marked by very mild weather for the season, and March suffered the initial effects of the national lockdown;
- The second quarter was strongly affected by the Covid-19 pandemic and consumption fell by 13.3% year-on-year;
- The decrease was more moderate in the third quarter due to the resumption of economic activity (first visible in June) and a relatively hot summer season;
- Finally, consumption in the final quarter was 1.2% lower year-on-year, principally due to the slower economy.

For the whole year, the decrease in consumption in mainland France attributable to the economic consequences of government measures to contain the Covid-19 pandemic is estimated at slightly more than 18TWh.

Gas consumption in France totalled 444.5TWh, down by 7.2% compared to 2019. The decrease mainly concerned:

- the months of January and February (-9.4% on average), when temperatures were mild for the season;
- the second quarter (-23%) due to warm weather in April (resulting in lower consumption for heating in early spring) and the lockdown, which reduced gas consumption for industry and also consumption of electricity, resulting in lower output by gas-fired facilities;
- in the second half of the year, consumption was down slightly because of the lower production of gas for electricity generation.

5.1.2.2.2 Electricity and gas consumption in Italy

Electricity consumption in Italy [(1)] totalled 302.8TWh in 2020, 5.3% less than in 2019 as a result of the Covid-19 pandemic. The principal decrease was observed in the first half of 2020. The lower level of thermoelectric and wind power output was partly offset by an increase in hydropower and solar power generation. Net imports were down by 15.6%.

Domestic demand for natural gas in Italy [(2)] totalled 70.7bcm, a decrease of 4.1% from 2019 that confirms the lower consumption trend caused by restrictions introduced in the early months of 2020 to contain the Covid-19 pandemic. All segments registered a downturn. In absolute value, thermoelectric uses registered the largest decrease (-1.3 billion m^3, -5% from 2019) under the impact of the fall in electricity demand.

(1) Sources for Italy: unadjusted data and data provided by Terna, the Italian national grid operator, and adjusted by Edison.

(2) Sources for Italy: Ministry for Economic Development (MSE), Snam Rete Gas data adjusted by Edison on the basis of 1Bcm = 10.76TWh.

5.1.2.3 Electricity and natural gas sales tariffs

In **France**, the regulated sales tariffs were raised:

- on 1 February 2020 by 2.4% (including taxes) for both residential customers and non-residential customers on the "blue" tariff;
- on 1 August 2020 by 1.54% (including taxes) for residential customers on the "blue" tariff and 1.58% (including taxes) for non-residential customers on the "blue" tariff.

In the **United Kingdom**, a cap on the variable tariffs for residential electricity and gas customers was introduced on 1 January 2019. This cap is updated every 6 months to take account of cost revisions. It was reduced by 7% for the period 1 October 2020 to 31 March 2021 in order to reflect movements in wholesale market prices associated with the Covid-19 pandemic. In October, the British government announced that the cap would continue for at least a further twelve months, until the end of 2021.

5.1.2.4 Weather conditions: temperatures and rainfall

5.1.2.4.1 Temperatures in France

2020 was France's warmest year on record since 1900, registering an annual temperature of 13.6°C (the record was previously 13.4°C, in 2018), 1°C higher than normal and 0.5°C higher than 2019.

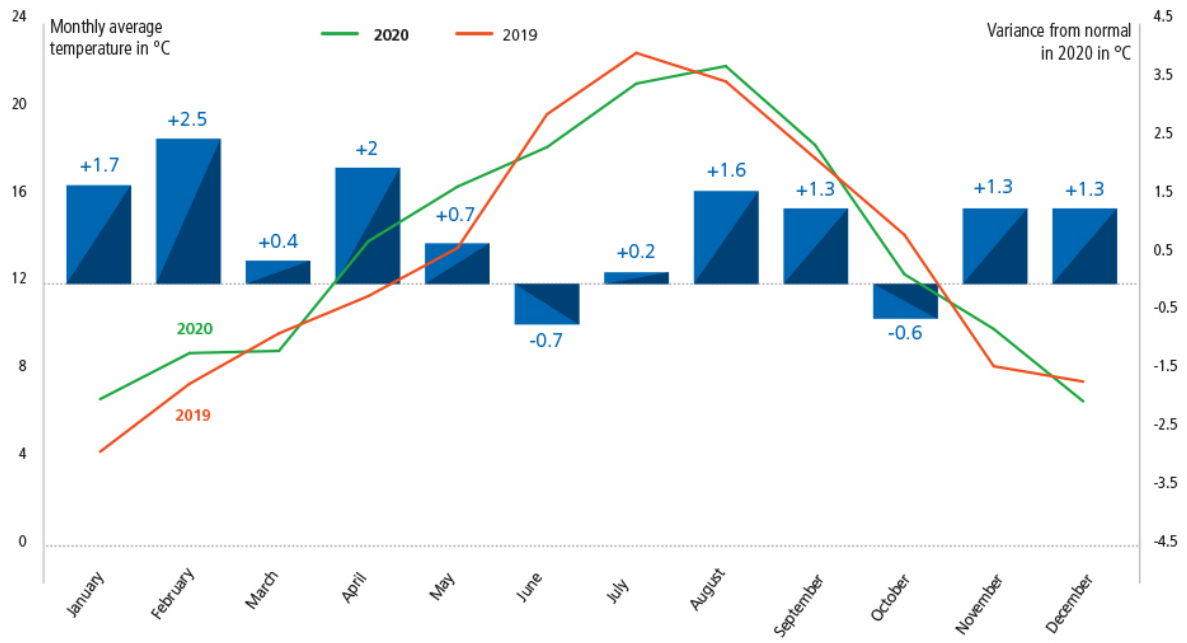
February 2020 was the second-warmest month of February since 1980 (after February 1990), and April and August 2020 the third-warmest (behind April 2007 and April 2011, and August 1997 and August 2003).

Two weeks during the summer of 2020 registered temperatures 5°C above normal (6-12 August: +5.3°C, and 13-20 September: +5.0°C).

In October, after relatively cool temperatures until the 19th (2.1°C below normal), the weather grew milder and stayed mild overall until the end of the year (an average +1.4°C above normal, although there were several days with below-normal temperatures).

The middle of December (11-24) was particularly mild, with a peak on 22 December at +7.5°C above normal.

Temperatures [(1) (2) (3)] in France in 2020 and 2019



(1) Average temperatures recorded in 32 cities, weighted by electricity consumption.
(2) Source: Miréor (data from Météo-France).
(3) Normal temperatures are applicable to the decade 2011-2020.

5.1.2.4.2 Rainfall

In 2020, rainfall **in Europe** was characterised by:

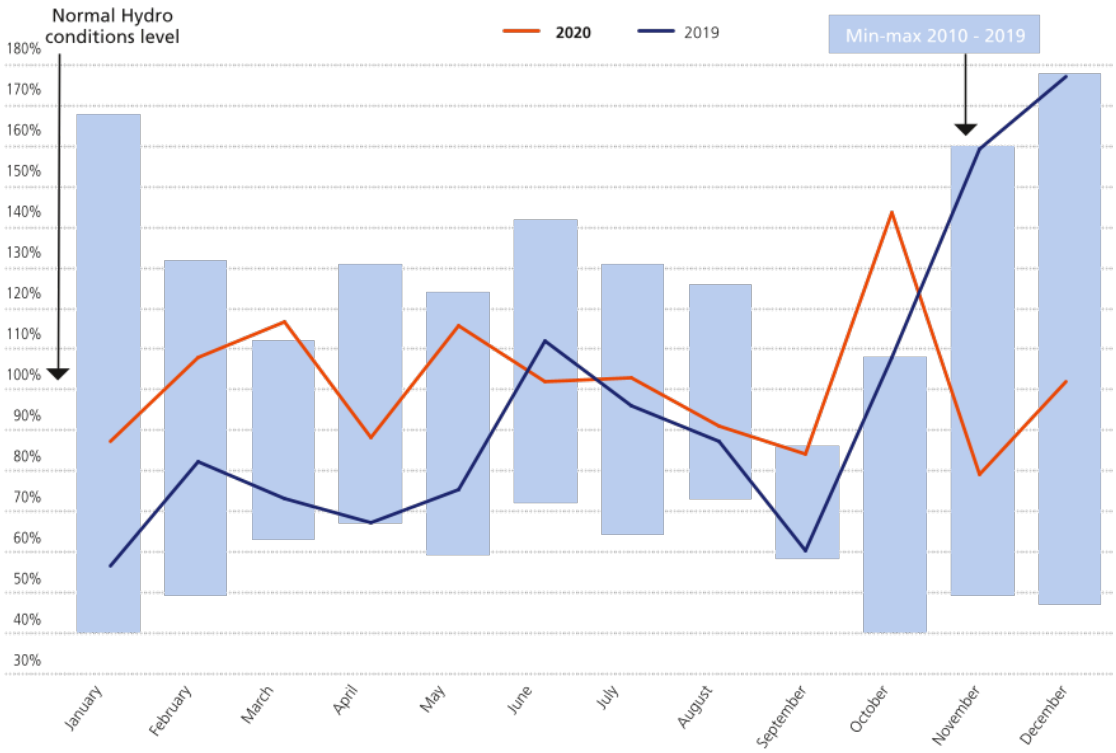
- a first half-year with normal precipitation over much of Europe, except for Scandinavia where above-normal rainfall was recorded and Italy where there was a shortage of rain;
- a second half-year that began with a very dry summer, followed by a wetter autumn. As a result rainfall remained above normal in Scandinavia, and became above normal in the United Kingdom and Central Europe.

In France, rainfall in 2020 was close to normal levels at national and annual level, but there were sharp regional contrasts. The wettest months were February, June, October and December, while April, July and November were very dry. There was a notably hot, dry summer in the north-east quarter of France, leading to severely low water levels in that zone.

Snow fell early on the French Alps and the Pyrénées, and snow levels were generally above normal until the end of the winter in the French Alps and closer to normal overall in Pyrénées and in the Rhine region. The mid-height mountains (below 1,600m) had below-normal snow levels due to abnormally high temperatures in the winter of 2019-20. The snowcap began to melt early, from mid-March, in all mountain areas.

As a consequence of these hydrometeorological conditions, annual water flow coefficients in France were slightly above normal in 2020, by about 3%. Nonetheless there were marked disparities between different areas and periods. In the plains and the Massif Central mountains water levels were often below normal or significantly below normal, while the Alps and the Pyrénées often had above-normal levels.

Hydrological conditions in France in 2020 and 2019*



** Weekly monitoring of French reservoir levels by the EDF group's statistical observatory (Miréor project) as far as the coast.*

5.1.3 Significant events

5.1.3.1 Major events

This section reports significant events since the publication, on 13 March 2020, of the 2019 Universal Registration Document (see chapter 5.1.3 "Significant events of 2019" and 5.2 "Subsequent events").

5.1.3.1.1 Sustainable development and Group Renewables

- At the General Shareholders' Meeting of 7 May 2020, the Company's ***raison d'être*** was adopted for inclusion in the articles of association. It reads as follows: "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development".
- **Reinforcement of climate-related governance**: the EDF group appointed "Climate point persons" in its Executive Committee and Board of Directors (see the press release of 10 December 2020):
  - the Group Senior Executive Vice-President in charge of Innovation, Corporate Social Responsibility and Strategy, Alexandre Perra, is the Climate point person in the Group Executive Committee. In this capacity, he presents the Group's net zero-carbon ambition to the Board's Corporate Social Responsibility Committee and the Board itself;
  - the Chairwoman of the Corporate Social Responsibility Committee, Claire Pedini, is the Climate point person in the Board of Directors. In this capacity and in liaison with the Chairman of the Board of Directors and the Executive Committee's Climate point person, she ensures that the Board identifies all impacts of climate change for the Group and that the work undertaken by the Board and the strategy it defines incorporate climate change considerations.
- The Group also adopted:
  - an objective of carbon neutrality by 2050;
  - a higher CO_2 emission reduction target, aiming to cut direct and indirect emissions by the Group (scopes 1 and 2) by 40-50% between 2017 and 2030 and scope 3 emissions by 28% between 2019 and 2030 (see the press release of 10 December 2020);
  - an exit target for coal-fired electricity generation by 2030 in all geographical (see the press release of 14 May 2020).

Wind power

- EDF Renewables, Enbridge and wpd started construction of the Fécamp offshore wind farm (see the EDF Renewables press release of 2 June 2020).
- The EDF and CEI (China Energy Investment Corporation) groups joined forces for construction and operation of offshore wind power projects in China (see the EDF Renewables press release of 2 June 2020).
- Construction of the first phase of the Taza wind farm in Morocco was ready to be launched by the EDF Renewables – Mitsui & Co. consortium (see the EDF Renewables press release of 9 September 2020).

Solar power

- EDF Renewables-Jinko Power consortium was awarded the world's most powerful solar project in Abu Dhabi (see the EDF Renewables press release of 27 July 2020).

  EDF renewables-Jinko Power consortium reached the financial closing of the world's largest solar plant project and launches its construction in Abu Dhabi (see the EDF Renewables press release of 22 December 2020).
- *EDEN Renewables India increased its portfolio with 1,350MWp of new solar photovoltaic power plants* (see the EDF Renewables press release of 1 October 2020).
- EDF Renewables North America and Geenex Solar signed an agreement for a pipeline of up to 4.5GW of solar projects in different stages of development in the United States (see the EDF Renewables press release of 16 October 2020).
- EDF Renewables was awarded 105MW of ground-based solar power plants in France following the latest solar tender by the CRE (see the EDF Renewables press release of 23 October 2020).
- EDF Renewables won two ground-based solar power projects in the Pays de la Loire region of France in the latest solar call for tenders issued by the Energy Regulation Commission (CRE) (see the EDF Renewables press release of 13 November 2020).
- EDF Renewables commissioned a new solar farm with storage in French Guiana (see the EDF Renewables press release of 2 December 2020).
- Bboxx, EDF, and SunCulture teamed up with Togo's Government to accelerate access to sustainable solar-powered farming (see the press release of 18 December 2020).

Hydropower

- EDF commissioned the new Romanche-Gavet hydroelectric plant in the Isère area of south-east France (see the EDF Renewables press release of 9 October 2020).

Storage

- EDF Renewables North America signed a contract for 200MW solar + storage 180MW/4 hours in Nevada (see the EDF Renewables press release of 29 July 2020).
- EDF Renewables North America signed a Power Purchase Agreement with CleanPowerSF for storage expansion at the Maverick 6 solar project (see the EDF Renewables press release of 28 September 2020).

Hydrogen

- Germany's Federal Ministry of the Economy approved funding for the WESTKÜSTE100 project (see press release of 5 August 2020).
- The Auxerre agglomeration in France, in partnership with Hynamics and Transdev, have joined forces on a green hydrogen project at the service of the energy transition in the area (see the press release of 17 December 2020).

Sustainable finance

- EDF and Standard Chartered Bank signed a €200 million credit facility indexed on ESG criteria (see the press release of 30 October 2020).

5.1.3.1.2 Nuclear industry

- EDF Energy filed the planning application for a Development Consent Order (DCO) for the Sizewell C project in the United Kingdom (see the EDF Energy press release of 27 May 2020).
- The Hinkley Point C project reached a major milestone: the "common raft" for the second reactor was completed to schedule (see the EDF Energy press release of 1 June 2020).
- EDF estimated annual nuclear power output for 2020 and 2021 at between 330-360TWh (see the press release of 16 April 2020).
- EDF issued an initial progress report on the status of the excell plan for excellence in France's nuclear industry (see the press release of 15 October 2020).
- EDF readjusted the cost of its *Grand Carénage* programme (see the press release of 29 October 2020).
- Hinkley Point B: UK's nuclear power station to move into decommissioning by July 2022 (see the EDF Energy press release of 19 November 2020).
- An update on the Hinkley Point C project was released (see the press release of 27 January 2021).

5.1.3.1.3 Other

- Edison completed E2I acquisition and consolidates its role of second wind operator in Italy (see the Edison press release of 16 February 2021).
- EDF was appointed by Ofgem to supply customers of Green Network Energy (see the EDF Energy press release of 30 January 2021).
- Volkswagen Group France and EDF signed a partnership to accompany customers who have chosen electric engines (see the press release of 15 January 2021).

5.1.3.2 Asset disposal plan

Edison finalised the sale of its Exploration and Production operations to Energean. The scope of the operations sold comprises the assets, mining rights and investments in the hydrocarbon sector in Italy, Egypt, Greece, the United Kingdom and Croatia (see the Edison press release of 17 December 2020).

Edison also announced the signing of an agreement with Sval Energi for the sale of 100% of Edison Norge AS, the company that controls the Exploration and Production operations in Norway that were excluded from the scope of the sale to Energean (see the Edison press release of 30 December 2020).

5.1.3.3 Financial structure

- EDF raised €2.1 billion through two issues of Euro-denominated Hybrid Notes (press release of 8 September 2020).
- EDF announced the success of its offering of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*) (see the press release of 8 September 2020).

5.1.3.4 Regulatory environment

Regulatory changes are described in detail in the following notes to the consolidated financial statements at 31 December 2020:

- France's multi-year energy programme (PPE): see note 2 "Summary of significant events";
- Regulated electricity sales tariffs in France – "blue" tariffs: see note 5.1.1 "Regulatory changes in France";
- TURPE network access tariffs: see note 5.1.1 "Regulatory changes in France";
- ARENH: see note 5.1.1 "Regulatory changes in France";
- Compensation for public energy service charges (CSPE): see note 5.4.1 "Operating subsidies";
- French capacity mechanism: see note 5.1 "Sales";
- Energy savings certificates: see note 5.4.3 "Other items (of other operating income and expenses)".

5.1.3.5 Other significant events

- **The Covid-19 pandemic:** the economic disruption caused by the Covid-19 pandemic brought demand for electricity down and had significant repercussions for the Group, which withdrew all its financial targets for 2021 in April 2020 (see the press release of 14 April 2020). The Group's new financial outlook is presented in section 10 of this report.

  The pandemic affected nuclear power output in France, energy sales and services in all geographical zones, and volumes delivered in France. The estimated impact on Group EBITDA at 31 December 2020 is -€1,479 million [(1)]. Other information concerning the effects of Covid-19 was made available during the year in the following press releases:

  - status on the consequences of the Covid-19 sanitary crisis (press release of 23 March 2020);
  - the EDF group united in its determination to tackle the public-health crisis (press release of 2 April 2020);
  - EDF introduces new measures to support its customers in the context of the Covid-19 pandemic (press release of 16 April 2020);
  - EDF enriches its service offering to support businesses resuming their operations with its *Pack Redémarrage* (press release of 8 June 2020);
  - pursuant to the proposals made by the Board of Directors to respond to the imperative needs for solidarity and accountability towards all of the Company's stakeholders in view of the current crisis, it was decided at the General Shareholders' Meeting of 7 May 2020 that the 2019 interim dividend of €0.15 would be the only dividend for 2019, and would not be increased by the loyalty dividend (see the press release of 7 May 2020).
- **Changes in the EDF group's Executive Committee:**
  - Béatrice Buffon was appointed as Executive Director in charge of EDF's International Division (see the press release of 4 February 2020);
  - Alain Tranzer was appointed as Executive Director for industrial quality and nuclear skills (see the press release of 14 February 2020).

5.1.4 Analysis of the business and the consolidated income statement for 2020 and 2019

Presentation and analysis of the consolidated income statement for 2020 and 2019 is shown at two levels for Sales and EBITDA: a first focusing on the Group, then a second reporting on the different business segments (France – Generation and supply, France – Regulated activities, EDF Renewables, Dalkia, Framatome, United Kingdom, Italy, Other international and Other activities). EBIT (operating profit) and net income are analysed from a general standpoint.

The impacts of the Covid-19 sanitary crisis mentioned below are estimated. See note 1.4 "Comparability (including the effect of the Covid-19 pandemic)" in the Group's audited financial statements at 31 December 2020.

(in millions of euros)	2020	2019 [(1)]
Sales	**69,031**	**71,347**
Fuel and energy purchases	(32,425)	(35,091)
Other external purchases [(2)]	(8,461)	(8,625)
Personnel expenses	(13,957)	(13,797)
Taxes other than income taxes	(3,797)	(3,798)
Other operating income and expenses	5,783	6,687
Operating profit before depreciation and amortisation (EBITDA)	**16,174**	**16,723**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(175)	642
Net depreciation and amortisation [(3)]	(10,838)	(10,020)
(Impairment)/reversals	(799)	(403)
Other income and expenses	(487)	(185)
Operating profit (EBIT)	**3,875**	**6,757**
Cost of gross financial indebtedness	(1,610)	(1,806)
Discount effect	(3,733)	(3,161)
Other financial income and expenses	2,761	4,603
Financial result	**(2,582)**	**(364)**
Income before taxes of consolidated companies	**1,293**	**6,393**
Income taxes	(945)	(1,532)
Share in net income of associates and joint ventures	425	818
Net income of discontinued operations	(158)	(497)
CONSOLIDATED NET INCOME	**615**	**5,182**
EDF net income	**650**	**5,155**
EDF net income – continuing operations	804	5,639
EDF net income – discontinued operations	(154)	(484)
Net income attributable to non-controlling interests	**(35)**	**27**
Net income attributable to non-controlling interests – continuing operations	(31)	40
Net income attributable to non-controlling interests – discontinued operations	(4)	(13)

(1) The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Other external expenses are reported net of capitalised production costs.

(3) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

(1) Estimated data. See note 1.4 "Comparability (including the effect of the Covid-19 pandemic)" in the Group's audited financial statements at 31/12/2020.

5.1.4.1 Sales

Sales amounted to €69,031 million in 2020, a decrease of €2,316 million (-3.2%). Excluding the effect of movements in exchange rates (-€338 million) and changes in the scope of consolidation (+€417 million), sales registered an organic decrease of 3.4%. The impacts of the Covid-19 pandemic had an unfavourable effect on Group sales estimated at -€2,306 million.

5.1.4.1.1 Change in Group sales

(in millions of euros)	2020	2019*	Variation	Variation (%)	Organic variation (%)
Sales	**69,031**	**71,347**	**(2,316)**	**-3.2**	**-3.4**

* *The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).*

5.1.4.1.2 Change in sales by segment

The following table shows a breakdown of sales by segment, excluding inter-segment eliminations.

(in millions of euros)	2020	2019 (1)	Variation	Variation (%)	Organic variation (%)
France – Generation and supply (2)	28,361	27,870	491	+1.8	+0.7
France – Regulated activities (3)	16,228	16,087	141	+0.9	+0.9
EDF Renewables	1,582	1,565	17	+1.1	+7.6
Dalkia	4,212	4,281	(69)	-1.6	-9.3
Framatome	3,295	3,377	(82)	-2.4	-3.1
United Kingdom	9,041	9,574	(533)	-5.6	-2.0
Italy	5,967	7,597	(1,630)	-21.5	-21.7
Other international	2,420	2,690	(270)	-10.0	-5.1
Other activities	2,127	2,728	(601)	-22.0	-20.8
Inter-segment eliminations	(4,202)	(4,422)	220	-5.0	-4.2
GROUP SALES	**69,031**	**71,347**	**(2,316)**	**-3.2**	**-3.4**

(1) The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Generation, supply and optimisation in mainland France, and sales of engineering and consulting services.

(3) Regulated activities comprise distribution in mainland France, which is carried out by Enedis, EDF's island activities and the activities of Électricité de Strasbourg. In mainland France, distribution network activities are regulated via the network access tariff TURPE (Tarifs d'Utilisation des Réseaux Publics d'Électricité). Enedis is an independent EDF subsidiary as defined in the French Energy Code.

5.1.4.1.2.1 France – Generation and supply

Sales by the **France – Generation and supply** segment amounted to €28,361 million, an increase of €491 million (+1.8%) and an organic increase of €206 million (+0.7%) from 2019. The impact of the Covid-19 crisis is estimated at -€1,083 million.

Energy sales decreased by -€708 million despite a positive energy price effect amounting to +€1,215 million that could not compensate for the -€1,923 million volume effect associated with the substantial decrease in nuclear output.

Downstream market conditions had a positive effect estimated at +€487 million on the change in sales. This increase primarily results from the larger tariff adjustment than in 2019 (+€256 million), the increase in ESC costs in the bids (+€80 million), and the capacity invoiced to final customers (+€60 million).

Resales of electricity subject to purchase obligations were down by -€97 million, mainly as a result of lower spot market prices in the first half of the year, partly offset by a rise in capacity prices (the effect on EBITDA was neutral because expenses relating to purchase obligations are covered by the CSPE mechanism).

Capacity auction sales had a positive impact, as due to a change in regulations these sales concerned one more delivery year than in 2019 (see section 5.1.4.2.2.1 "France generation and supply").

A number of other factors, including the results of sales subsidiaries, also contributed to the favourable change in sales.

Electricity generation

Nuclear output in France came out at 335.4TWh, down by 44.1TWh vs. 2019, of which roughly 33TWh (1) related to the health crisis. The health crisis extended the duration of outages owing to the introduction of health restrictions and called for a complete reorganisation of the outages schedule. In addition, 2020 was marked by the extension of the outages of Flamanville 1 and 2, and of Paluel 2. The two reactors at Fessenheim were shut down definitively in 2020, following the decision of an early closure of the plant by the French government (2).

Gross hydropower generation stood at 44.7TWh (3), up by 12.6% (+5.0TWh) vs. 2019. This increase is explained by hydrological conditions that were slightly better than the historical average in 2020, whereas they were much lower than average in 2019 (see section 2.4 "Weather conditions: temperatures and rainfall").

Thermal generation facilities were used to produce 8.8TWh, -1.0TWh less than in 2019.

(1) Figures are estimates. See note 1.4 "Comparability (including the effect of the Covid-19 pandemic)" in the Group's audited financial statements at 31 December 2020.

(2) Under the terms of the protocol signed between EDF and the State, an amount of €370m has been received in 2020 as initial payments corresponding to the anticipation of expenditure related to the closure of the plant.

(3) After deduction of pumped-storage hydropower volumes, hydropower production stood at 38.5TWh for 2020 (33.4TWh for 2019).

Sales volumes to final customers (a market segment that includes local distribution firms and excludes foreign operators) were down by -25.9TWh, including 12.2TWh related to loss of customers.

EDF was a net seller on the wholesale markets to the extent of 53.9TWh. The 9.0TWh decrease in net sales on the markets is explained by the lower nuclear power output, which was partly offset by a rise in hydropower output and lower sales to final customers.

5.1.4.1.2.2 France – Regulated activities

Sales by the **France – Regulated activities** segment amounted to €16,228 million, an organic rise of €141 million (+0.9%) from 2019. The impact of the Covid-19 pandemic is estimated at -€278 million.

For Enedis [(1)], sales essentially benefited from a favourable price effect (+€462 million), principally due to developments in the indexation of the TURPE 5 distribution tariff [(2)], despite the effects of tariff optimisation by suppliers. The Covid-19 pandemic resulted in smaller quantities being delivered and a decrease in network connection services, which also affected sales income, mainly in the first half-year.

Climate-related impacts had an unfavourable effect on sales estimated at -€236 million.

5.1.4.1.2.3 EDF Renewables

EDF Renewables' sales totalled €1,582 million in 2020, an organic increase of €119 million (+7.6%) from 2019.

In an environment marked by the Covid-19 pandemic, sales from energy generation showed organic growth of +3.7%, thanks to the fleet's limited exposure to market prices and the volumes produced by wind and solar power facilities, which achieved organic growth of +6.3% following the commissioning of new plants in the second half of 2019, and generally more favourable wind and sunshine conditions. Additionally, the renewables business in the United States (distributed solar power) registered organic sales growth of 33.6%, confirming the recovery observed in the second quarter of 2020 after a particularly difficult year in 2019.

5.1.4.1.2.4 Dalkia

Sales by **Dalkia** amounted to €4,212 million in 2020, an organic decrease of €399 million (-9.3%) compared to 2019.

This change is explained by the impact of the Covid-19 pandemic, estimated at -€193 million, on Dalkia's business volumes (work was suspended in France and in other countries in the first half of the year, and services to industry and buildings were significantly scaled back), the substantially lower gas prices compared to 2019, which had no repercussions on EBITDA, and to a lesser degree the mild weather.

Heat network activities and energy and industrial refrigeration services displayed their resilience during the public health crisis, supporting continuity in essential services (hospitals, refrigerated food storage, industries, data centres, etc).

The growth in business is continuing despite the Covid-19 crisis, especially in France with the conclusion and renewal of contracts, for example the new 15-year energy performance contract with Thales Alenia Space for its Cannes site, and renewal for 8 years of the operating contract including energy efficiency targets for installations belonging to Reims and Epernay hospitals.

5.1.4.1.2.5 Framatome

Framatome's sales amounted to €3,295 million in 2020, an organic decrease of -3.1% compared to 2019. A significant portion of sales are made within the Group.

Sales were particularly affected by the Covid-19 pandemic, which had an estimated impact of -€78 million, principally concerning sales by the "Installed Base" business unit.

Order intake, including orders from EDF SA, amounted to €2.9 billion in 2020.

In commercial developments, in October Nextera awarded Framatome the contract for modernisation of the command-and-control system for the Turkey Point nuclear power plant in the United States.

5.1.4.1.2.6 United Kingdom

Sales in the **United Kingdom** in 2020 amounted to €9,041 million, €533 million lower than in 2019. Excluding foreign exchange effects (-€126 million), and changes in the scope of consolidation (-€220 million), sales saw an organic decline of 2.0% compared to 2019.

The decrease in UK sales is primarily explained by the effects of the Covid-19 pandemic on sales by the Customer business, the lower nuclear power output (-5.3TWh), and the decrease in capacity revenue. These effects were partly offset by the higher realised sales prices for nuclear power.

5.1.4.1.2.7 Italy

The **Italy** segment's sales totalled €5,967 million for 2020, an organic decrease of €1,650 million (-21.7%) compared to 2019.

In the gas activities, sales were down, in keeping with the lower prices across all markets (this had only a limited impact on the margin). The impact of the Covid-19 crisis on sales volumes to business customers (around -€40 million), the mild winter (around -€42 million) and the lower sales of gas for thermal power generation also contributed to this downturn.

In the electricity activities, sales were also down, principally as a result of a decrease in electricity prices. The Covid-19 pandemic also caused a decline in sales volumes to business customers (around -€50 million).

5.1.4.1.2.8 Other international

The **Other international** segment principally covers operations in Belgium, the United States, Brazil and Asia (China, Vietnam and Laos). Sales by this segment amounted to €2,420 million in 2020, an organic decline of €136 million (-5.1%).

In **Belgium** [(3)], sales totalled €1,736 million, an organic decrease of -€183 million (-9.6%) compared to 2019. The Covid-19 pandemic had an impact estimated at -€80 million through the decline in consumption, an unfavourable market price effect, and lower levels of business for services. Sales revenues were affected by a downturn in market prices for electricity and gas for sales to private and industrial customers, and a negative volume effect driven by the mild weather and continuing intense competition. The year 2020 also benefited from a substantial rise in wind power output, which totalled 1.17TWh (up by +25% from 2019) thanks to favourable wind conditions and an increase in installed capacity.

In **Brazil**, sales amounted to €474 million, an organic increase of +9.2% reflecting revision of the Norte Fluminense Power Purchase Agreement (PPA) price (+5% in November 2019 and +28% in November 2020). This revision was index-linked to gas prices and the Brazilian real's decline against the dollar. The Covid-19 pandemic did not have a significant effect in Brazil due to the nature of the Group's activities. It should be noted that the foreign exchange effect was significantly negative, due to the fall in the Brazilian real against the euro.

5.1.4.1.2.9 Other activities

Other activities comprise, among other entities, EDF Trading and the gas activities.

Sales by this segment amounted to €2,127 million in 2020, an organic decrease of €568 million (-20.8%) compared to 2019. The impact of the Covid-19 pandemic is estimated at -€53 million.

- Sales by the **gas activities** amounted to €729 million, an organic decrease of €492 million (-40.3%). These sales were affected by the significant decrease in wholesale prices and lower in use of Group capacities.
- **EDF Trading**'s sales totalled €912 million, an organic decrease of -9.1%. The Covid-19 pandemic had an estimated impact of -€22 million on the trading margin due to the higher provisions for counterparty risks. After the exceptional results of 2019, the trading activities continued to perform well, notably thanks to the high volatility in 2020. The increase in hedging activities, optimisation of LNG and LPG trading also contributed to this result.
- Sales by Citelum amounted to €305 million.

(1) Enedis is an independent EDF subsidiary as defined in the French Energy Code.

(2) Indexed adjustments to the TURPE 5 distribution tariff: +2.75% at 1 August 2020 and +3.04% at 1 August 2019.

(3) Belgium comprises Luminus and EDF Belgium.

5.1.4.2 Operating profit before depreciation and amortisation (EBITDA)

The Group's consolidated **EBITDA** for 2020 amounted to €16,174 million, down by 3.3% from 2019. Excluding foreign exchange effects (-€75 million) and changes in the scope of consolidation (-€24 million), EBITDA registered an organic decrease of -2.7%, demonstrating the Group's resilience in the Covid crisis.

The impact of the Covid-19 pandemic is estimated at -€1,479 million.

(in millions of euros)	2020	2019*	Variation	Variation (%)	Organic variation (%)
Sales	**69,031**	**71,347**	**(2,316)**	**-3.2**	**-3.4**
Fuel and energy purchases	(32,425)	(35,091)	2,666	-7.6	-8.0
Other external expenses	(8,461)	(8,625)	164	-1.9	-2.8
Personnel expenses	(13,957)	(13,797)	(160)	+1.2	+1.1
Taxes other than income taxes	(3,797)	(3,798)	1	0.0	+1.3
Other operating income and expenses	5,783	6,687	(904)	-13.5	-13.3
EBITDA	**16,174**	**16,723**	**(549)**	**-3.3**	**-2.7**

* *The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the consolidated financial statements at 31 December 2020).*

5.1.4.2.1 Change in consolidated EBITDA and analysis

- The Group's **fuel and energy purchases** amounted to €32,425 million in 2020, down by €2,666 million (-7.6%) from 2019 or an organic decline of €2,796 million (-8.0%).
  - In the **France – Generation and supply** segment, fuel and energy purchases amounted to €13,191 million, an organic increase of €104 million (+0.8%) over 2019, mainly resulting from higher purchase obligations for renewable energies.
  - In the **United Kingdom**, the organic decrease of €322 million (-5.1%) observed in fuel and energy purchases principally reflects a favourable price effect on gas supplies, lower volumes of electricity sales on non-domestic customers segment business, and lower consumption of fuel due to the downturn in thermal and nuclear power output.
  - In **Italy**, the decrease of €1,705 million (-28.1%) essentially results from the decrease in gas prices and gas volumes (on the wholesale market).
- The Group's **other external expenses** amounted to €8,461 million, down by €164 million (-1.9%), or an organic decrease of €242 million compared to 2019 (-2.8%).
  - In the **France – Generation and supply** segment, other external expenses amounted to €2,332 million. The organic decrease of €95 million (-3.9%) mainly relates to the continued cost-cutting actions under performance improvement plans for all areas of business, and the impact of the Covid-19 pandemic, particularly on travel.
  - In the **France – Regulated activities** segment, other external expenses amounted to €1,584 million. The organic increase of €27 million (+1.7%) from 2019 reflects the decrease in capitalised production, in line with the level of network connection activity during the Covid-19 crisis, despite the lower travel expenses.
  - In the **United Kingdom**, other external expenses showed an organic increase of €16 million (+1.7%), principally as a result of the Covid-19 pandemic and its effects on nuclear plant maintenance.
  - **EDF Renewables** registered a €34 million (+6.1%) organic increase in other external expenses, principally due to growth in the renewable energies businesses in the United States.
  - At **Dalkia**, other external expenses were up by €129 million including a scope effect of €242 million essentially resulting from full consolidation of the UK activities jointly owned with EDF Energy, and the acquisition of Breathe Energy in 2019. In organic terms these expenses were down by €110 million, reflecting the lower levels of business in service activities and subcontracted work due to the Covid-19 crisis.
- The Group's **personnel expenses** totalled €13,957 million, up by €160 million (+1.2%), corresponding to an organic increase of +€157 million (+1.1%) from 2019.
  - In the **France – Generation and supply** segment, personnel expenses amounted to €6,045 million in 2020, an increase of €13 million (+0.2%) and stable in organic terms from 2019 due notably to the impact of the business recovery plan, which was partly offset by a decrease in workforce numbers. The average workforce declined by 0.1% [(1)] from 2019 in all areas of business.
  - In the **France – Regulated activities** segment, personnel expenses totalled €3,208 million, €69 million (+2.2%) higher than in 2019, essentially as a result of pay rises and the effects of the business recovery plan. The average workforce [(1)] was slightly lower than in 2019.
  - **EDF Renewables** registered an €18 million increase (+4.9%) in personnel expenses, and an organic increase of €36 million (+9.7%) which is principally explained by a rise in workforce numbers due to growth in the development and construction businesses.
  - **Dalkia's** personnel expenses increased by €107 million (+11.0%) corresponding to a consolidation scope effect of €87 million following the full consolidation of the activities in the United Kingdom jointly held with EDF Energy and the acquisition of Breathe Energy at the end of 2019 and to an organic increase of €22 million (+2.3%) primarily caused by an increase in the workforce.
- **Taxes other than income taxes** amounted to €3,797 million for 2020, registering an organic increase of €48 million (+1.3%) compared to 2019.
  - The €21 million organic increase in Brazil is principally attributable to the ICMS tax (with no impact on EBITDA).
- **Other operating income and expenses** generated net income of €5,783 million in 2020, an organic decrease of -€888 million (-13.3%) compared to 2019.
  - In the **France – Generation and supply** segment, net income decreased by €353 million (-7.7%), with an organic change of -€348 million (-7.6%), mainly attributable to changes in fuel-related provisions.
  - In the **France – Regulated activities** segment, the decrease of €49 million (-3.4%) is principally explained by lower penalties for long power cuts.
  - In the **United Kingdom**, losses were up by €50 million (+22.8%) from 2019, with an organic increase of €53 million (+24.2%), particularly due to the increase in provisions for doubtful receivables as the Covid-19 pandemic affected the private and business customer segments.
  - **EDF Renewables** registered an organic decline of €320 million (-48.3%) in other operating income and expenses, mainly due to recognition in 2019 of the sale of 50% of the Neart na Gaoithe (NnG) Scottish offshore wind farm project, which had no equivalent in 2020.

(1) Excluding apprentices and employees on work-study contracts.

5.1.4.2.2 Change in consolidated EBITDA and analysis by segment

(in millions of euros)	2020	2019*	Variation	Variation (%)	Organic variation (%)
France – Generation and supply	7,412	7,615	(203)	-2.7	-2.7
France – Regulated activities	5,206	5,101	105	+2.1	+2.1
EDF Renewables	848	1,193	(345)	-28.9	-23.0
Dalkia	290	349	(59)	-16.9	-17.5
Framatome	271	256	15	+5.9	+4.7
United Kingdom	823	772	51	+6.6	+9.8
Italy	683	593	90	+15.2	+8.4
Other international	380	339	41	+12.1	+20.9
Other activities	261	505	(244)	-48.3	-44.8
GROUP EBITDA	**16,174**	**16,723**	**(549)**	**-3.3**	**-2.7**

* *The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the consolidated financial statements at 31 December 2020).*

5.1.4.2.2.1 France – Generation and supply

EBITDA of **France – Generation and supply activities** was down organically by 2.7% compared to 2019 and amounted to €7,412 million.

Overall, the health crisis affected the EBITDA for an estimated -€872 million due to lower nuclear Generation and supply activities (around -33TWh or -€0.6 billion), the decline in consumption (around -8TWh, or -€0.2 billion) and an estimated increase in bad debt (around -€0.1 billion).

Excluding the impact of the health crisis, EBITDA would have increased by 8.8%.

The 11TWh decline in nuclear output excluding the Covid impact was due to the definitive closure of Fessenheim, extended outages at Flamanville 1 and 2 and at Paluel 2, reduced outages to guarantee meeting demand (+14TWh). Meanwhile, hydro output rose by 5.1TWh after deducting pumped volumes. The net effect of nuclear generation excluding Covid and hydro output is estimated at -€209 million.

Power prices had a positive effect of around €748 million related to the price increases [1] in June 2019 and February 2020 (the latter including half of the tariff catch-up in 2019).

EBITDA also benefited from the increase in capacity revenues. In fact, in line with the rules governing the capacity auctions, in 2020 RTE carried out auctions for 2021 and 2022 for equivalent volumes, which led to record in 2020 two years of revenues relative to these auctions. Furthermore, 2020 witnessed a surge in capacity prices for 2020 and subsequent years. This increase was mainly driven by the reduced availability of the fleet over this timeframe, against the backdrop of the Covid-19 crisis.

Operating expenses [2] were down €148 million, *i.e.* -2.2%, partially due to the decrease in the headcount.

5.1.4.2.2.2 France – Regulated activities

EBITDA of **France- Regulated activities** amounted to €5,206 million, up 2.1% in organic terms compared to 2019 despite the crisis.

The change in prices had a positive effect of +€391 million, in line mainly with the favourable adjustments to the TURPE 5 indexation [3] distribution and transport that took place on 1 August 2019 and 2020.

Mild weather conditions generated lower distributed volumes and had an unfavourable impact of -€151 million (or -6.8TWh). Elsewhere, climatic contingencies were lower in 2020 than in 2019 (+€57 million).

The decline in distributed volumes (about -8.4TWh excluding climate effects) and the grid connection services reflected the impact of the health crisis on business. This was estimated at a total of -€237 million.

Excluding the impact of the health crisis, EBITDA would have increased by 6.7%.

5.1.4.2.2.3 EDF Renewables

EBITDA of **EDF Renewables** amounted to €848 million, down -23.0% in organic terms compared to 2019.

The exceptional level of "Development and Sale of Structured Assets" transactions in 2019 had no equivalent in 2020, which explains the €313 million decline in 2020 EBITDA, especially due to the disposal of 50% of the Scottish offshore wind farm project Neart na Gaoithe [4] (NnG).

Growth in generation and the distributed Solar & Operating Maintenance activities (mainly in the US) contributed positively to EBITDA.

Development costs increased in line with growth in business and the setting up in new regions.

The health crisis had no significant effect on EDF Renewables' business.

5.1.4.2.2.4 Dalkia

EBITDA of **Dalkia** amounted to €290 million, down 17.5% in organic terms compared to 2019.

The health crisis affected EBITDA primarily due to the closure of many customer sites and the postponement of building works (amount estimated at -€40 million), mainly in the first half of the year, with a good recovery in activities during the second half. Dalkia remained mobilised over the year alongside its customers, to ensure continuity of essential services, notably in the hospitals sector.

The operating performance plan and the control of structural costs helped strengthen competitiveness. New contracts and renewals of existing sales contracts also had a beneficial effect on EBITDA. In particular, Dalkia signed energy performance contracts with the Pontoise hospital and Thales Alenia Space for its Cannes site. The latter is a concrete example of the low-carbon transition in the industry (45% savings on energy for hot water and 980 tonnes of CO_2 avoided each year).

Conversely, occasional difficulties with UK contracts penalised financial performance.

(1) Tariff change of +7.7% excl. tax on 1 June 2019 and +3.0% excl. tax on 1 February 2020 (including half of the tariff catch-up).

(2) Sum of personnel expenses and other external expenses. A constant scope, standards, currencies and pension discount rate. Excluding change in operating expenses service activities.

(3) Indexed adjustment of TURPE 5 distribution tariff of +3.04% and +2.75% and the TURPE 5 transport tariff of +2.16% and -1.08% at 1 August 2019 and 1 August 2020 respectively.

(4) The capital gain recorded also includes the revaluation of securities retained following the loss of control of the company.

5.1.4.2.2.5 Framatome

Framatome's EBITDA amounted to €534 million in 2020, *i.e.* an organic increase of 0.8% despite the effects of the health crisis. Framatome's performance contributed €271 million to Group EBITDA, reflecting organic growth of nearly 5% compared with 2019.

The resilience of production of fuel assemblies (in France, Germany and the United States), as well as an improved sales mix compared to 2019 generated this rebound in EBITDA. This growth and the pursuit of the plan to reduce operational and structural costs supported Framatome's results.

The health crisis impacted the 'Installed Base' and 'Projects and Component Manufacturing' businesses for a total estimated amount of -€47 million.

One of the main achievements for Framatome in 2020 was the signature of an agreement with Rolls-Royce with a view to acquire its Civil Nuclear Instrumentation and Control (I&C) business, which would allow it to strengthen its engineering expertise and command control capabilities.

5.1.4.2.2.6 United Kingdom

EBITDA of **United Kingdom** was up 9.8% in organic terms to €823 million, despite the impact of the health crisis on the back of a positive price effect.

The health crisis has had an overall negative impact on EBITDA of -€182 million, due mainly to the drop in consumption of the portfolio of industrial and professional customers and to the increase in bad debt risks on trade receivables.

Excluding the impact of the health crisis, EBITDA would have increased by 33.4%.

EBITDA was penalised by the decline in nuclear output [1] in 2020, primarily due to Hinkley Point B outage for graphite inspection. Hunterston B came back to service in September whereas Dungeness B is still offline to date. By contrast, EBITDA benefited from higher nuclear realised prices (+£10.3/MWh).

The residential customer segment margin improved, despite a declining customer portfolio in an environment that remains highly competitive.

5.1.4.2.2.7 Italy

EBITDA of **Italy** was up 8.4% despite the effects of the health crisis, totalling €683 million. The resilience against the Covid epidemic was primarily related to the strong upstream/downstream integration business in Italy.

EBITDA for electricity activity was up, thanks to a better contribution from renewable output (hydro and wind) and the performance of services provided to the electricity system thanks to the optimisation of flexibility of the fleet.

For gas businesses, EBITDA benefited from better optimisation thanks to supply contracts flexibility by gas pipelines in a volatile context.

Sales and marketing activities benefited from improved margins on electricity sales to residential and industrial customers, and growth in services to residential customers. However, mild weather conditions at the start of the year had an unfavourable effect on gas margins.

The health crisis impacted Italy's EBITDA for an estimated amount of -€60 million, mainly due to the fall in demand from industrial customers (gas, electricity and services).

The disposal of the majority of the hydrocarbon Exploration & Production (E&P) activities, outside Algeria and Norway and the forthcoming disposal of the E&P business in Norway [2], following the end-December 2020 signature of an agreement, enabled a refocusing on strategic activities.

5.1.4.2.2.8 Other international

EBITDA of **Other international** was up 20.9% organically to €380 million despite sanitary crisis.

In **Belgium** [3], EBITDA was up 18.9% in organic terms. EBITDA growth was driven by better generation of the nuclear fleet and more favourable price effects than in 2019. Overall, 2020 benefited from a strong performance in wind farm generation (+26%), thanks to favourable wind conditions and the development of installed capacity. Net installed wind capacity increased to 548MW [4], *i.e.* +13.5% compared to end-2019. The health crisis had an unfavourable impact on EBITDA estimated at -€26 million due to the decline in consumption and service activities, and the increase of bad debt risks on trade receivable. Luminus continued its development strategy in Belgium, signing an agreement with a view to acquire Essent Belgium [5] (portfolio of *circa* 330,000 electricity and gas customers).

In **Brazil**, EBITDA was up 16.7% in organic terms, mainly related to the revaluation in 2019 and 2020 of the Power Purchase Agreement (PPA) for the EDF Norte Fluminense power plant. This growth was penalised by an unfavourable foreign exchange effect (depreciation of the Brazilian Real against the Euro). The effect of the health crisis in Brazil was non-significant given the Group's activities in this country.

5.1.4.2.2.9 Other activities

EBITDA of **Other activities** declined by 44.8% organically to €261 million.

The gas business was affected by a provision for onerous contracts recorded mainly due to the downward revision of medium- and long-term spreads between the US and Europe.

EDF Trading's EBITDA amounted to €633 million, down 11.2% in organic terms compared to an exceptional year in 2019. Against a backdrop of uncertainty related to the crisis and volatility, performances in the trading activities remained robust, generating good 2020 earnings. EBITDA also benefited from the increase in hedging activities, as well as the LNG optimization activities. The health crisis had a limited impact on trading margins.

(1) Sizewell B output was reduced between May and September 2020 at the request of National Grid. The 2.1TWh loss output has been financially compensated at the EBITDA level.

(2) See Edison's 30 December 2020 press release.

(3) Luminus and EDF Belgium.

(4) Net capacity at Luminus perimeter. Gross installed wind capacity amounted to 588MW at end-December 2020 (+13.3%).

(5) See Luminus' press release of 5 February 2021.

5.1.4.3 Operating profit (EBIT)

The Group's consolidated **EBIT** for 2020 amounted to €3,875 million, down by €2,882 million (-42.7%) from 2019, with an organic decrease of €2,810 million (-41.6%).

(in millions of euros)	2020	2019 [1]	Variation	Variation (%)
EBITDA	**16,174**	**16,723**	**(549)**	**-3.3**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	(175)	642	(817)	-127.3
Net depreciation and amortisation [2]	(10,838)	(10,020)	(818)	+8.2
(Impairment)/reversals	(799)	(403)	(396)	+98.3
Other income and expenses	(487)	(185)	(302)	+163.2
EBIT	**3,875**	**6,757**	**(2,882)**	**-42.7**

(1) The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Including net increases to provisions for replacement of concession assets.

5.1.4.3.1 Net changes in fair value on Energy and Commodity derivatives, excluding trading activities

The net changes in fair value on Energy and Commodity derivatives, excluding trading activities, fell from €642 million in 2019 to -€175 million in 2020, a change of €817 million that is in line with EDF Trading's operations on behalf of EDF entities and Edison's gas positions.

5.1.4.3.2 Net depreciation and amortisation

Net depreciation and amortisation increased by €818 million compared to 2019.

- The **France – Generation and supply** segment registered a €566 million increase in net depreciation and amortisation. This rise is essentially explained by the commissioning of new facilities in the nuclear fleet, and to a lesser degree by accelerated depreciation of the coal-fired fleet from 1 June 2019.
- The **France – Regulated activities** segment registered a €114 million increase in net depreciation and amortisation, principally attributable to investments in connections and network reinforcements.
- Net depreciation and amortisation in the **United Kingdom** rose by €113 million in 2020, notably due to accelerated depreciation of Hunterston B, Dungeness and Hinkley Point B.

5.1.4.3.3 Impairment/reversals

In 2020, impairment amounted to €799 million, and mainly related to impairment of nuclear activities in the United Kingdom.

5.1.4.3.4 Other income and expenses

In 2020, other income and expenses amounted to -€487 million, of which -€405 million concerned the **France – Generation and supply** segment, principally for repair work to containment penetration welds at the Flamanville 3 site [1].

In 2019, other income and expenses amounted to -€185 million. This particularly included the expense for the preferential employee shareholding offer which took place during the first half of 2019 (see note 15 to the 2019 consolidated financial statements) and restructuring provisions in certain Group entities.

5.1.4.4 Financial result

(in millions of euros)	2020	2019*	Variation	Variation (%)
Cost of gross financial indebtedness	(1,610)	(1,806)	196	-10.9
Discount effect	(3,733)	(3,161)	(572)	+18.1
Other financial income and expenses	2,761	4,603	(1,842)	-40.0
Financial result	**(2,582)**	**(364)**	**(2,218)**	**n.a**

n.a: not applicable

* *The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).*

(1) Recognised in accordance with IAS 16.22 concerning abnormal costs incurred in connection with self-constructed assets. These costs affect the EDF net income but have no impact on net income excluding non-recurring items.

The financial result for 2020 is a financial expense of €2,582 million, €2,218 million more than in 2019. This change is explained by:

- a decrease of €1,842 million in other financial income and expenses, driven mainly by the change in the fair value of the dedicated asset portfolio: this reflects a lower performance by the equity and credit fund markets after the exceptional performance in 2019, despite the good performance by these assets during the Covid-19 pandemic (+€1,218 million change in fair value in 2020 compared to +€2,545 million in 2019, a decrease of €1,327 million);
- an increase of €572 million in the discount effect, due to the larger decrease in discount rates due principally to the impact of lower market rates on the discount rate used for nuclear provisions in France. As of 31 December 2020, the method for calculating discount rates changed (see note 15.1.1.5 to the 2020 consolidated financial statements). The discount rate at 31 December 2020 was 3.3%, assuming inflation of 1.2% (respectively 3.7% and 1.4% at 31 December 2019), such that the reduction in the real rate was 0.2% in 2020 compared to 0.1% in 2019);
- a €196 million decline in the cost of gross financial indebtedness, due to debt repayments and bond issues at more favourable rates, as well as favourable foreign exchange effects net of hedging.

5.1.4.5 Income taxes

Income taxes amounted to -€945 million in 2020, corresponding to an effective tax rate of 73.10% (compared to -€1,532 million in 2019 corresponding to an effective tax rate of 23.96%).

The €587 million decrease in the Group's tax charge between 2019 and 2020 essentially reflects the €5,100 million decrease in net income before taxes, which led to a €1,633 million decrease in the tax charge that was partly offset by:

- the unfavourable effect of the increase in the UK tax rate from 17% to 19%;
- the absence in 2020 of any favourable effect due to asset disposals (after the Alpiq and NnG sales in 2019);
- the unfavourable decision by France's Council of State in December 2020 challenging the tax-deductibility of certain long-term liabilities of EDF SA, which has an impact of -€177 million, and unrecognised deferred tax assets with an impact of -€361 million due to the conservative approach applied by the Group to deferred assets over a horizon beyond 10 years.

After eliminating non-recurring items (mainly the consequences of tax litigation, changes in unrealised gains and losses on the financial asset portfolio, impairment and the impacts of changes in the UK tax rate), the effective tax rate in 2020 was 19.0% (18.0% in 2019).

5.1.4.6 Share in net income of associates and joint ventures

The Group's share in net income of associates and joint ventures was a positive €425 million in 2020 compared to €818 million in 2019, a decrease of €393 million resulting from the income of CENG, which amounted to €63 million at 31 December 2020, €225 million less than in 2019.

The share in net income of associates and joint ventures in 2020 includes impairment totalling €189 million. Details of this impairment are given in note 12 to the 2020 consolidated financial statements, "Investments in associates and joint ventures".

5.1.4.7 Net income of discontinued operations

The net income of discontinued operations comprises items from the income statement of Edison's E&P operations (excluding Algeria and Norway), and impairment on the relevant assets (see note 3.2 to the 2020 consolidated financial statements).

5.1.4.8 Net income attributable to non-controlling interests

Net income attributable to non-controlling interests amounted to -€35 million in 2020, €62 million lower than in 2019.

5.1.4.9 EDF net income

EDF net income totalled €650 million for 2020, €4,505 million lower than in 2019, due notably to losses included in EBIT (-€2,882 million) and financial result (-€2,218 million).

	2020	2019*
GROUP EARNINGS PER SHARE *(IN EUROS)*		
Basic earnings per share	0.05	1.50
Diluted earnings per share	0.05	1.50
Earnings per share of continuing operations	0.10	1.67
Diluted earnings per share of continuing operations	0.10	1.67

* *The published figures for 2019 have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).*

5.1.4.10 Net income excluding non-recurring items

The Group's net income excluding non-recurring items [1] stood at €1,969 million in 2020, down by €1,902 million compared to 2019 (see note 19.1, Net income excluding non-recurring items, to the 2020 consolidated financial statements.

(1) EDF net income excluding non-recurring items, net changes in fair value on energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.
Amount of non-recurring items, net changes in fair value on energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax:
-€2,068 million of impairment and other non-recurring items in 2020, compared to -€986 million in 2019;
-€124 million of net changes in the fair value of energy and commodity derivatives (excluding trading activities) net of tax in 2020, compared to +€490 million in 2019; +€873 million of net changes in the fair value of debt and equity instruments in 2020 (IFRS 9), compared to +€1,780 million in 2019.

5.1.5 Cash flow and net indebtedness

For details of the cash flows in the cash flow statement, see the 2020 consolidated financial statements and the relevant notes:.

- consolidated Cash Flow Statement;
- note 10.6 "Assets in progress" and note 10.7 "Investments in intangible assets and property, plant and equipment";
- note 13 "Working capital";
- note 19 "Financial indicators" and note 19.2 "Net indebtedness".

5.1.5.1 Net indebtedness

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or securities with initial maturity of over three months that are readily convertible into cash and are managed according to a liquidity-oriented policy.

The Group's net indebtedness was €42,290 million at 31 December 2020. It stood at €41,133 million at 31 December 2019.

(in millions of euros)	2020	2019 [1]	Variation	Variation (%)
Operating profit before depreciation and amortisation (EBITDA)	**16,174**	**16,723**	**(549)**	**-3.3**
Cancellation of non-monetary items included in EBITDA	328	(1,930)		
Cash EBITDA	**16,502**	**14,793**		
Change in working capital	(1,679)	475		
Net investments [2] (excluding 2019-2020 disposals and the Hinkley Point C and Linky projects)	(11,570)	(11,433)		
Other items including dividends received from associates and joint ventures	(17)	303		
Operating cash flow [3]	**3,236**	**4,138**	**(902)**	**-21.8**
Asset disposals	187	531		
Income taxes paid	(983)	(915)		
Net financial expenses disbursed	(1,008)	(802)		
Dedicated assets	(798)	(394)		
Dividends paid in cash	(768)	(801)		
Cash flow before the Hinkley Point C and Linky projects	**(134)**	**1,757**		
Hinkley Point C and Linky projects	(2,575)	(2,582)		
Group cash flow [4]	**(2,709)**	**(825)**		
Issues of hybrid notes and OCEANE bonds	2,243	493		
Redemption of hybrid notes	-	(1,618)		
Other monetary changes	(49)	(470)		
(Increase)/decrease in net indebtedness, excluding the impact of changes in exchange rate	**(515)**	**(2,420)**		
Effect of change in exchange rates	445	(341)		
Effect of other non-monetary changes	(1,077)	(5,039)		
(Increase)/decrease in net indebtedness of continuing operations	**(1,147)**	**(7,800)**		
(Increase)/decrease in net indebtedness of discontinued operations [5]	**(10)**	**55**		
Net indebtedness at beginning of year	**41,133**	**33,388**		
NET INDEBTEDNESS AT END OF YEAR	**42,290**	**41,133**		

(1) The published figures for 2019 (except NFD) have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Net investments are operating investments and financial investments for growth, net of disposals. They also include net debts acquired or transferred in acquisitions or disposals of securities, investment subsidies received, and non-Group partner investments. They do not include the 2019-2020 disposals or investments in the Hinkley Point C and Linky projects.

(3) Operating cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not directly comparable with indicators of the same name reported by other companies. This indicator, also known as Funds From Operations ("FFO"), is equivalent to net cash flow from operating activities, changes in working capital after adjustment where relevant for the impact of non-recurring effects, net investments (excluding 2019-2020 disposals and investments in the Hinkley Point C and Linky projects), and other items, including dividends received from associates and joint ventures.

(4) Group cash flow is not an aggregate defined by IFRS as a measure of financial performance and is not directly comparable with indicators of the same name reported by other companies. It is equal to the operating cash flow defined in note (2) above less asset disposals, income taxes paid, net financial expenses disbursed, net allocations to dedicated assets, dividends paid in cash and investments in the Hinkley Point C and Linky projects.

(5) This corresponds to the net indebtedness of Edison's discontinued E&P operations that are currently in the process of sale.

(in millions of euros)	31/12/2020	31/12/2019	Variation	Variation (%)
Loans and other financial liabilities	65,591	67,380	(1,789)	-2.7
Derivatives used to hedge liabilities	(1,986)	(3,387)	(1,401)	-41.4
Cash and cash equivalents	(6,270)	(3,934)	2,336	+59.4
Debt and equity securities – liquid assets	(15,028)	(18,900)	(3,872)	-20.5
Net indebtedness of assets held for sale	(17)	(26)	(9)	-34.6
NET INDEBTEDNESS*	**42,290**	**41,133**	**1,157**	**+2.8**

* *Net indebtedness is not defined in the accounting standards and is not directly visible in the Group's consolidated balance sheet.*

5.1.5.1.1 Operating cash flow [1]

The operating cash flow [1] amounted to €3,236 million in 2020 compared to €4,138 million in 2019, a decrease of €902 million.

5.1.5.1.1.1 Cash EBITDA

EBITDA adjusted for non-cash items amounted to €16,502 million, up by €1,709 million from 2019, mainly due to settlements of underlying positions on EDF Trading's financial instruments, and to a lesser extent, to the higher gross margin on deliveries by Enedis.

5.1.5.1.1.2 Change in working capital

Working capital deteriorated by -€1,679 million in 2020.

This change was mainly due to the higher stocks of capacity certificates and energy savings certificates, and the increase in margin calls in the optimisation/trading activity in 2020.

The difference between the 2019 and 2020 change in working capital (-€2,154 million) is essentially explained by the increase in stocks (-€898 million) and the increase in margin calls in the optimisation/trading activity (-€1,235 million).

5.1.5.1.1.3 Net investments (excluding 2019-2020 disposals and the Hinkley Point C and Linky projects)

Net investments including 2019-2020 disposals, and the Hinkley Point C and Linky projects amounted to €14.1 billion in 2020.

Net investments (excluding 2019-2020 disposals and the Hinkley Point C and Linky projects) amounted to €11,570 million in 2020 compared to €11,433 million in 2019, an increase of €137 million. Details are as follows:

(in millions of euros)	2020	2019*	Variation	Variation (%)
France – Generation and supply	5,484	6,329	(845)	-13.4
France – Regulated activities	3,367	3,622	(256)	-7.0
EDF Renewables	812	(276)	1,089	+394.2
Dalkia	180	138	42	+30.4
Framatome	219	134	85	+63.4
United Kingdom	732	659	73	+11.1
Italy	531	433	98	+22.6
Other international	207	309	(102)	-33.0
Other activities	38	86	(48)	-55.8
NET INVESTMENTS	**11,570**	**11,433**	**137**	**+1.2**

* *The published figures for 2019 (except NFD) have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).*

- Net investments by the **France – Generation and supply** segment decreased by €845 million, due to lower nuclear maintenance expenses, lower investments in the Flamanville 3 project, and the acquisition of Framatome in 2019.
- Net investments by the **France – Regulated activities** segment, excluding Linky, were down by -€256 million as a result of the Covid-19 pandemic which led to postponement or cancellation of certain work, despite Enedis' swift resumption of activity after the end of the first national emergency period.
- Net investments by **EDF Renewables** were up by €1,089 million. Investments in 2019 were reduced by the sale of the NnG wind farm, an operation with no equivalent in 2020.
- In the **United Kingdom**, net investments rose by €73 million despite the lower expenditure on nuclear maintenance work, and essentially concerned the acquisition of Pod Point in the electric mobility sector and the financing of the Sizewell and Bradwell nuclear projects.
- In **Italy**, net investments increased by €98 million, notably due to thermal power plant development projects.

5.1.5.1.2 Cash flow before the Hinkley Point C and Linky projects

The cash flow before the Hinkley Point C and Linky projects was amounting to -€134 million in 2020 (compared to €1,757 million in 2019).

5.1.5.1.2.1 Asset disposals

Asset disposals generated €187 million in 2020, and principally concerned the sale of Edison's Exploration & Production operations.

5.1.5.1.2.2 Dedicated assets

In compliance with the French Law no. 2006-739 of 28 June 2006 on the sustainable management of radioactive materials and waste, EDF has built up a portfolio of dedicated assets for secure financing of its long-term nuclear obligations (see section 7.1.6).

Overall, the changes in dedicated assets comprise:

- allocations to reach full coverage of obligations;
- reinvestment of financial income (dividends and interest) generated by these assets;

(1) Excluding the 2019/2020 asset disposal plan and investments in the Hinkley Point C and Linky projects.

- withdrawals of assets corresponding to the costs incurred over the period to meet long-term nuclear obligations falling within the scope of the Law of 28 June 2006;
- exceptional withdrawals proposed to the governance bodies in charge of managing dedicated assets when the value of the portfolio exceeds the amount of the obligations to be financed; such withdrawals must be validated by these bodies.

The net change of -€798 million in dedicated assets in 2020 corresponds to the first three of these categories.

5.1.5.1.2.3 Dividends paid in cash

In 2020, EDF paid out €768 million, comprising:

- payments made in 2020 to bearers of perpetual subordinated bonds for the "hybrid" bond issues of January 2013 and January 2014 (€501 million);
- dividends paid by Group subsidiaries to their minority shareholders (€267 million).

EDF paid no dividend in 2020 (neither the balance of the 2019 dividend, nor an interim dividend for 2020) (see the press release of 7 May 2020).

5.1.5.1.3 Group cash flow

The Group cash flow amounted to -€2,709 million for 2020, versus -€825 million for 2019.

5.1.5.1.4 Effect of change in exchange rates

The foreign exchange effect (mainly the decline of the pound sterling and the US dollar against the euro [1]) had a favourable impact of €445 million on the Group's net indebtedness at 31 December 2020.

5.1.5.1.5 Other non-monetary changes

Other non-monetary changes had an effect of -€1,077 million in 2020, compared to -€5,039 million in 2019, and mainly comprise changes in the fair value of debt instruments and new leases (IFRS 16). The €3,962 million change from 2019 is principally explained by the first application of IFRS 16 in 2019.

5.1.5.2 Financial ratios

	2020	2019 [1]	2018
Net indebtedness/EBITDA	2.61	2.46	2.24
Net indebtedness/(Net indebtedness + equity) [2]	43%	42%	39%

(1) The published figures for 2019 (except NFD) have been restated for the impact of the change in the scope of the E&P disposal (see note 1.4.2 to the 2020 consolidated financial statements).

(2) Equity including non-controlling interests.

5.1.6 Management and control of market risks

5.1.6.1 Management and control of financial risks

This section sets forth the policies and principles for management of the Group's financial risks defined in the Strategic financial management framework (liquidity, interest rate, foreign exchange rate and equity risks), and the Group counterparty risk management policy set up by the EDF group. These principles apply only to EDF and operationally controlled subsidiaries or subsidiaries that do not benefit by law from specific guarantees of independent management such as Enedis. In compliance with IFRS 7, the following paragraphs describe the nature of risks resulting from financial instruments, based on analyses of sensitivities and credit (counterparty) risks.

Since 2002, a dedicated body – the Financial Risks Control Department (*Département Contrôle des Risques Financiers et Investissements – CRFI*) – has been in charge of financial risk control at Group level, mainly by ensuring correct application of the principles of the Strategic Financial Management Framework (July 2015). This department, which has reported to the Group's Risk Division since 2008, is an independent unit that also has the task of carrying out a second-level check of the risk of counterparty default (methodology and organisation) for EDF entities and operationally controlled Group subsidiaries (excluding Enedis), and a first-level check of financing activities by EDF SA's Trading room. The CRFI Department also carries out a second-level check of management activities concerning the dedicated asset portfolio.

The CRFI Department issues daily and weekly monitoring reports of risk indicators relevant to activities in EDF SA's trading room.

Regular internal audits are carried out to ensure controls are actually applied and are effective.

5.1.6.1.1 Liquidity position and management of liquidity risk

5.1.6.1.1.1 Liquidity position

At 31 December 2020, the Group's liquidities, consisting of liquid assets, cash and cash equivalents, totalled €21,316 million and available credit lines amounted to €11,110 million.

The Group's debt repayments (principal and interest) for 2021 are forecast at 31 December 2020 at €11,460 million, including €4,294 million for bonds (excluding hybrid bonds).

No Group company was in default on any borrowing at 31 December 2020.

5.1.6.1.1.2 Management of liquidity risk

On 8 September 2020, EDF made an offering of green bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). These bonds mature in 2024 and the nominal amount of the issue was around €2.4 billion.

Details of the Group's bond borrowings are given in note 18.3.2 to the 2020 consolidated financial statements "Loans and other financial liabilities".

The average maturity of the Group's gross debt was 14.5 years at 31 December 2020, compared to 15.4 years at 31 December 2019. For EDF SA, the average maturity was 15.0 years at 31 December 2020, against 15.9 years at 31 December 2019.

(1) The pound sterling fell by 5.4% against the Euro, from €1.175/£1 at 31 December 2019 to €1.112 /£1 at 31 December 2020;
The US dollar fell by 8.5% against the Euro, from €0.89/$1 at 31 December 2019 to €0.815/$1 at 31 December 2020.

At 31 December 2020, the residual maturities of financial liabilities (including interest payments) are as follows under IFR 9 (valued on the basis of exchange and interest rates at 31 December 2020):

31 December 2020 *(in millions of euros)*	Debt	Hedging instruments*		Guarantees given on borrowings
		Interest rate swaps	Currency swaps	
2020	13,386	(318)	(362)	51
2021 - 2024	22,355	(1,069)	(1,334)	495
2025 and later	73,234	(1,179)	(5,356)	403
TOTAL	**108,975**	**(2,566)**	**(7,052)**	**949**
debt repayment (Principal)	64,371			
interest	44,604			

* *Data on hedging instruments include both assets and liabilities.*

The EDF group was able to meet its financing needs by conservative liquidity management and has obtained financing on satisfactory terms.

A range of specific levers are used to manage the Group's liquidity risk:

- the Group's cash pooling system, which centralises cash management for controlled subsidiaries. The subsidiaries' cash balances are made available to EDF SA in return for interest, so as to optimise the Group's cash management and provide subsidiaries with a system that guarantees them market-equivalent financial terms;
- centralisation of financing for controlled subsidiaries at the level of the Group's Cash Management Department. Changes in subsidiaries' working capital are financed by this department in the form of stand-by credit lines provided for subsidiaries, which may also be granted revolving credit from the Group. EDF SA and the investment subsidiary EDF Investissements Groupe (EDF IG), set up in partnership with the bank Natixis Belgique Investissements, also provide medium and long-term financing for EDF group operations outside France, arranged by EDF SA and EDF IG on a totally independent basis: each company sets its own terms, which are the same as the subsidiary would have in an arm's-length market transaction;
- active management and diversification of financing sources used by the Group: the Group has access to short-term resources on various markets through programmes for French commercial paper and US commercial paper. For EDF, the ceilings for these programmes are €6 billion for the NEU CP programmes and $10 billion for its US commercial paper;
- transfer of bond liabilities to banking counterparties under cash repurchase agreements;
- analyses of liquidity requirements were updated during the crisis of March and at 30 June 2020, indicating potentially higher requirements due to the consequences of the Covid-19 pandemic. EDF decided to transfer securities under repurchase agreements during the crisis in March, creating substantial liquidities. These agreements were gradually terminated from the summer onwards.

At 31 December 2020, the amount of the Group's commercial paper outstanding was €2,071 million for French commercial paper, and US$263 million for US commercial paper. EDF has access to the world's main bond markets: the Euro markets through its EMTN programme, which currently has a ceiling of €45 billion, particularly for Euro and sterling issues; and the domestic markets used for stand-alone issues in US dollars (144A bonds), yen (Samurai bonds) and Swiss francs.

Details of the Group's main borrowings at 31 December 2020 are provided in note 18.3.2.2 to the 2020 consolidated financial statements.

At 31 December 2020, EDF SA has an overall amount of €10,344 million in available credit facilities (syndicated credit and bilateral lines):

- the syndicated credit line amounts to €4 billion and expires in December 2025. No drawings had been made on this syndicated credit line at 31 December 2020;
- bilateral lines represent an available amount of €5,944 million, with expiry dates extending to June 2024. The level of this available financing is very frequently reviewed to ensure the Group has sufficient backup credit facilities;
- the amount available from the credit lines with the European Investment Bank is €400 million. Four of the five credit lines were fully drawn at 31 December 2020 for amounts of €500 million, €225 million, €500 million and €250 million.

Edison has a credit line with the European Investment Bank for €689 million (available amount €400 million) and a credit line with a pool of banks for €130 million, which was drawn to the extent of €100 million at 31 December 2020.

5.1.6.1.2 Credit rating

At 31 December 2020, the financial ratings agencies Standard & Poor's, Moody's and Fitch Ratings attributed the following long-term and short-term ratings to EDF group entities:

Company	Agency	Long-term rating	Short-term rating
EDF	Standard & Poor's	BBB+, stable outlook	A-2
	Moody's	A3, negative outlook	P-2
	Fitch Ratings	A-, negative outlook	F2
EDF Trading	Moody's	Baa2, negative outlook	n. a.
EDF Energy	Standard & Poor's	BB+, stable outlook	B
Edison	Standard & Poor's	BBB-, stable outlook	A-3
	Moody's	Baa3, positive outlook	n. a.

n. a.: not applicable.

5.1.6.1.3 Management of foreign exchange risk

Due to the diversification of its activities and geographical locations, the Group is exposed to the risk of exchange rate fluctuations, which may have an impact on the translation differences affecting balance sheet items, Group financial expenses, equity, net income and the IRR of projects.

To limit exposure to foreign exchange risks, the Group has introduced the following management principles:

- local currency financing: to the extent possible given the local financial markets' capacities, each entity finances its activities in its own functional currency. When financing is contracted in other currencies, derivatives may be used to limit foreign exchange risk;
- matching of assets and liabilities: the net assets of subsidiaries located outside the Euro zone expose the Group to a foreign exchange risk. The foreign exchange risk in the consolidated balance sheet is managed by market hedging involving use of financial derivatives. Hedging of net assets in foreign currencies complies with risk/return targets, and the hedging ratio varies depending on the currency, ranging from 46% to 67% for the principal exposures. If no hedging instruments are available, or if hedging costs are prohibitive, the foreign exchange positions remain open and the risk on such positions is monitored by sensitivity calculations;
- hedging of operating cash flows in foreign currencies: in general, the operating cash flows of EDF and its subsidiaries are in the relevant local currencies, with the exception of flows related to fuel purchases which are primarily in US dollars, and certain flows related to purchases of equipment, which concern lower amounts. Under the principles laid down in the Strategic financial management framework, EDF and the main subsidiaries concerned by foreign exchange risks (EDF Energy, EDF Trading, Edison, EDF Renewables) are required to hedge firm or highly probable commitments related to these future operating cash flows.

As a result of the financing and foreign exchange risk hedging policy, the Group's gross debt at 31 December 2020 breaks down as follows by currency after hedging:

GROSS DEBT STRUCTURE BY CURRENCY BEFORE AND AFTER HEDGING

31 December 2020 *(in millions of euros)*	**Initial debt structure**	**Impact of hedging instruments***	**Debt structure after hedges**	**% of debt**
Borrowings in EUR	36,241	11,798	48,039	73%
Borrowings in USD	16,735	(10,958)	5,777	9%
Borrowings in GBP	9,996	537	10,533	16%
Borrowings in other currencies	2,619	(1,377)	1,242	2%
TOTAL DEBT	**65,591**	**-**	**65,591**	**100%**

* *Hedges of liabilities and net assets of foreign subsidiaries.*

The table below presents the impact on equity of a variation in exchange rates on the Group's gross debt at 31 December 2020.

EXCHANGE RATE SENSITIVITY OF THE GROUP'S GROSS DEBT

31 December 2020 *(in millions of euros)*	**Debt after hedging instruments converted into euros**	**Impact of a 10% unfavourable variation in exchange rates**	**Debt after a 10% unfavourable variation in exchange rates**
Borrowings in EUR	48,039	-	48,039
Borrowings in USD	5,777	578	6,355
Borrowings in GBP	10,533	1,053	11,586
Borrowings in other currencies	1,242	124	1,366
TOTAL DEBT	**65,591**	**1,755**	**67,346**

Due to the Group's hedging policy for foreign exchange risk on the Group's gross debt, the income statement for companies controlled by the Group is marginally exposed to foreign exchange rate risk.

The table below sets forth the foreign exchange position relating to net assets in foreign currencies of the Group's subsidiaries.

NET ASSET POSITION

31 December 2020* *(in millions of currency units)*	**Net assets**	**Bonds**	**Derivatives**	**Net assets after management**
USD	5,872	1,500	2,449	1,923
CHF (Switzerland)	30		28	2
PLN (Poland)	285		153	132
GBP (United Kingdom)	19,635	5,435	3,522	10,678
BRL (Brazil)	1,371			1,371
CNY (China)	11,026			11,026

* *Net assets as at 31 December 2020; bonds and derivatives as at 31 December 2020. The net positions shown exclude certain non-significant exposures.*

The above table shows the assets of the Group's foreign subsidiaries in foreign currencies, adjusted for changes in the fair value of cash flow hedges and of debt and equity instruments recorded in equity, and changes in the fair value of financial instruments recorded in income.

The following table sets forth the risk for equity of foreign exchange losses on net assets in foreign currencies of the Group's principal subsidiaries at 31 December 2020, assuming unfavourable, uniform exchange rate variations of 10% against the Euro. Net assets are converted at the closing rate and impacts are reported in absolute value.

EXCHANGE RATE SENSITIVITY OF NET ASSETS

	At 31 December 2020			At 31 December 2019		
(in millions of currency units)	Net assets after management into currency	Net assets after management converted into euros	Impact on equity of a 10% variation in exchange rates	Net assets after management into currency	Net assets after management converted into euros	Impact on equity of a 10% variation in exchange rates
USD	1,923	1,567	157	789	702	70
CHF (Switzerland)	2	2	-	1	1	-
PLN (Poland)	132	29	3	141	33	3
GBP (United Kingdom)	10,678	11,877	1,188	11,778	13,843	1,384
BRL (Brazil)	1,371	215	22	1,202	266	27
CNY (China)	11,026	1,374	137	11,148	1,425	143

The foreign exchange risk on available-for-sale securities is mostly concentrated in EDF's dedicated asset portfolio, which is discussed in section 7.1.6 "Management of financial risk on EDF SA's dedicated asset portfolio".

The foreign exchange risk associated with short-term investments and operating liabilities in foreign currencies remains controlled for the Group at 31 December 2020.

5.1.6.1.4 Management of interest rate risk

The exposure of the Group's net indebtedness to interest rate fluctuations covers two types of risk: a risk of change in the net financial expenses on floating-rate financial assets and liabilities, and a risk of change in the value of financial assets invested at fixed rates. These risks are managed by monitoring the floating-rate portion of net indebtedness, defined by reference to the risk/return for net financial expenses, taking into consideration expected movements in interest rates.

Some of the debt is variabilised and the Group may use interest rate derivatives for hedging purposes. The distribution of exposure between fixed and floating rates is monitored.

The Group's debt after hedging instruments at 31 December 2020 comprised 69.3% at fixed rates and 30.7% at floating rates.

A 1% uniform annual rise in interest rates would generate an approximate €200 million increase in financial expenses at 31 December 2020, based on gross floating-rate debt after hedging.

The average cost of Group debt (weighted interest rate on outstanding amounts) was 2.32% at the end of 2020.

The table below sets forth the structure of Group debt and the impact of a 1% variation in interest rates at 31 December 2020.

STRUCTURE AND INTEREST RATE SENSITIVITY OF GROUP DEBT

31 December 2020 *(in millions of euros)*	Initial debt structure	Impact of hedging instruments	Debt structure after hedging	Impact on income of a 1% variation in interest rates
Fixed rate	60,667	(15,217)	45,450	-
Floating rate	4,924	15,217	20,141	201
TOTAL	**65,591**	**-**	**65,591**	**201**

Concerning financial assets, the table below presents the interest rate risk on the floating-rate notes (FRN) held by EDF, and their sensitivity to interest rate risks (impact on net income).

INTEREST RATE SENSITIVITY OF FLOATING-RATE INSTRUMENTS

31 December 2020 *(in millions of euros)*	Value	Impact on income of a 1% variation of interest rates	Value after a 1% variation in interest rates
FLOATING-RATE INSTRUMENTS	**1,202**	**(12)**	**1,190**

The Group's interest rate risk notably relates to the value of the Group's long-term nuclear obligations (see note 15 to the 2020 consolidated financial statements) and its pension and other specific employee benefit obligations (see note 16 to the 2020 consolidated financial statements), which are adjusted to present value using discount rates that depend on interest rates at various time horizons, and debt securities held in connection with the management of the dedicated assets set aside to cover these obligations (see section 5.1.6.1.6 "Management of financial risk on EDF's dedicated asset portfolio").

5.1.6.1.5 Management of equity risks

The equity risk is concentrated in the following areas:

Coverage of EDF's nuclear obligations

Analysis of the equity risk is presented in section 7.1.6 "Management of financial risk on EDF SA's dedicated asset portfolio".

Coverage of employee benefit obligations for EDF SA, EDF Energy and British Energy

Assets covering EDF's employee benefit liabilities are partly invested on the international and European equities markets. Market trends therefore affect the value of these assets, and a downturn in equity prices would lead to a rise in balance sheet provisions.

34% of the assets covering EDF's employee benefit obligations were invested in equities at 31 December 2020, representing an amount of €4.5 billion of equities.

At 31 December 2020, the two pension funds sponsored by EDF Energy (EDF Energy Pension Scheme and EDF Energy Group Electricity Supply Pension Scheme) were invested to the extent of 7.9% in equities and 9.1% in equities and equity funds, representing an amount of £217 million of equities.

At 31 December 2020, the British Energy pension funds were invested to the extent of 11.5% in equities and equity funds, representing an amount of £881 million of equities.

CENG fund

CENG is exposed to equity risks in the management of its funds established to cover nuclear decommissioning expenses.

5.1.6.1.6 Management of financial risk on EDF's dedicated asset portfolio

Dedicated assets have been built up progressively by EDF since 1999 for secure financing of its long-term nuclear obligations. The Law of 28 June 2006 and its implementing regulations defined provisions not related to the operating cycle, which must therefore be covered by dedicated assets; they are listed in note 15.1.2 to the 2020 consolidated financial statements, "EDF's dedicated assets".

The dedicated asset portfolio is managed under the supervision of the Board of Directors and its advisory committees (Nuclear Commitments Monitoring Committee (CSEN), Audit Committee).

A **Nuclear Commitments Financial Expertise Committee (CEFEN)** exists to assist the Company and its governance bodies on questions of matching assets and liabilities and asset management. The members of this Committee are independent of EDF.

Governance and management principles

The governance principles setting forth the structure of dedicated assets, and the relevant decision-making and control processes for their management, are validated by EDF's Board of Directors. These principles also lay down rules for the asset portfolio's structure, selection of financial managers, and the legal, accounting and tax structure of the funds.

Strategic asset allocation is based on asset/liability reviews carried out to define the most appropriate target portfolio for financing long-term nuclear expenses. Strategic allocation is validated by EDF's Board of Directors and reviewed every three years unless circumstances require otherwise. A new strategic allocation was validated in 2018. This target allocation consists of a yield portfolio, a growth portfolio and a fixed-income portfolio, respectively accounting for 30%, 40% and 30% of the total portfolio. The yield portfolio consists of real estate assets and infrastructure assets; the growth portfolio consists of equities and equity funds (both listed and unlisted); the fixed-income portfolio consists of bonds, debt funds (both listed and unlisted), and cash. These portfolios are managed by the Listed Asset Management Division and by EDF Invest.

The "cash" pocket of the portfolio exists to provide secure coverage for future disbursements related to the purpose of the asset covered, and may be reinforced tactically, particularly when a conservative approach is required in the event of a market crisis.

The CSPE receivable allocated to dedicated assets on 13 February 2013 was totally repaid and cleared at 31 December 2020 (see note 15.1.2 to the 2020 consolidated financial statements).

Tactical management of the growth assets and fixed-income assets has several focal areas:

- monitoring of exposure between growth assets and fixed-income assets;
- allocation by "secondary asset class" within each sub-portfolio;
- selection of investment funds, aiming for diversification;
- for bonds, a choice of securities held directly, through brokers, or *via* investment funds incorporating the concern for diversification.

The allocation policy between growth assets and fixed-income assets was developed by the Operational Management Committee [(1)] on the basis of the economic and financial outlook for each market and geographical area, a review of market appreciation in different markets and market segments, and risk analyses produced by the CRFI Department.

Content and performance of EDF's dedicated asset portfolio

BREAKDOWN OF THE PORTFOLIO

	31/12/2020	31/12/2019
Yield assets	19%	19.2%
Growth assets	40.5%	42.1%
Fixed-income assets	40.5%	38.7%
TOTAL	**100%**	**100%**

At 31 December 2020, the total value of the portfolio was €33,848 million compared to €31,624 million in 2019. The content of the portfolio is also presented in note 15.1.2 to the 2020 consolidated financial statements.

(1) Internal Committee and permanent body for evaluation, consultation and operational decision-making in the area of dedicated asset management.

PORTFOLIO CONTENT UNDER THE CLASSIFICATION FROM ARTICLE 4, DECREE 2007-243 OF 23 FEBRUARY 2007

Categories (in millions of euros)	31 December 2020 Net book value [1]	31 December 2020 Net book value [1]	31 December 2019 Net book value [1]	31 December 2019 Realisable value
CTE (the holding company that holds 100% of RTE) [2]	2,705	2,788	2,705	2,926
Derivatives	16	16	(10)	(10)
Other unlisted securities and shareholder loans [3]	3,329	3,616	2,826	3,164
YIELD ASSETS	**6,050**	**6,420**	**5,521**	**6,080**
Funds not exclusively invested in OECD bonds	10,765	13,174	10,865	12,978
Hedges, deposits, amounts receivable	-	188	-	46
Other unlisted securities	323	330	263	276
GROWTH ASSETS	**11,088**	**13,692**	**11,128**	**13,300**
OECD government bonds and similar	4,598	4,879	4,338	4,548
OECD corporate (non-government) bonds and negotiable debt securities	1,431	1,460	1,793	1,827
Funds investing in the above two categories [4]	6,981	7,217	4,830	5,038
CSPE	-	-	684	688
Other unlisted securities	164	155	146	142
Derivatives	32	25	5	1
FIXED-INCOME ASSETS	**13,206**	**13,736**	**11,796**	**12,244**
TOTAL DEDICATED ASSETS	**30,344**	**33,848**	**28,445**	**31,624**

(1) Net book value in the parent company financial statements.
(2) In 2020 and 2019, dedicated assets include 50.1% of Coentreprise de Transport d'Électricité (CTE).
(3) Including €155 million of shareholder loans due to be capitalised, concerning a long-term investment in a real estate vehicle controlled and managed by Korian.
(4) Including + €170 million of cash that was not reinvested in 2020.

The table below presents the performance of the portfolio at 31 December 2020 and 31 December 2019:

PERFORMANCE OF EDF'S DEDICATED ASSET PORTFOLIO

(in millions of euros)	31/12/2020 Stock market or realisable value	Performance for 2020 Portfolio	31/12/2019 Stock market or realisable value	Performance for 2019 Portfolio
Yield assets	6,420	2.3%	6,080	8.9%
Growth assets	13,692	10.3%	13,300	25.9%
Fixed-income assets	13,736	4.1%	12,244	5.2%
TOTAL DEDICATED ASSETS	**33,848**	**5.9%**	**31,624**	**13.5%**

BREAKDOWN OF PORTFOLIO PERFORMANCE UNDER THE CLASSIFICATION FROM ARTICLE 4, DECREE 2007-243 OF 23 FEBRUARY 2007

(in millions of euros)	31/12/2020 Stock market or realisable value	Performance for 2020 Portfolio	31/12/2019 Stock market or realisable value	Performance for 2019 Portfolio
CTE shares [1]	2,788	1.6%	2,926	12.6%
Other unlisted securities and shareholder loans [2] [3] [4]	4,117	2.9%	3,572	6.0%
Equity funds [3]	13,362	10.6%	13,024	26.3%
Bonds, negotiable debt instruments and bond funds [3]	12,396	4.3%	11,226	6.1%
Monetary funds	1,185	- 0.4%	188	-0.3%
CSPE	-	2.5%	688	0.6%
TOTAL DEDICATED ASSETS	**33,848**	**5.9%**	**31,624**	**13.5%**

(1) In 2020 and 2019, dedicated assets include 50.1% of Coentreprise de Transport d'Électricité (CTE).
(2) EDF Invest excluding CTE. The performance of EDF Invest including CTE is +2.3% in 2020 and +9.0% in 2019.
(3) Including derivatives.
(4) Including €155 million of shareholder loans due to be capitalised, concerning a long-term investment in a real estate vehicle controlled and managed by Korian.

Changes in the portfolio in 2020

Developments on the financial markets in 2020 are described in note 15.1.2.3 to the 2020 consolidated financial statements.

In 2020, the overall after-tax performance of dedicated assets (impacts on reserves and net income) was +€1,575 million, comprising +€237 million for the CTE shares allocated to dedicated assets, and +€1,334 million for other securities (+€1,822 million before tax).

The overall performance of the dedicated asset portfolio, comprising yield assets, growth assets and fixed-income assets, was +5.9%.

The unlisted assets managed by EDF Invest are distributed between yield assets, growth assets and fixed-income assets. This portfolio, including CTE, amounted to €6.9 billion at 31 December 2020 and generated a total annual performance of 2.3% in 2020.

EDF Invest continued to diversify this portfolio in 2020, making new investments in renewable energies (solar power plants and wind farms in the United States, Canada and Portugal), energy efficiency (smart meters in the United Kingdom), and real estate assets (offices in France and healthcare properties in Europe).

The investments in wind and solar power plants acquired by EDF SA from EDF Renewables in December 2020 were entirely allocated to dedicated assets in 2020, in addition to the €113 million allocation during the first half-year. The total allocation to dedicated assets in 2020 was €797 million (€540 million in 2019), comprising €299 million in the form of asset contributions and €498 million in cash.

The yield assets consist of unlisted real estate and infrastructure assets with a value of €6.4 billion at 31 December 2020 and generated dividends in line with expectations. However, the performance in 2020 was mitigated by a decline in the value of certain assets, particularly transport infrastructures which were affected by lockdown measures in various countries.

Thanks to an upturn on the listed markets, the growth assets pocket registered an overall performance of +10.3% (+10.6% for listed assets and +2.0% for growth funds). For listed assets, all geographical pockets outperformed their indexes, in some cases very substantially: 1.4% to 1.8% for Japan, North America and Europe, and nearly 0.5% for emerging countries and the Pacific. Finally, foreign exchange management was also profitable, particularly with significant over-coverage on the US dollar, especially in the second half-year.

The performance of fixed-income assets was satisfactory in absolute terms (+4.1%) and relative terms. The listed bond portfolio registered a performance of +4.3%, slightly above its benchmark index. In the government bond portfolio, non-core countries were also overweighted to the detriment of core countries, particularly Germany. Interest rate funds registered a performance of +1.6%.

Dedicated assets' exposure to risks

EDF is exposed to equity risks, interest rate risks and foreign exchange risks through its dedicated asset portfolio.

The market value of the listed equities in EDF's dedicated asset portfolio was €13,362 million at 31 December 2020. The volatility of the listed equities at the same date was 26.6% based on 52 weekly performances, compared to 9.2% at 31 December 2019. Applying this volatility to the value of listed equity assets at the same date, the Group estimates the annual volatility of the equities portion of dedicated assets at €3,554 million.

At 31 December 2020, the sensitivity of the listed bonds (€12,396 million) was 5.5, *i.e.* a uniform 100 base point rise in interest rates would result in a €678 million decline in market value. This sensitivity was 6.1 at 31 December 2019.

5.1.6.1.7 Management of counterparty/credit risks

Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

The Group has a counterparty risk management policy which applies to EDF and all operationally controlled subsidiaries. This policy sets out the governance associated with monitoring for this type of risk, and organisation of the counterparty risk management and monitoring. The policy also involves monthly consolidation of the Group's exposures. The CRFI (Financial Risks Control) department closely monitors Group counterparties (daily review of alerts, special cautionary measures for certain counterparties).

The table below gives details, by rating, of the EDF group's consolidated exposure to counterparty risk. At 30 September 2020, 92% of the Group's exposure concerns "investment grade" counterparties, mainly as a result of the predominance of exposures generated by the cash and asset management activity, as most short-term investments concern low-risk assets:

	Good credit rating	Poor credit rating	No internal rating	Total
At 31/03/2020	91%	8%	1%	100%
At 30/09/2020	92%	7%	1%	100%

The exposure to counterparty risk by nature of activity is distributed as follows:

	Purchases	Insurance	Distribution and sales	Cash and asset management	Fuel purchases and energy trading	Total
At 31/03/2020	6%	-	10%	77%	7%	100%
At 30/09/2020	6%	-	9%	79%	6%	100%

Exposure in the energy trading activities is concentrated in EDF Trading, where each counterparty is assigned a limit that depends on its financial robustness. A range of methods are used to reduce counterparty risk at EDF Trading, primarily position netting agreements, cash-collateral agreements and establishment of guarantees from banks or affiliates.

For counterparties dealing with EDF's trading room, the CRFI Department has drawn up a framework specifying counterparty authorisation procedures and the methodology for calculation of allocated limits. The level of exposure can be consulted in real time and is systematically monitored on a daily basis. The suitability of limits is reviewed without delay in the event of an alert or unfavourable development affecting a counterparty.

As the political and financial situation in the Euro zone is still uncertain, EDF has continued to apply a conservative management policy for its cash investments in non-core countries. Only banking, sovereign and corporate counterparties with good credit ratings are authorised, for limited amounts and maturities.

5.1.6.2 Management and control of energy market risks

5.1.6.2.1 Energy market risk policy

In keeping with the opening of the final customer market, the growth of wholesale markets and its international development, the EDF group is exposed to price variations on the energy market which can significantly affect its financial statements (see chapter 2.2.2-2C of the Universal Registration Document, "Energy market risks").

Consequently, the Group has an "energy market" risk policy for all energy commodities, applicable to EDF and entities over which it has operational control.

The purpose of this policy is to:

- define the general framework for management of energy market risks, governing the various Group entities' asset portfolio management activities (energy generation, optimisation and sale), and trading for EDF Trading;
- define the responsibilities of asset managers and traders, and the various levels of control of activities;
- implement a coordinated Group-wide hedging policy that is coherent with the Group's financial commitments;
- consolidate the exposure of the various entities operationally controlled by EDF on the structured energy-related markets.

The Group Risk Division presents an annual report on the implementation of this policy to the Board of Directors' Audit Committee.

At entities not operationally controlled by EDF, the risk management framework is reviewed by the governance bodies.

5.1.6.2.2 Organisation of risk control and general risk hedging principle

The process for controlling energy market risks for entities operationally controlled by the Group is based on:

- a governance and market risk exposure measurement system, clearly separating management and risk control responsibilities;
- an express delegation to each entity, defining hedging strategies and establishing the associated risk limits. This enables the Executive Committee to set out and monitor an annual Group risk profile consistent with the financial objectives, and thus direct operational management of energy market risks over market horizons (generally three years).

The basic principle for hedging is:

- netting of upstream/downstream positions; wherever possible, sales to final customers are hedged by Internal sales;
- gradual closing of most positions before the end of the budget year, based on a predefined hedging trajectory [(1)] that captures an average price, potentially with overweighting of year N-1 in view of liquidity constraints on the forward markets.

On the French electricity market, EDF is exposed to very high uncertainty over its net exposure due to the fact that the ARENH mechanism is optional and uncertainty regarding possible changes to the relevant regulations (the risk that the ceiling for volumes made available could be raised to 150TWh under the Energy and Climate law adopted in 2019, and more broadly, uncertainties over the outcome of the current discussions between the French government and the European Commission on changes to price regulations for nuclear power produced by the existing plants). Since the volumes subscribed are only known shortly before the delivery period, EDF is obliged to use assumptions for ARENH subscriptions, which include prudence margins. EDF thus remains subject to risks that the assumptions may not correspond to reality, such that during the year it could find itself obliged to sell reserved volumes that in the end were not actually subscribed, or conversely to purchase volumes sold before the ARENH bids took place on the assumption that there would be no subscriptions. This risk is particularly high when the energy + capacity price on the wholesale market is close to the ARENH price (€42/MWh).

Given its close interaction with the decisions made in the generation, supply and trading activities, the energy risk management process involves Group management and is based on a risk indicator and measurement system incorporating escalation procedures in the event risk limits are exceeded.

The Group's exposure to energy market risks through operationally controlled entities is reported four times a year to the Executive Committee. The control processes are regularly evaluated and audited.

5.1.6.2.3 Principles for operational management and control of energy market risks

The principles for operational management and control of energy market risks for the Group's operationally controlled entities are based on strict segregation of responsibilities for managing those risks, distinguishing between management of assets (generation and supply) and trading.

The operators of generation and supply assets are responsible for implementing a risk management strategy that smoothes the impact of energy market risks on the variability of their financial statements (the accounting classifications of the hedges used are described in note 18.7 to the 2020 consolidated financial statements, "Derivatives and Hedge accounting"). However, they are still exposed to structural price trends to the extent of volumes that are not yet hedged, and uncertainties over volumes (relating to the ARENH system, generation plant availability, and customer consumption).

For operationally controlled entities in the Group, positions on the energy markets are taken predominantly by EDF Trading, the Group's trading entity, which operates on the markets on behalf of other Group entities and for the purposes of its own trading activity associated with the Group's industrial assets. Consequently, EDF Trading is subject to a strict governance and control framework, particularly the European regulations on trading companies.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options (regardless of the accounting classification applied at Group level). Its exposure on the energy markets is strictly controlled through daily limit monitoring overseen by the subsidiary's management and by the division in charge of energy market risk control at Group level. Automatic escalation procedures also exist to inform members of EDF Trading's Board of Directors of any breach of risk limits (value at risk limit) or losses (stop-loss limits). Value at Risk (VaR) is a statistical measure of the potential maximum loss in market value on a portfolio in the event of unfavourable market movements, over a given time horizon and with a given confidence interval [(2)]. Specific Capital at Risk (CaR) limits are also used in certain areas (operations on illiquid markets, long-term contracts and structured contracts) where VaR is difficult to apply. The stop-loss limit stipulates the acceptable risk for the trading business, setting a maximum level of loss over a rolling three-month period. If these limits are exceeded, EDF Trading's Board of Directors takes appropriate action, which may include closing certain positions.

In 2020, EDF Trading's commitment on the markets was subject to a VaR limit of €35 million, a CaR limit for long-term contracts and a CaR limit for operations on illiquid markets of €250 million each, and a stop-loss limit of €180 million.

None of these limits was exceeded in 2020. The stop-loss has never been triggered since its introduction.

For an analysis of fair value hedges of the Group's commodities, see note 6 to the 2020 consolidated financial statements. For details of commodity derivatives, see note 18.7.4 to the same consolidated financial statements.

(1) The management framework, approved each year by the Group for each entity exposed to energy market risks, may include acceleration or deceleration schemes authorizing derogations from these defined trajectories in the event of breach of predefined price thresholds. Due to their derogatory nature from the general principle of gradual coverage, the implementation of such schemes is strictly supervised.

(2) EDF Trading evaluates VaR using a "Monte-Carlo" method which is based on volatility and historical correlations estimated from market prices observed over the last 40 working days. The VaR limit applies to EDF Trading's overall portfolio.

5.2 Subsequent events

There were no post balance sheet events other than those discussed in the other sections of the Universal Registration Document.

5.3 Changes in market prices at end February 2021

Spot (current for next day) electricity prices in France in January/February 2021 averaged at €54.5/MWh base load and €66.1/MWh peak load, rising strongly compared to January/February 2020 prices, which were €32.3/MWh base load and €39.5/MWh peak load. This increase can be explained by a simultaneous increase in consumption of 3.4TWh due to below-normal temperatures this year (-1.9°C in average over this period compared to 2020). Also to blame are higher coal and gas prices, CO_2 price, as well as lower wind power generation compared to January/February 2020. For the same reasons, German spot prices have rose strongly, not least due to an ever stronger decrease in solar and wind power generation (in Germany, -13.7TWh in total for the January/February period, compared to the same period last year). These prices averaged at €50.9/MWh base load and €61.7/MWh peak load, up by €22.2/MWh and €23.5/MWh respectively from January/February 2020.

At the end of February 2021, the prices of French yearly contracts for base load and peak load delivery in 2021 were €53.4/MWh and €66.8/MWh respectively. A year earlier, forward electricity prices for delivery in France in 2021 closed at a base load price of €42.0/MWh and a peak demand price of €52.7/MWh. This rise in prices is mainly due to the rise in gas, coal and CO_2 prices.

In January/February 2021, spot gas prices on the French market averaged at €19.1/MWh, up by €8.8/MWh compared to the same period in 2020. This increase reflects a particularly "strained" supply-demand balance in Europe. LNG arrivals in Europe are down, as cargoes have favoured the Asian market where prices were much more attractive. The recovery in Asian demand was indeed confirmed, supported by very low temperatures in January. European stocks, slightly above average levels at the beginning of January, continued to fall and were below normal levels for the season at the end of February. In France, consumption, which was up compared to the same period in 2020, was nevertheless slightly below average.

At the end of February 2021, the price of Brent was $66.1/bbl, up $15.6/bbl compared with the end of February 2020. From the beginning of 2020, the Covid pandemic began to weigh on Chinese and then global demand for oil, driving down the price per barrel. This downward effect of the pandemic on demand was confirmed throughout the year, with an direct impact on mobility (lock-downs, travel restrictions) as well as a dramatic impact on the economy (demand for trade and industry). To support prices in the face of this collapsed demand, OPEC+ worked to reduce supply, with the conclusion on 12 April of an agreement withdrawing up to 9.7mb/d of production. This agreement, reached in a context of tension after a price war between Saudi Arabia and Russia, was continued and renegotiated throughout the year in line with expectations of a recovery in demand. At the end of 2020 and in the beginning of 2021, the price moved upwards, erasing all the decline accumulated over the course of 2020, stimulated by the election of Joe Biden and the progress of vaccination campaigns.

The price of coal for delivery in Europe in 2022 ended February 2021 at $68.7/t, up by $11.7/t compared to the 2021 contract closed at the end of February 2020. The downwards trend of 2019 initially continued during the first half of 2020, driven by gloomy forward demand forecasts around the world, and very high stock levels across Europe. Coal demand, already weakened by competition from gas and the economic slowdown, has been hit hard by lock-down measures and their impact on growth. However, supply was also reduced, notably by social conflicts or cyclones, which kept prices between $55/t and $60/t throughout the third quarter of 2020. In the last quarter, the marked recovery in Asian demand, in particular China's imports from Russia and South Africa, led to a sharp rise in prices. The rise continued into early 2021, reinforced by cold temperatures in Asia.

The price of the CO_2 emission certificate for delivery in December 2021 closed the month of February 2021 at €37.3/t, up by €13.7/t compared to the closing price in February 2020 for delivery in December 2020. The price has fluctuated greatly during 2020, between the effects of the Covid pandemic and the negotiations on the European Union's climate goals for 2030, which are widely interpreted and followed by speculative players on this market. The price thus collapsed in March, losing €8.4/t in one week when the lock-down measures were spreading in Europe. From April onwards, the price reacted positively to announcements of economic stimulus measures and environmental policy signals, exceeding €30/t twice, in June and September. At the end of the year, announcements on vaccines and the vote to raise the EU's 2030 emission reduction targets to 55% continued to push up the allowance price. At the beginning of 2021, the progress of vaccination campaigns and the publication of analyses suggesting a possible sharp rise in prices by the end of the year continued to drive up the quota price, which even briefly exceeded €40/t in mid-February for the first time in its history.

5.4 Outlook

Subject to additional reinforced sanitary restrictions impacts.

2021 Targets [1]

- EBITDA [2]: > €17 billion;
- Net financial debt/EBITDA [2]: < 3x in 2021.

2022 Ambitions [3]

- Reduction in operating expenses [4]: €500 million between 2019 and 2022;
- Group disposals 2020-2022 [5]: ~ €3 billion;
- Net financial debt/EBITDA [2]: ~ 3x in 2022.

Dividend

- Target payout ratio of 2021 and 2022 net income excluding non-recurring items [6] : 45-50%

The French State committed to opt for a scrip dividend payment for 2021 fiscal year.

(1) Subject to additional reinforced sanitary restrictions impacts.
(2) On the basis of scope and exchange rates at 01/01/2021.
(3) Subject to additional reinforced sanitary restrictions impacts.
(4) Sum of personnel expenses and other external expenses. At constant scope, standards, exchange rates and pension discount rate; excluding inflation. Excluding the cost of sales of energy services and Framatome's nuclear engineering services and specific projects such as Jaitapur.
(5) Signed or completed disposals: impact on the Group's economic debt reduction.
(6) Payout ratio based on net income excluding non-recurring items, adjusted for the remuneration of hybrid bonds accounted for in equity.

Sustainable finance is core to the Group's financing strategy. EDF is a leading issuer in the Green Bonds market. In September 2020, the Group launched an issue of green convertible bonds (OCEANEs) for a nominal amount of €2.4 billion to finance its development in renewable energies, energy efficiency and projects contributing to the protection of biodiversity.

€6.9 billion	€12.5 billion	6.3 million	52%
OF GREEN BONDS ISSUED SINCE 2013	GREEN AND SUSTAINABLE FINANCING [1]	TONNES OF CO_2 AVOIDED PER YEAR THANKS TO THE PROJECTS FINANCED BY THE GREEN BONDS [2]	OF GROUP'S CREDIT FACILITIES INDEXED TO ESG CRITERIA

(1) Including credit facilities.

(2) Net estimated forecast data.

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6.1 Consolidated financial statements

The Group's consolidated financial statements for the year ended 31 December 2020, prepared under IAS-IFRS, are presented below. They will be submitted for approval at the General Shareholders' Meeting to be held on 6 May 2021.

Consolidated income statement

(in millions of euros)	*Notes*	2020	2019 [1]
Sales	*5.1*	69,031	71,347
Fuel and energy purchases	*5.2*	(32,425)	(35,091)
Other external expenses [2]		(8,461)	(8,625)
Personnel expenses	*5.3*	(13,957)	(13,797)
Taxes other than income taxes		(3,797)	(3,798)
Other operating income and expenses	*5.4*	5,783	6,687
Operating profit before depreciation and amortisation	***5***	**16,174**	**16,723**
Net changes in fair value on energy and commodity derivatives, excluding trading activities	*6*	(175)	642
Net depreciation and amortisation [3]		(10,838)	(10,020)
(Impairment)/reversals	*10.8*	(799)	(403)
Other income and expenses	*7*	(487)	(185)
Operating profit		**3,875**	**6,757**
Cost of gross financial indebtedness	*8.1*	(1,610)	(1,806)
Discount effect	*8.2*	(3,733)	(3,161)
Other financial income and expenses	*8.3*	2,761	4,603
Financial result	***8***	**(2,582)**	**(364)**
Income before taxes of consolidated companies		**1,293**	**6,393**
Income taxes	*9*	(945)	(1,532)
Share in net income of associates and joint ventures	*12*	425	818
Net income of discontinued operations	*3.2*	(158)	(497)
CONSOLIDATED NET INCOME		**615**	**5,182**
EDF net income		**650**	**5,155**
EDF net income – continuing operations		804	5,639
EDF net income – discontinued operations		(154)	(484)
Net income attributable to non-controlling interests		**(35)**	**27**
Net income attributable to non-controlling interests – continuing operations		(31)	40
Net income attributable to non-controlling interests – discontinued operations		(4)	(13)
Earnings per share (EDF share) in euros:	***14.7***		
Basic earnings per share		0.05	1.50
Diluted earnings per share		0.05	1.50
Basic earnings per share of continuing operations		0.10	1.67
Diluted earnings per share of continuing operations		0.10	1.67

(1) In application of IFRS 5, the net income of discontinued operations is presented on a separate line of the income statement for the financial periods presented. The impact of application of IFRS 5 on the published figures for 2019 is presented in note 1.4.2.
(2) Other external expenses are reported net of capitalised production costs.
(3) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

Consolidated statement of comprehensive income

(in millions of euros)	Notes	2020 EDF net income	2020 Net income attributable to non-controlling interests	2020 Total	2019 EDF net income	2019 Net income attributable to non-controlling interests	2019 Total
Consolidated net income		**650**	**(35)**	**615**	**5,155**	**27**	**5,182**
Fair value of cash flow hedges							
Fair value of cash flow hedges – gross change	*18.7.5*	(711)	(8)	(719)	786	(55)	731
Fair value of cash flow hedges – tax effects		210	3	213	(235)	2	(233)
Fair value of net investment hedges							
Fair value of net investment hedges – gross change	*18.7.5*	661	-	661	32	-	32
Fair value of net investment hedges – tax effects		(30)	-	(30)	(132)	-	(132)
Change in fair value of debt instruments							
Gross change in fair value of debt instruments	*18.1.2*	20	-	20	293	-	293
Related tax effect		10	-	10	(93)	-	(93)
Translation adjustments – controlled entities		**(1,425)**	**(430)**	**(1,855)**	**732**	**357**	**1,089**
Share in net income of associates and joint ventures – items that can be recycled to profit and loss		**(561)**	**-**	**(561)**	**97**	**-**	**97**
Gains and losses recorded in equity with recycling		***(1,826)***	***(435)***	***(2,261)***	***1,480***	***304***	***1,784***
Change in fair value of equity instruments							
Gross change in fair value of equity instruments	*18.1.2*	(34)	(4)	(38)	(22)	-	(22)
Related tax effect		-	-	-	-	-	-
Change in actuarial gains and losses on post-employment benefits							
Gross change in actuarial gains and losses on post-employment benefits	*16.1.3*	(983)	80	(903)	(2,501)	39	(2,462)
Related tax effect		(220)	(18)	(238)	(62)	(7)	(69)
Share in net income of associates and joint ventures – items that cannot be recycled to profit and loss		**(109)**	**-**	**(109)**	**(153)**	**-**	**(153)**
Gains and losses recorded in equity with no recycling		***(1,346)***	***58***	***(1,288)***	***(2,738)***	***32***	***(2,706)***
Total gains and losses recorded in equity		**(3,172)**	**(377)**	**(3,549)**	**(1,258)**	**336**	**(922)**
CONSOLIDATED COMPREHENSIVE INCOME		**(2,522)**	**(412)**	**(2,934)**	**3,897**	**363**	**4,260**
Comprehensive income of continuing operations		(2,368)	(408)	(2,776)	4,337	375	4,712
Comprehensive income of discontinued operations		(154)	(4)	(158)	(440)	(12)	(452)

Consolidated balance sheet

Assets

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Goodwill	*10.1*	10,265	10,623
Other intangible assets	*10.2*	9,583	9,350
Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets	*10.3*	92,600	89,099
Property, plant and equipment operated under French public electricity distribution concessions	*11*	60,352	58,413
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	*10.5*	6,858	6,860
Investments in associates and joint ventures	*12*	6,794	6,414
Non-current financial assets	*18.1*	47,615	46,219
Other non-current receivables	*13.3.4*	2,015	1,930
Deferred tax assets	*9.3*	1,150	557
Non-current assets		**237,232**	**229,465**
Inventories	*13.2*	14,738	14,049
Trade receivables	*13.3*	14,521	15,606
Current financial assets	*18.1*	23,532	29,401
Current tax assets		384	286
Other current receivables	*13.3.4*	6,918	6,881
Cash and cash equivalents	*18.2*	6,270	3,934
Current assets		**66,363**	**70,157**
Assets classified as held for sale	*3.2*	2,296	3,662
TOTAL ASSETS		**305,891**	**303,284**

Equity and liabilities

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Capital	*14*	1,550	1,552
EDF net income and consolidated reserves		44,083	44,914
Equity (EDF share)		***45,633***	***46,466***
Equity (non-controlling interests)	*14.6*	9,593	9,324
Total equity	***14***	**55,226**	**55,790**
Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores	*15*	58,333	55,583
Provisions for employee benefits	*16*	22,130	20,539
Other provisions	*17*	5,374	4,638
Non-current provisions		***85,837***	***80,760***
Special French public electricity distribution concession liabilities	*11.2*	48,420	47,465
Non-current financial liabilities	*18.3*	55,899	57,002
Other non-current liabilities	*13.5*	4,874	4,928
Deferred tax liabilities	*9.3*	3,115	2,295
Non-current liabilities		**198,145**	**192,450**
Current provisions	*15, 17 and 16.1*	5,827	5,556
Trade payables	*13.4*	11,900	12,867
Current financial liabilities	*18.3*	17,609	18,535
Current tax liabilities		215	433
Other current liabilities	*13.5*	16,861	16,610
Current liabilities		**52,412**	**54,001**
Liabilities related to assets classified as held for sale	*3.2*	108	1,043
TOTAL EQUITY AND LIABILITIES		**305,891**	**303,284**

Consolidated cash flow statement

(in millions of euros)	*Notes*	2020	2019 [1]
Operating activities:			
Consolidated net income		**615**	**5,182**
Net income of discontinued operations		**(158)**	**(497)**
Net income of continuing operations		**773**	**5,679**
Impairment/(reversals)		799	403
Accumulated depreciation and amortisation, provisions and changes in fair value		13,310	8,358
Financial income and expenses		785	101
Dividends received from associates and joint ventures		433	349
Capital gains/losses		(185)	(508)
Income taxes		945	1,532
Share in net income of associates and joint ventures		(425)	(818)
Change in working capital	*13.1.2*	(1,679)	475
Net cash flow from operations		***14,756***	***15,571***
Net financial expenses disbursed		(1,008)	(802)
Income taxes paid		(983)	(915)
Net cash flow from continuing operating activities		**12,765**	**13,854**
Net cash flow from operating activities relating to discontinued operations		**98**	**168**
Net cash flow from operating activities		**12,863**	**14,022**
Investing activities:			
Acquisitions of equity investments, net of cash acquired		(126)	(456)
Disposals of equity investments, net of cash transferred		498	293
Investments in intangible assets and property, plant and equipment	*10.7*	(16,007)	(16,797)
Net proceeds from sale of intangible assets and property, plant and equipment		54	94
Changes in financial assets		2,797	1,294
Net cash flow from continuing investing activities		**(12,784)**	**(15,572)**
Net cash flow from investing activities relating to discontinued operations		**(104)**	**(78)**
Net cash flow from investing activities		**(12,888)**	**(15,650)**
Financing activities:			
Transactions with non-controlling interests [2]		1,019	1,055
Dividends paid by parent company	*14.3*	-	(58)
Dividends paid to non-controlling interests		(267)	(155)
Purchases/sales of treasury shares		5	(14)
Cash flows with shareholders		***757***	***828***
Issuance of borrowings	*18.3.2.1*	6,601	9,080
Repayment of borrowings	*18.3.2.1*	(7,062)	(6,976)
Issuance of perpetual subordinated bonds and OCEANEs	*14.4 and 14.5*	2,243	493
Redemptions of perpetual subordinated bonds		-	(1,280)
Payments to bearers of perpetual subordinated bonds	*14.4*	(501)	(589)
Funding contributions received for assets operated under concessions and investment subsidies		534	686
Other cash flows from financing activities		***1,815***	***1,414***
Net cash flow from continuing financing activities		**2,572**	**2,242**
Net cash flow from financing activities relating to discontinued operations		**19**	**(19)**
Net cash flow from financing activities		**2,591**	**2,223**
Net cash flow from continuing operations		2,553	524
Net cash flow from discontinued operations		13	71
Net increase/(decrease) in cash and cash equivalents		**2,566**	**595**
CASH AND CASH EQUIVALENTS – OPENING BALANCE		**3,934**	**3,290**
Net increase/(decrease) in cash and cash equivalents		2,566	595
Currency fluctuations		(162)	(5)
Financial income on cash and cash equivalents		35	17
Other non-monetary changes		(103)	37
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	***18.2***	**6,270**	**3,934**

(1) The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).

(2) Contributions via capital increases, or capital reductions and acquisitions of additional interests or disposals of interests in controlled companies. In 2020, this item includes an amount of €998 million relating to CGN's payment for the capital increases by NNB Holding Ltd. (for the Hinkley point C project) and Sizewell C Holding Co.. In 2019, this item includes an amount of €967 million relating to CGN's payment for the capital increases by NNB Holding Ltd. (for the Hinkley Point C project) and Sizewell C Holding Co..

Change in consolidated equity

Details of the change in equity between 1 January and 31 December 2020 are as follows:

(in millions of euros)	Capital	Treasury shares	Translation adjustments [1]	Fair value adjustment of financial instruments (OCI with recycling) [2]	Other consolidated reserves and net income [3]	Equity (EDF share)	Equity (non-controlling interests)	Total equity
EQUITY RESTATED UNDER IFRIC 23 AT 01/01/2019	**1,505**	**(56)**	**215**	**(1,856)**	**44,651**	**44,459**	**8,177**	**52,636**
Gains and losses recorded in equity	-	-	822	658	(2,738)	(1,258)	336	(922)
Net income	-	-	-	-	5,155	5,155	27	5,182
Consolidated comprehensive income	**-**	**-**	**822**	**658**	**2,417**	**3,897**	**363**	**4,260**
Payments on perpetual subordinated bonds	-	-	-	-	(589)	(589)	-	(589)
Issuance/Redemption of perpetual subordinated bonds	-	-	-	-	(1,125)	(1,125)	-	(1,125)
Dividends paid	-	-	-	-	(941)	(941)	(155)	(1,096)
Purchases/sales of treasury shares	-	(8)	-	-	-	(8)	-	(8)
Capital increase by EDF (see note 14.1)	47	-	-	-	834	881	-	881
Other changes [4]	-	-	-	-	(108)	(108)	939	831
EQUITY AS PUBLISHED AT 31/12/2019	**1,552**	**(64)**	**1,037**	**(1,198)**	**45,139**	**46,466**	**9,324**	**55,790**
Gains and losses recorded in equity	-	-	(1,908)	82	(1,346)	(3,172)	(377)	(3,549)
Net income	-	-	-	-	650	650	(35)	615
Consolidated comprehensive income	**-**	**-**	**(1,908)**	**82**	**(696)**	**(2,522)**	**(412)**	**(2,934)**
Payments on perpetual subordinated bonds	-	-	-	-	(501)	(501)	-	(501)
Issuance/Redemption of perpetual subordinated bonds and OCEANEs (see notes 14.4 and 15)	-	-	-	-	2,207	2,207	-	2,207
Dividends paid	-	-	-	-	-	-	(271)	(271)
Purchases/sales of treasury shares	-	1	-	-	-	1	-	1
Capital decrease by EDF (see note 14.1)	(2)	53	-	-	(51)	-	-	-
Other changes [5]	-	-	-	-	(18)	(18)	952	934
EQUITY AT 31/12/2020	**1,550**	**(10)**	**(871)**	**(1,116)**	**46,080**	**45,633**	**9,593**	**55,226**

(1) Changes in translation adjustments amount to €(1,908) million at 31 December 2020. This variation is due to the depreciation of the pound sterling and the dollar against the euro.

(2) Changes in reserves recorded in OCI (Other Comprehensive Income) with recycling are shown in the Statement of Comprehensive Income. They correspond to the effects of fair value adjustments of debt securities and financial instruments hedging cash flows and net foreign investments, and amounts recycled to profit and loss in respect of terminated contracts and debt instruments transferred.

(3) Fair value changes recorded in OCI with no recycling are presented in this column.

(4) In 2019, "Other changes" in equity (non-controlling interests) include the effect of capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co. amounting to €967 million.

(5) In 2020, "Other changes" in equity (non-controlling interests) include the effect of capital increases funded by CGN for NNB Holding Ltd. and Sizewell C Holding Co. amounting to €998 million.

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Notes to the consolidated financial statements

Électricité de France (EDF or the "Company") is a French *société anonyme* governed by French law, and registered in France (22-30, avenue de Wagram, 75008 Paris).

The consolidated financial statements reflect the accounting position of the Company and its subsidiaries (which together form the "Group") and the Group's interests in associates, joint arrangements classified as joint operations, and joint ventures, for the year ended 31 December 2020.

The Group is an integrated energy operator engaged in all aspects of the energy business: power generation (nuclear power, hydropower, wind and solar power, thermal energy, etc.), transmission, distribution, supply, trading, energy services, production of equipment and fuel assemblies, and reactor services.

The Group's consolidated financial statements at 31 December 2020 were prepared under the responsibility of the Board of Directors and approved by the directors at the Board meeting held on 17 February 2021. They will become final after approval at the General Shareholders' Meeting to be held on 6 May 2021.

Note 1 Group accounting policies

1.1 Declaration of conformity and Group accounting policies

Pursuant to European regulation 1606/2002 of 19 July 2002 on the adoption of international accounting standards, the EDF group's consolidated financial statements at 31 December 2020 are prepared under the presentation, recognition and measurement rules set out in the international accounting standards published by the IASB and approved by the European Union for application at 31 December 2020. These international standards are IAS (International Accounting Standards), IFRS (International Financial Reporting Standards), and SIC and IFRIC interpretations.

The Group has not opted for early application of standards and interpretations that were not yet mandatory in 2020.

1.2 Changes in accounting standards

The parent company's functional currency is the Euro. The Group's financial statements are presented in millions of euros.

The accounting and valuation methods applied by the Group in the consolidated financial statements at 31 December 2020 are identical to those used in the consolidated financial statements at 31 December 2019, with the exception of the changes presented below in notes 1.2.1, 1.2.2 and 1.2.3. Information is also given on the standards, amendments and interpretations adopted by the European Union that are applicable from 1 January 2021 (note 1.2.4), and released by the IASB but not yet adopted by the European Union (note 1.2.5).

For purposes of clarity, the accounting principles and methods used are now described in individual notes to the financial statements.

1.2.1 Business Combinations – Amendments to IFRS 3: Definition of business

These amendments, adopted by European Union on 21 April 2020, applicable to business combinations taking place from 1 January 2020, aim to clarify the distinction between the purchase of a business and the purchase of a group of assets. They allow the use of a concentration test to determine if an entity has acquired a single identifiable asset or group of similar identifiable assets rather than a business (or operation), based on whether substantially all of the fair value of the gross assets acquired is concentrated in a single asset (or a group of similar assets). The Group applies this test to certain acquisitions, with no impact on its financial statements at 31 December 2020.

1.2.2 Interest Rate Benchmark Reform – Amendments to IFRS 9, IAS 39 and IFRS 7 (phase 1)

The current benchmark interest rates (IBOR - Interbank Offered Rates) will be replaced by new alternative benchmarks (Risk Free Rates), some of which will take effect in 2021. This reform is particularly likely to affect certain commercial contracts (*e.g.* late payment penalties on supplier or customer contracts) and financial instruments (loans and receivables, borrowings, valuation of leases, derivatives). The principal rates concerned by the reform that are used by the Group are Euribor, Libor USD and Libor GBP.

The IASB has published several amendments to IFRS 9, IAS 39 and IFRS 7 that limit the impacts of the interest rate benchmark reform for issuers. The amendments to IFRS 9, IAS 39 and IFRS 7 for phase 1 of the reform, adopted on 15 January 2020 by European Union and applicable since 1 January 2020, allow continuation of hedge accounting until the transition to the new interest rates is effective, and entail no impact on the Group's 2020 financial statements.

1.2.3 Covid-19-Related Rent Concessions – Amendments to IFRS 16

These amendments concern the treatment by the lessee of relief granted by the lessor on a current lease as a direct result of the Covid-19 pandemic, in the form of "payment holidays" or temporary rent reductions (for payments up to 30 June 2021 at the latest). Provided there is no substantial modification of the terms of the lease, the lessee is allowed by these amendments not to re-estimate the lease liability using a revised discount rate, with a corresponding adjustment to the right-of-use asset, and not to defer the value of the relief through amortisation of the right-of-use asset. The lessee can therefore opt to record the impact directly in profit and loss.

Application from 1 June 2020 of these amendments, which were adopted by the European Union on 9 October 2020, has no material impact on the Group's financial statements.

1.2.4 Standards adopted by the European Union and applicable for financial years beginning on or after 1 January 2021

Interest rate benchmark reform – Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 (Phase 2)

The amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 for phase 2 of this reform were adopted on 13 January 2021 and are applicable for financial years beginning on or after 1 January 2021 (with retrospective application).

They state that in the event of modification of contractual terms as a direct consequence of the interest rate benchmark reform, and in application of paragraph B5.4.5 of IFRS 9, there is no immediate impact on profit and loss for the year.

A working team has been set up to identify all instruments for each reference interest rate that could be affected by this reform, organise the contractual, organisational and IT aspects of the transition, and introduce appropriate accounting treatments. At the year-end the Group has not identified any events requiring early application, even partial, of the phase 2 amendments.

1.2.5 Standards, amendments and interpretations published by the IASB but not yet adopted by the European Union

Property, Plant and Equipment - Proceeds before Intended Use - Amendments to IAS 16

These amendments modify the treatment of proceeds from selling items produced by an asset before it is ready for its intended use, by prohibiting deduction of those proceeds from the cost of the asset. Such proceeds and the associated costs must instead be recognised in profit and loss.

Subject to adoption by the European Union, these amendments are expected to be applicable from 1 January 2022 and would concern the Group's projects for construction of energy generation assets (particularly Flamanville 3).

Onerous Contracts – Cost of Fulfilling a Contract – Amendments to IAS 37

These amendments clarify the nature of the costs to be included in the cost of fulfilling a contract when assessing whether a contract is onerous. They mainly concern incremental costs such as direct labour and materials, and other costs relating directly to the contract, such as allocation of the depreciation charge for a tangible asset that is used in fulfilling the contract.

The Group does not currently anticipate any material impact to result from these amendments, which are expected to be applicable from 1 January 2022.

Other standards, amendments and interpretations

The Group does not currently anticipate any material impact to result from changes introduced by the "Annual improvements – 2018-2020 cycle" which are expected to be applicable from 1 January 2022.

1.3 Basis for preparation of the financial statements

1.3.1 Valuation

The consolidated financial statements are prepared on a historical cost basis, with the exception of assets acquired and liabilities assumed through business combinations, and of certain financial instruments, which are stated at fair value.

1.3.2 Translation methods

1.3.2.1 Functional currency

An entity's functional currency is the currency of the economic environment in which it primarily operates. In most cases, the local currency is the functional currency. But for some entities, a functional currency other than the local currency may be used when it reflects the currency used in the principal transactions.

1.3.2.2 Translation of the financial statements of foreign companies whose functional currency is not the Euro

The financial statements of foreign companies whose functional currency is not the Euro are translated as follows:

- balance sheets are translated into Euros at the closing rate;
- income statements and cash flows are translated at the average rate for the period;
- resulting differences are recognised in equity under the heading "Translation adjustments".

Translation adjustments affecting a monetary item that is an integral part of the Group's net investment in a consolidated foreign company are included in consolidated equity until the disposal or liquidation of the net investment, at which date they are recognised as income or expenses in the income statement, in the same way as other exchange differences concerning the Company.

1.3.2.3 Translation of transactions in foreign currencies

In application of IAS 21, transactions expressed in foreign currencies are initially translated and recorded in the functional currency of the entity concerned, using the rate in force at the transaction date.

At each reporting date, monetary assets and liabilities expressed in foreign currencies are translated at the closing rate. The resulting foreign exchange differences are taken to the income statement.

In application of IFRIC 22, any payment or receipt of a non-monetary advance in a foreign currency must be translated at the exchange rate of the transaction date, with no subsequent adjustment.

1.3.3 Financial statement presentation rules

Assets and liabilities contributing to working capital used in the entity's normal operating cycle are classified as current in the consolidated balance sheet. Other assets and liabilities are classified as current if they mature within one year of the closing date, and non-current if they mature more than one year after the closing date.

The income statement presents items by nature. The heading "Other income and expenses" presented below the operating profit before depreciation and amortisation comprises items of an unusual nature or amount.

1.3.4 Management judgements and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in the Group's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

In a context characterised by volatility on the financial and energy markets, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of Group assets.

The principal operations for which the Group uses estimates and judgments are the following:

1.3.4.1 Depreciation period of nuclear power plants in France

In the specific case of the depreciation period of its French nuclear power plants, the EDF group's industrial strategy is to continue operation beyond 40 years, in optimum conditions as regards safety and efficiency.

The depreciation period of 900MW series power plants was extended from 40 years to 50 years in 2016 (except for Fessenheim where both reactors were permanently shut down in the first half of 2020) since all the technical, economic and governance conditions were fulfilled. The depreciation period of other series (1300MW and 1450MW), which are more recent, is currently unchanged at 40 years.

These depreciation periods take into account the date of recoupling with the network after the most recent 10-year inspection.

The Tricastin plant's reactor 1 was reconnected to the grid on 23 December 2019 after the fourth 10-year inspection. This was the first 900MW series unit to pass the 40-year mark.

The fourth 10-year inspections of units 2 and 4 at Bugey began in 2020 (respectively early and late in the year), and the number of ten-year inspections to be conducted simultaneously in 2021 has increased to 5.

The ASN's decision setting the technical prescriptions applicable to 900MW series reactors, in view of the conclusions of the "generic" phase of the fourth periodic review, is expected to be issued by the end of February 2021.

Following the final adoption of France's multi-year energy programme (PPE) in April 2020 (see note 2), the Group's financial statements at 31 December 2020 include the impact of the two early reactor shutdowns to take place in 2027 and 2028 before they reach fifty years of operation. Depreciation plans have been accelerated from 1 July 2020, based on the various possible shutdown scenarios, as the decision regarding which reactors should be shut down does not have to be made yet. Nuclear provisions were re-estimated accordingly at 30 June 2020 (see note 15.1.1.3).

1.3.4.2 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning technical processes, costs, inflation rates, long-term discount rates, the depreciation period of plants currently in operation and disbursement schedules.

These parameters are therefore re-estimated at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by the Group.

The Group considers that the assumptions used at 31 December 2020 are appropriate and justified. However, any future change in assumptions could have a significant impact on the Group's balance sheet and income statement (see note 15).

For France, the main assumptions and sensitivity analyses relating to EDF's nuclear provisions are presented in note 15.1.1.5.

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as:

- changes in the regulations, particularly on safety, security and environmental protection, and financing of long-term nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (Agence nationale pour la gestion des déchets radioactifs);
- changes in the contractual terms for spent fuel management;
- changes in certain financial parameters such as discount rates or inflation rates;
- the depreciation period of nuclear facilities (calculation of decommissioning provisions for nuclear plants in operation is based on the depreciation period of the assets concerned, *i.e.* 50 years for 900MW series power plants and 40 years for 1300MW series and N4 series power plants).

1.3.4.3 Pensions and other long-term and post-employment benefit obligations

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates, inflation rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2020 are presented in note 16. These assumptions are updated annually. The Group considers the actuarial assumptions used at 31 December 2020 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and the Group's equity and net income. Sensitivity analyses are therefore presented in note 16.

1.3.4.4 Impairment of goodwill and long-term assets

Impairment tests on goodwill and long-term assets are sensitive to the macro-economic and segment assumptions used – particularly concerning energy price movements – and medium-term financial forecasts. The Group therefore revises the underlying estimates and assumptions based on regularly updated information.

These assumptions, which are specific to Group companies, are presented in note 10.8.

1.3.4.5 Financial instruments

In measuring the fair value of unlisted financial instruments (essentially energy contracts), the Group uses valuation models based on a certain number of assumptions subject to unforeseeable developments.

1.3.4.6 Energy supplied but not yet measured and billed

As explained in note 5.1, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistic models and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

1.3.4.7 Obligations concerning French public distribution concession assets to be replaced

In view of the specific nature of French public electricity distribution concessions, the Group has opted to present its obligation to replace concession assets in the balance sheet at a value based on the amount of contractual commitments as calculated and disclosed to the concession-granting authorities in the annual business reports (see note 11). Measurement of the concession liability concerning assets to be replaced is notably subject to unforeseeable developments in terms of costs, the useful life of assets and disbursement dates.

1.3.4.8 Deferred tax assets

The use of estimates and assumptions over recovery horizons is particularly important in the recognition of deferred tax assets.

1.3.4.9 Other judgements

- For the application of IFRS 10 and IFRS 11, the Group uses judgment to assess control or classify the type of partnership arrangement represented by a jointly-controlled entity.
  In particular, EDF has set up "reserved" investment funds for some of its funds set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste (see note 15.1.2.4). In view of the funds' characteristics, the prerogatives exercised by their managers and the procedures for defining the management strategies applicable to them, the Group considers that it does not have control, as defined by IFRS 10, over these funds. They are consequently treated as debt securities, in application of IFRS 9.
  Furthermore, through its subsidiary Edison, since 2014 the Group has held a 30% investment in E2i Energie Speciali (formerly Edens), with F2i. However, the governance arrangements and contractual agreements introduced for E2i Energie Speciali in connection with this transaction give Edison exclusive control over the Company. In application of IFRS 10, E2i Energie Speciali is therefore fully consolidated (*via* Edison) in the Group's consolidated financial statements. On 14 January 2021 Edison announced the signature of one agreement with F2i for the Group's purchase of a 70% interest in E2i Energie Speciali which is currently held by F2i. The acquisition was finalised on 16 February 2021. As E2i Energie Speciali is already fully consolidated by the Group, the acquisition of an additional 70% interest has an impact on non-controlling interests, and therefore on equity (see note 3.2) and ultimately on EDF net income.
- When there is no standard or interpretation applicable to a specific transaction, the Group exercises judgment to define and apply accounting methods that supply relevant and reliable information for preparation of its financial statements.

1.3.5 Nature and extent of restrictions on the Group's ability to access and use assets or settle liabilities

The main restrictions that may limit the Group's ability to access or use its assets or settle its liabilities concern the following items:

- assets held to fund employee benefits (principally in France and the United Kingdom – see note 16) and expenses related to nuclear liabilities (principally in France – see note 15.1.2 – and the United Kingdom – see note 15.2);
- tangible and intangible assets and the related liabilities associated with concession agreements, whether or not they are subject to regulatory mechanisms (obligations to supply energy or energy-related services, rules governing investments, an obligation to return concession facilities at the end of the contract, amounts payable at the end of the contract, tariff constraints, etc.). These restrictions mainly apply to assets of this type in France (EDF, Enedis, Électricité de Strasbourg and Dalkia), and to a lesser extent Italy (see notes 10.5);
- the sale of Group investments in certain subsidiaries may require authorisations from State bodies, particularly when they exercise a regulated activity or operate nuclear power plants (this is the case for EDF Nuclear Generation Ltd. in the United Kingdom, Taishan (TNPJVC) in China and CENG in the United States);
- prudential reserves established and measures taken as regards distribution capacity, so that the insurance subsidiaries will meet their prudential ratio requirements;
- the cash of certain entities that use financing arrangements stipulating that dividend distribution is subject to conditions concerning repayment of bank debt (or qualification for loans) and shareholders, or are subject to regulatory limitations in certain countries.

Certain shareholder agreements concerning companies controlled by the Group include clauses to protect minority shareholders, requiring approval from minority shareholders for certain particularly important decisions.

Finally, certain financing loans granted to Group entities contain early repayment clauses (see note 18.3.4), and certain items of cash and cash equivalents are subject to restrictions (see note 18.2).

1.4 Comparability (including the effect of the Covid-19 pandemic)

1.4.1 Consequences of the Covid-19 pandemic

The economic disruption caused by the Covid-19 pandemic had significant repercussions for many of the Group's activities in 2020, particularly nuclear power, worksites, supply and services.

On 14 April 2020 [1], the Group withdrew all its financial targets for 2020, including the lower threshold (€17.5 billion) for operating profit before depreciation and amortisation, and also for 2021. The Group was able to publish a new 2020 target for operating profit before depreciation and amortisation on 31 July 2020, setting a range of €15.2-15.7 billion. This was confirmed on 13 November 2020 when the third-quarter results were published, then revised upwards on 16 December 2020 to €16 billion or slightly more, given the greater clarity in the second half of the year regarding nuclear power generation in France in the crisis context.

Nuclear power generation in France

As announced in the press release of 16 April 2020 [2], due to the Covid-19 crisis EDF had to make adjustments to all its activities in order to protect personnel working at its nuclear power plants. Work on the industrial maintenance programme, particularly scheduled operations during maintenance outages, was significantly affected, with a resulting reduction in the electricity generation capacity. EDF thus had to adjust its schedule of reactor outages for maintenance so as to contribute alongside the transmission operator RTE to ensuring a secure power supply throughout the winter of 2020-2021. Some reactors were consequently taken offline in order to save their fuel.

In addition, the economic slowdown during France's lockdown led to a decline of up to 20% in electricity consumption compared to normal levels [3], resulting in lower use of power plants.

Due to measures taken as a result of the Covid-19 pandemic (social distancing, organisation of employee movements, limits on the number of workers on site), work took longer to complete. Consequently, nuclear reactor outages lasted longer under the twin constraints of lower employee availability and lower productivity. The industrial maintenance programme was therefore revised to adjust scheduled work to industrial capacities, and match the number of reactors in operation to requirements of the network, particularly for the winter period of 2020-2021.

This crisis also led EDF to amend the schedule for reactor outages in future years. Reactor outages depend on complex optimisation in a field subject to many constraints, such as fuel management, compliance with regulatory requirements and scheduling work to match industrial capacities, while always ensuring a balance between supply and demand for electricity, especially in the winter period. As reactor outages are scheduled several years in advance by reference to forecast network requirements and industrial resources, deferring outages from one year to the next has a knock-on effect on the maintenance programme in subsequent years and therefore on the expected power output.

EDF's press release of 16 April 2020 consequently stated a revised estimate of annual nuclear power output in France: approximately 300TWh in 2020 (compared to between 375TWh and 390TWh as communicated on 14 February 2020), reflecting the consequences of the Covid-19 pandemic and other factors affecting availability of the nuclear fleet, and between 330TWh and 360TWh each year in 2021 and 2022.

On 2 July 2020 [4] the EDF group then announced an upward revision to this estimate of annual nuclear power output in France in 2020, to approximately 315-325TWh.

These revisions were undertaken because work resumed earlier than had been expected when the 16 April estimate was published. The duration of scheduled outages in 2020 was adjusted in view of the observed on-site conditions for the return to work. EDF was able to complete several outages of the 2020 programme during the first half of the year, and continue work on reactors still in operation, while respecting the required measures to prevent the spread of the virus, by optimising movements into and out of restricted-access areas through adjustments to the organisation of work so as to limit the number of people working on the same activity, or using work-from-home arrangements. As a result of the Covid-19 pandemic, the second half of the year began with more reactors on scheduled outages for maintenance than initially planned.

Thanks to better performances than expected on maintenance outages during the second half of the 2020, it was possible to re-estimate nuclear power output for the year at 325-335TWh on 13 November, then announce that it would be close to 335TWh on 16 December 2020. In the end nuclear output for 2020 stood at 335.4TWh, 44.1TWh lower than in 2019 due to the direct and indirect effects of the Covid-19 pandemic totalling 32.9TWh (modulation in response to demand and the timing of outages; constraints associated with measures to prevent the spread of the virus, affecting work during outages). As well the impacts of the pandemic, the decrease in nuclear power output compared to 2019 is mainly attributable to the shutdown of the two Fessenheim reactors, and prolongation of three complex outages.

Support for customers and suppliers

As set out in the press release of 16 April 2020 [5], EDF introduced specific measures to support its customers in the context of the Covid-19 pandemic.

During France's first official public health emergency period, from 24 March to 10 July, EDF decided to guarantee the power supply for all residential customers by suspending all reductions and cut-offs of electricity and gas supplies, and all late payment penalties, until 1 September 2020, and to support customers in difficulty by offering more flexible payment terms and deadlines. The Company thus took steps that went further in both scope and duration than the measures introduced by the French government (such as extending the period when tenant evictions and customer power cut-offs are banned, which normally covers the winter months, to 10 July 2020).

For business customers, EDF took all the necessary measures to grant payment deferrals requested by customers eligible for the national Solidarity Fund, in compliance with the ordinances and decrees adopted by the government. The small businesses concerned were entitled to request deferred payment of invoices falling due until the end of France's first public health emergency period (10 July 2020). The deferred amounts were spread over a 6-month period from the last day of the month following that date.

The French government then declared a public health emergency period from 17 October 2020, initially until February 2021 but which could be extended to 1 June 2021. For residential customers, EDF took further measures in addition to the standard winter ban on evictions and power cut-offs that begins in France on 1 November: to protect customers in difficulty, EDF decided to suspend all power reductions until 15 January 2021, not to apply late payment penalties to invoices issued during the period, and to allow customers extended payment deadlines. The higher risk of non-recovery associated with these measures is incorporated into calculation of the provisions for customer receivables at 31 December 2020 (see note 13.3). For business customers, EDF was prepared to allow deferred payment on invoices as required by the French law of October 2020 on the Covid-19 emergency as soon as its application decree defining the scope of customers concerned was published. As that decree has not yet been published, debt collection on the business customer segment remained in line with normal laws and no specific measure has been applied by EDF.

In addition, as explained in the press release of 2 April 2020 [6], to support its very small, small and medium-sized suppliers in the economic slowdown caused by the pandemic, the Group decided to settle its suppliers' invoices sooner than the contractual 60-day period in France. This initially applied to completed services that had been validated by EDF at 31 March 2020: EDF SA paid its very small suppliers by mid-April and its small and medium-sized suppliers by the end of April, with no intervention required of the supplier. Enedis also took equivalent measures. The first wave of faster payments concerned more than twenty thousand invoices amounting to a total of around €190 million for the entire Group in France.

(1) See the press release of 14 April 2020: Update on the consequences of the Covid-19 sanitary crisis.
(2) See the press release of 16 April 2020: EDF revises its annual nuclear output forecast.
(3) See rte-france.fr – L'impact de la crise sanitaire (Covid-19) sur le fonctionnement du système électrique (5 April 2020, in French only).
(4) See the press release of 2 July 2020: EDF revises upwards its annual nuclear output estimate for 2020.
(5) See the press release of 16 April 2020: Crise sanitaire: EDF s'engage sur des mesures inédites pour aider tous ses clients (in French only).
(6) See the press release of 2 April 2020: The EDF group united in its determination to tackle the public-health crisis.

The practice was then progressively extended until the end of the first half-year, in line with the first emergency period which ended on 10 July 2020. In the period from April to June 2020, the Group thus settled nearly €500 million of invoices before the contractual deadline for very small, small and medium-sized suppliers in France. These measures taken in the first half-year have no impact on the Group's working capital at 31 December 2020.

Estimated impacts of the Covid-19 pandemic on the income statement for 2020

In accordance with AMF and ANC recommendations, the Group has not applied any different classifications as a result of Covid-19 from those normally used in its income statement. In-depth analyses were conducted in the Group's local entities and centrally for the half-year closing at 30 June 2020, then the annual closing at 31 December 2020, to prepare reliable estimates of the impacts of the pandemic on the Group's financial statements. The main estimated impacts of the Covid-19 pandemic on items of the Group's income statement are presented below.

The pandemic's impact on **sales** at 31 December 2020 is an estimated €(2,306) million (or around -3.3% of total sales). This impact mainly concerns the following business segments:

- France - Generation and Supply: the estimated impact of €(1,083) million, reflecting the lower nuclear power output and a decline in demand for electricity which led to sales on the wholesale markets at lower prices;
- France – Regulated activities: the estimated impact of €(278) million is mainly associated with the lower demand for electricity (leading to a decrease in sales of delivery services) and in the first half-year the downturn in network connection activity (work on connections and plant modification was suspended from 16 March until 11 May 2020);
- the United Kingdom: the estimated impact of €(451) million results from the lower demand for electricity, principally for customers in the industrial and business segments;
- Italy: the estimated impact of €(90) million reflects the downturn in demand for electricity and gas;
- Dalkia: the estimated impact of €(193) million principally relates to closures of client sites during the lockdown period (this had a significant effect on thermal and electric engineering work), and a lower level of business in services and to a smaller degree energy.

The impact of the Covid-19 pandemic on **fuel and energy purchases** at 31 December 2020, due to the decline it caused in nuclear power output and demand for electricity and gas, is an estimated decrease of approximately €854 million, principally in the France – Regulated activities and France – Generation and Supply segments and the United Kingdom.

The pandemic also had an estimated downward impact of €344 million **on external expenses (net of capitalised production costs)** reflecting several types of effect:

- lower purchases as a result of the business downturn in services and engineering work, principally at Dalkia;
- slowdowns or deferrals of on-site work in the Group's various businesses led to lower non-capitalisable purchases;
- additional expenses incurred in connection with the Covid-19 pandemic (protective equipment, hand sanitiser, etc.);
- lower purchases as a result of the lockdown and various measures introduced by the public authorities, for example restrictions on movement and requiring people to work from home (less travel, training and seminars, etc.).

Personnel expenses increased by some €64 million, principally in connection with the business recovery plan introduced by the Group. This amount includes indemnities received or receivable under furlough schemes in some Group entities in France (see note 1.4.1.5), amounting to approximately €18 million, together with the unfavourable effects of the pandemic in terms of employee holiday pay at certain Group entities in France.

Finally, **other operating income and expenses** were adversely affected to the extent of some €(309) million, including €(204) million following revaluation of impairment of trade receivables in various Group entities (see note 1.4.1.2) and €(45) million due to an increase in decommissioning provisions for permanently shut-down nuclear power plants in France where decommissioning work had to be postponed.

The above estimated impacts were prepared from specific reporting set up by the Management with all Group entities as part of the closing for the consolidated financial statements, applying the following approaches:

- effects associated with downturns in business levels (services, engineering work) or deferrals of work are based on detailed comparative analyses with the corresponding period of 2019, or infra-annual forecasts; impacts on sales due to lower demand for electricity and gas are based on analyses founded on consumption forecast models that take account of other effects (weather effects, portfolio changes, etc.); impacts on nuclear power output are based on analyses of generation by plants in operation (particularly for modulation) and detailed analyses of outages for units that had a scheduled outage in 2020 after the pandemic crisis began, whether for fuel reloading or for regular maintenance, by comparison of activities and time spent on outages in the crisis context in 2020 with a model of outages and the actual work completed in 2019;
- the estimates calculated aim to assess the financial impacts of the Covid-19 pandemic regarding the downturn in business activity, and volumes sold and produced. These estimates do not include impacts of crisis-correlated price effects such as observed market prices over the period, due to the difficulty of attributing them directly and solely to the pandemic. Furthermore, these impacts do not include the effects of action plans implemented by the Group in response to the pandemic;
- additional expenses incurred in connection with the public health crisis (protective equipment, hand sanitiser, etc.), or assessment of the specific measures or risks associated with the crisis, are based on figures recorded in the accounting information system.

The resulting estimated impact of the Covid-19 pandemic on Operating profit before depreciation and amortisation at 31 December 2020 is some €(1,479) million (at 30 June it was some €(1,010) million). This impact mainly concerns the following business segments: France - Generation and Supply (€(872) million against €(482) million in the first half-year), France - Regulated activities (€(237) million against €(212) million in the first half-year) and the United Kingdom (€(182) million against €(128) million in the first half-year). The pandemic's estimated impacts on the Group's other business segments are less material given the consolidated operating profit before depreciation and amortisation at that date, and mainly concern Dalkia (€(40) million against €(39) million in the first half-year), Framatome (€(47) million against €(37) million in the first half-year), and Italy (Edison) (€(60) million against €(47) million in the first half-year).

Some estimates reflecting the information known to the Group at 31 December 2020, notably concerning the risk of non-recovery of customer receivables, are uncertain by nature. The final situation would differ from the year-end estimates, depending on how the crisis ends, and more broadly the economic consequences in 2021.

Finally, it should be noted that the financial result has been significantly impacted by the decline on the financial markets, through changes in the fair value of financial instruments in the first half-year (see note 12 to the condensed consolidated half-year financial statements). The behaviour of the financial markets in the second half-year, combined with the Group's allocation approach for portfolio management, led to clearly positive changes in the fair value of financial instruments at 31 December 2020 (see note 8).

The Group has also recognised impairment in 2020 that among other factors reflect indirect effects of the pandemic (see note 10.8).

1.4.1.1 Liquidity risk

As reported in the condensed consolidated half-year financial statements, at 30 June 2020 the Group had a strong liquidity position of €40.9 billion (cash, cash equivalents and available-for-sale liquid financial assets at gross value, including securities transferred under repurchase agreements which amounted to €6.5 billion in the first half of 2020 in the context of the Covid-19 pandemic), and unused credit lines with banks amounting to €10.9 billion (see notes 23.2.3 and 23.3 to the condensed consolidated half-year financial statements).

At 31 December 2020 the Group had a strong liquidity position of €32.4 billion at gross value (cash, cash equivalents and available-for-sale liquid financial assets, including unused credit lines with banks amounting to €11.1 billion (see notes 18.4 and 19.2).

1.4.1.2 Sales and Trade receivables

Impairment of trade receivables

The Group calculates impairment of trade receivables by reference to provision matrices based on credit loss histories (the IFRS 9 simplified approach).

Despite the support measures introduced by national governments, and the support measures put in place by the Group for its customers, the Covid-19 pandemic should result in an increase in the amount of non-recoverable receivables which was not yet very visible at 31 December 2020. The risk analyses conducted by different Group entities have led to a €223 million increase to impairment of trade receivables resulting from the pandemic, under other operating income and expenses in the income statement. This amount comprises €80 million concerning the France – Generation and Supply segment, €58 million for the France – Regulated activities segment, €68 million for the United Kingdom, and €13 million for Belgium. The credit risk on EDF Trading's portfolio was also increased by an amount of €22 million in Sales (Trading).

This increase in impairment results primarily from the fact that the provision matrices habitually used are applied to a broader base of receivables in the portfolio reflecting longer payment times as a result of the pandemic, particularly in the Business customer segment in France, and the United Kingdom. It is also explained by adjustments made to the provision matrices *via* post-model corrections to take account of the specific situation brought about by the Covid-19 pandemic which was not reflected in the existing models. To determine these corrections, differentiated approaches were introduced for each country and customer type (residential customers and business customers by industry sector).

In France, in the Residential customer segment, the increase in the credit risk remains moderate at this stage (as most of customers in the portfolio pay by direct debit and so far no increase in debit rejections has been observed; also, support measures for customers in difficulty have been introduced). Nevertheless, corrections were applied, by increasing the provision rate for all doubtful trade receivables arising since the start of the pandemic that are considered at greater risk of becoming non-recoverable than the receivables less than 12 months old used to construct the existing provision matrices, and by increasing the provision rate for current receivables, notably based on an INSEE (French statistical office) study of October 2020 of the economic consequences of lockdown on household finances, taking account of prospects of a rise in France's unemployment rate following the Covid-19 pandemic.

In the Business customer segment, at the top end of the portfolio (large customers), case-by-case monitoring referring to external credit ratings did not indicate any material increase in the credit risk. At the bottom end and middle of the portfolio (small and medium-sized businesses, very small businesses), provision matrices were corrected for the business sectors in this portfolio deemed to entail the highest risk, in order to reflect a probable increase in the default rate (based, among other things, on external macroeconomic forecasts, for example publications by credit insurance companies such as Coface or Euler Hermes). The data available at the year-end instead suggest that the level of default observed by businesses is in fact lower in 2020 than the previous year; this is attributed to a "delay effect". The forecast default rates used at the year-end therefore incorporate the likelihood of an increased risk in 2021 in the expected credit loss.

In the France – Regulated activities segment, the increase in impairment of trade receivables primarily reflects the risk on the delivery component of the invoice to the final customer.

In the United Kingdom, a similar approach was used, separating Residential and Business customers and referring to portfolio and business segments as appropriate to the country's situation. In particular, the probable increase in the default rate for businesses is considered to be higher than in France.

In Italy, in view of non-recourse assignments of receivables and credit insurance agreements, the increase in the credit risk is considered low.

Assignment of trade receivables

Some group entities make use of non-recourse assignment programmes for trade receivables. The assignees in the programme have not tried to renegotiate any contractual clauses that would affect the non-recourse nature of their contracts.

ARENH dispute – Force majeure

The Covid-19 pandemic and the emergency measures introduced by France's public authorities from 17 March 2020 led to a decline in electricity consumption by non-residential clients that affected all market players, including EDF.

Faced with this decline in electricity consumption, some suppliers wanted to reconsider their contractual commitments, citing force majeure to reduce the volumes they had purchased from EDF in November 2019 under the ARENH mechanism.

Confirming the French Energy Regulation Committee's (CRE's) decision of 26 March, on 17 April the French Council of State rejected an appeal filed by two energy supplier associations, considering that the losses incurred by the energy suppliers concerned were not "such that they would jeopardise (…) the survival of the businesses over a horizon of a few months" and that "these losses would have such an impact during the timeframe required by the competent judge to make a ruling on the claims".

On 20, 26 and 27 May 2020, after summary proceedings the Paris Commercial Court ruled that the introduction of emergency measures by the French government constituted a force majeure event for the ARENH contracts with Alpiq, Gazel and Total Direct Energie, entailing suspension of those contracts. On 28 July 2020, the Paris Court of Appeal upheld the urgent application judge's decision. EDF has appealed against this ruling. Total Direct Energie is the only remaining party in the ongoing proceedings.

On 2 June 2020 [(1)], EDF notified the energy suppliers Alpiq, Gazel and Total Direct Energie of the termination of their ARENH contracts, as allowed when these contracts are suspended for more than two months. This decision was made as a precautionary measure to protect EDF's rights.

A challenge to this termination was taken before the urgent applications judge, who issued a ruling concerning Total Direct Energie on 1 July 2020 that temporarily suspended the effects of EDF's contract termination letter. On 19 November 2020 the Paris Court of Appeal overturned that ruling and restored the effects of the termination notified by EDF on 2 June 2020.

In the meantime, three energy suppliers notified EDF of the end of the force majeure event in mid-June and ARENH deliveries resumed. As the CRE did not allow EDF's request to suspend ARENH deliveries to Total Direct Energie for the end of the year, in application of the Paris Court of Appeal decision of 19 November, on 10 December 2020 EDF brought a claim before the Council of State for abuse of power, requesting cancellation of the CRE's decision.

The suspension of deliveries to these three suppliers for approximately 15 days (from the ruling by the Paris commercial court in summary proceedings, to the notification of the end of force majeure by the suppliers), and the continuation of deliveries to Total Direct Energie, represents some tens of millions of euros in lost income for EDF at 31 December 2020 (due to the price effect of volumes being sold at market prices instead of ARENH prices during that period).

Further summary proceedings were initiated in late September 2020 by Ohm Energie, seeking a suspension of payments due for ARENH volumes, claiming that deliveries had been continued illegally by EDF since it had requested suspension of ARENH deliveries from April to June 2020 due to force majeure. On 23 October 2020 the Paris Commercial Court rejected all of Ohm Energie's claims.

(1) See the press release of 2 June 2020: EDF has notified three energy suppliers of the termination of their ARENH contracts.

In parallel to the above summary proceedings, cases concerning the substance of the matter were brought before the Paris Commercial Court by several ARENH applicants, claiming compensation from EDF for the prejudice caused by its allegedly illegal refusal to apply the force majeure clause. These cases are ongoing.

1.4.1.3 Property, plant and equipment

Gross investments in intangible assets and property, plant and equipment in 2020 amounted to €16,007 million (see note 4) compared to €16,797 million in 2019, a decrease of €790 million. These amounts include capitalised production costs totalling €7,888 million in 2020 (charged to other external expenses, which are reported net of those items in the income statement) and €7,932 million in 2019.

The Covid-19 pandemic had a moderate overall impact at Group level on gross investments in intangible assets and property, plant and equipment compared to 2019, although the nature and scale of its effects varied in different Group entities.

With the introduction of national lockdowns and practices to prevent the virus spreading, which differed across countries and regions, some work projects were suspended and deferred, while others continued but at a much slower pace or over a longer period. Resumption of work has varied in speed and intensity in the second half of the year, depending on the activities concerned and the countries where the Group operates. Some work, much of it engineering work, could be done remotely.

The new public health measures themselves have sometimes generated additional costs, principally resulting from additional protective activities, tension on external resources in some fields of work, and longer completion time for certain operations (due to adoption of practices to stop the virus spreading, limits on the number of workers on site, etc.). Additional costs directly attributable to continuation of site work and completion of assets have been capitalised, in accordance with IAS 16. No significant effect resulting from low production activity ("*sous-activité*") that might have been capitalised was identified at 31 December 2020. The costs of demobilising and remobilising personnel for the deferred and suspended worksites are recorded as expenses.

For the France - Generation and Supply segment, gross investments decreased by €588 million between 2019 and 2020 (see note 4). Most of this decrease was unrelated to Covid-19 effects, which were as follows:

- some scheduled reactor outages at nuclear plants in operation were deferred, while the duration of outages was extended, entailing higher costs. On 29 October 2020, EDF announced an adjusted cost for the Grand Carénage programme to 2025. The new cost estimate mainly reflects the first findings on the work to be conducted for the fourth ten-year inspections of the Group's 900MW reactors, and the revised duration of scheduled maintenance outages based on experience from previous year and the impacts of the Covid-19 pandemic for the period 2020- 2022;
- work on hydropower projects was suspended, apart from required safety and security work (or completion of essential work), from 17 March 2020 and resumed from mid-April and the pace of work was practically back to normal by the end of May;
- the majority of nuclear engineering work could be done remotely;
- after a Covid-19 outbreak was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only. On-site work for the Flamanville 3 project resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020; based on work in the second half-year, the Covid-19 pandemic ultimately had a non-significant impact on 2020 investments in Flamanville 3 compared to 2019; knowing that the exceptional additional costs of repair work on the main secondary circuit welds in the Flamanville 3 EPR were recorded as other income and expenses (see note 7).

Enedis (France – Regulated activities segment) stopped work during France's lockdown on connections, grid modification, and the network generally, and suspended Linky meter installations. Resumption of work at a brisk pace since 11 May 2020 reduced the backlog, particularly for installation of Linky meters. As a result of these effects, gross investments by the France – Regulated activities segment (which also includes Électricité de Strasbourg and the island activities) were €423 million lower in 2020 than 2019, an amount similar to the decrease observed in the first half of 2020 and mainly attributable to the effects of the pandemic.

In the United Kingdom, work on the Hinkley Point C project slowed down in April 2020 due to the lower number of people working on site at a stage of significant development. Gross investments by EDF Energy increased by €133 million between 2019 and 2020.

EDF Renewables saw a slight rise of €42 million in gross investments compared to 2019, mainly driven by projects in North America.

The value of property, plant and equipment reported by the Group also includes interest expenses on financing of assets incurred during the construction period in the case of qualifying assets as defined by IAS 23 "Borrowing costs". When development of an asset is suspended for a long period, capitalisation of interest must also be suspended. This was the case for the Flamanville EPR project, where capitalisation of the associated interest was suspended between 16 March and 30 June 2020, resulting in a €120 million increase in financial expenses at 31 December 2020.

1.4.1.4 Provisions

Capacity mechanism – imbalance settlement payments

In view of the significant downward revision during the first half-year of estimates of nuclear power output in France for 2020, and the results of the capacity auction held on 25 June 2020, EDF considered in its half-year financial statements that it was likely to be required to make imbalance settlement payments for the delivery year 2020, and recorded a provision of €137 million for this purpose at 30 June 2020 (see note 5.1 for details of the operation of France's capacity mechanism). In view of the final output achieved in 2020, and particularly the availability of EDF generation plants during the peak periods of the second half of the year, this provision was cancelled in the second half-year since EDF had fulfilled its obligations relating to the French capacity mechanism.

Provisions for onerous contracts

The Group has updated its provisions for onerous contracts (mainly gas purchase contracts and some customer contracts), principally to reflect changes in market price scenarios (see notes 5.2 and 17.2). No new significant onerous contracts were identified.

Decommissioning provisions for permanently shut-down nuclear power plants

Ongoing work on the decommissioning was halted from 16 March 2020. On these sites, only the regulatory activities (monitoring the environment, site safety and security) continued. Work first resumed on 11 May 2020.

The temporary deferral of certain types of on-site decommissioning work led to a €45 million increase to provisions for decommissioning concerning nuclear plants currently being dismantled at 31 December 2020.

1.4.1.5 Government support measures

As a result of the Covid-19 pandemic, certain Group entities in France have had to suspend or slow down their activities, and made use of the furlough scheme set up by the government. At 31 December 2020 the indemnities received amount to €18 million and have been recognised as a deduction from personnel expenses.

During the pandemic some States extended deadlines for payment of taxes. EDF Energy, among other Group entities, has made use of these measures and deferred its monthly VAT payments. The amount concerned was £117 million at 30 June 2020 and around £104 million at 31 December 2020.

1.4.1.6 Other assets, liabilities, income and expenses

In addition to the information in the previous paragraphs, the Covid-19 pandemic did not involve any other specific use of judgements, estimates or assumptions for determination of the value of assets and liabilities, income and expenses of the period (compared to those described in note 1.3).

1.4.2 IFRS 5 "Sale of Edison's E&P Operations"

Edison Exploration and Production manages all activities, mining titles and shareholdings of Edison and the Group in the hydrocarbons business in Italy and internationally.

On 4 July 2019, Edison announced the signature of an agreement with Energean Oil and Gas for the sale of 100% of Edison E&P (Exploration and Production), which manages all the EDF group's hydrocarbons sector activities, mining titles and corporate shareholdings in Italy and abroad.

The EDF group consequently classified the sale of the E&P operations as a discontinued operation as defined by IFRS 5 in its financial statements at 31 December 2019 (see note 2 to the consolidated financial statements at 31 December 2019).

On 23 December 2019, Edison disclosed that the sale to Energean Oil and Gas was still awaiting government authorisations regarding its E&P assets in Algeria.

After the Algerian authorities refused to authorise the sale of those assets, on 2 April 2020 Edison's Board of Directors approved the signature of an amendment to the disposal agreement, excluding the Algerian E&P assets from the scope of the agreement of 4 July 2019.

Then following the announcement by Energean on 19 May 2020 that the proposed sale of Edison's E&P operations in Norway to Neptune Energy was to be terminated, a second amendment was signed on 28 June 2020, excluding the Norwegian subsidiary from the agreement. The acquisition process and its new scope was approved by Energean at an Extraordinary General Shareholders' Meeting on 20 July 2020.

On 17 December 2020 Edison and Energean finalised the sale of Edison Exploration and Production S.p.A. in the hydrocarbons (oil and natural gas) exploration and production business. The sale price was based on an enterprise value of $284 million, with an additional consideration of a maximum $100 million upon commissioning of the Cassiopea gas project in Italy, depending on the PSV gas price at the time of the first delivery.

Edison also signed an agreement on 30 December 2020 for the sale of the Norwegian operations to Sval Energi. This operation requires the approval of the Norwegian authorities and should be completed during the first half of 2021 (see the Edison press release of 30 December 2020).

1.4.2.1 Presentation of E&P's operations at 31 December 2019, excluding Algeria and Norway

Due to this situation, in application of IFRS 5, at 31 December 2020 the amounts of Edison's Algerian E&P assets and liabilities are presented in the consolidated balance sheet as continuing operations, while the Norwegian A&P operations are presented in the consolidated balance as discontinued operations.

The net income and the net change in cash for the Algerian and Norwegian E&P operations are reported in the specific line "Net income of continuing operations" and allocated to the relevant lines of the income statement and cash flow statement for the periods published, *i.e.* 2020 and the comparative figures for 2019.

The net income of discontinued operations, and the net change in cash of discontinued operations, corresponding to Edison's E&P operations excluding the Algerian and Norwegian E&P operations, are still reported on a specific line in the income statement and cash flow statement for the periods published, until finalisation of the sale which took place on 17 December 2020. At 31 December 2020, the assets and liabilities of discontinued operations include the E&P operations in Norway and are presented in note 3.2.

In this new situation, the impacts on the Group's income statement and cash flow statement of application of IFRS 5 at 31 December 2019 are presented below.

Impacts on the 2019 income statement

(in millions of euros)	2019 as published	IFRS 5 adjustments	2019 restated
Sales	71,317	30	71,347
Fuel and energy purchases	(35,091)	-	(35,091)
Other external expenses	(8,619)	(6)	(8,625)
Personnel expenses	(13,793)	(4)	(13,797)
Taxes other than income taxes	(3,798)	-	(3,798)
Other operating income and expenses	6,692	(5)	6,687
Operating profit before depreciation and amortisation	**16,708**	**15**	**16,723**
Net changes in fair value on energy and commodity derivatives, excluding trading activities	642	-	642
Net depreciation and amortisation	(10,002)	(18)	(10,020)
(Impairment)/reversals	(403)	-	(403)
Other income and expenses	(185)	-	(185)
Operating profit	**6,760**	**(3)**	**6,757**
Cost of gross financial indebtedness	(1,806)	-	(1,806)
Discount effect	(3,161)	-	(3,161)
Other financial income and expenses	4,606	(3)	4,603
Financial result	**(361)**	**(3)**	**(364)**
Income before taxes of consolidated companies	**6,399**	**(6)**	**6,393**
Income taxes	(1,581)	49	(1,532)
Share in net income of associates and joint ventures	818	-	818
Net income of discontinued operations	(454)	(43)	(497)
CONSOLIDATED NET INCOME	**5,182**	**-**	**5,182**
EDF net income	**5,155**	**-**	**5,155**
Net income of continuing operations	5,597	42	5,639
Net income of discontinued operations	(442)	(42)	(484)
Net income attributable to non-controlling interests	**27**	**-**	**27**
Net income of continuing operations	39	1	40
Net income of discontinued operations	(12)	(1)	(13)

Impacts on the 2019 consolidated cash flow statement

(in millions of euros)	2019 as published	IFRS 5 adjustments	2019 restated
Operating activities:			
Consolidated net income	**5,182**	**-**	**5,182**
Net income of discontinued operations	**(454)**	**(43)**	**(497)**
Net income of continuing operations	**5,636**	**43**	**5,679**
Impairment/(reversals)	403	-	403
Accumulated depreciation and amortisation, provisions and changes in fair value	8,328	30	8,358
Financial income and expenses	97	4	101
Dividends received from associates and joint ventures	349	-	349
Capital gains/losses	(508)	-	(508)
Income taxes	1,581	(49)	1,532
Share in net income of associates and joint ventures	(818)	-	(818)
Change in working capital	452	23	475
Net cash flow from operations	***15,520***	***51***	***15,571***
Net financial expenses disbursed	(798)	(4)	(802)
Income taxes paid	(922)	7	(915)
Net cash flow from continuing operating activities	**13,800**	**54**	**13,854**
Net cash flow from operating activities relating to discontinued operations	**222**	**(54)**	**168**
Net cash flow from operating activities	**14,022**	**-**	**14,022**
Investing activities:			
Acquisitions of equity investments, net of cash acquired	(456)	-	(456)
Disposals of equity investments, net of cash transferred	293	-	293
Investments in intangible assets and property, plant and equipment	(16,709)	(88)	(16,797)
Net proceeds from sale of intangible assets and property, plant and equipment	94	-	94
Changes in financial assets	1,294	-	1,294
Net cash flow from continuing investing activities	**(15,484)**	**(88)**	**(15,572)**
Net cash flow from investing activities relating to discontinued operations	**(166)**	**88**	**(78)**
Net cash flow from investing activities	**(15,650)**	**-**	**(15,650)**
Financing activities:			
Cash flows with shareholders	***828***	**-**	***828***
Other cash flows from financing activities	***1,414***	**-**	***1,414***
Net cash flow from continuing financing activities	**2,242**	**-**	**2,242**
Net cash flow from financing activities relating to discontinued operations	**(19)**	**-**	**(19)**
Net cash flow from financing activities	**2,223**	**-**	**2,223**
Net increase/(decrease) in cash and cash equivalents from continuing operations	558	(34)	524
Net increase/(decrease) in cash and cash equivalents from discontinued operations	37	34	71
Net increase/(decrease) in cash and cash equivalents	**595**	**-**	**595**
CASH AND CASH EQUIVALENTS – OPENING BALANCE	**3,290**	**-**	**3,290**
Net increase/(decrease) in cash and cash equivalents	595	-	595
Effect of currency fluctuations	(5)	-	(5)
Financial income on cash and cash equivalents	17	-	17
Effect of reclassifications	37	-	37
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	**3,934**	**-**	**3,934**

1.4.2.2 Impact of the sale of Edison's E&P operations on the consolidated financial statements at 31 December 2020

The impact at 31 December 2020 of the sale of the E&P operations (excluding the Algerian and Norwegian assets) is €(117) million on consolidated net income (the "Net income of discontinued operations" line), after impairment determined as the difference between the net consolidated value of the discontinued operation and the sale price including an estimation of the additional consideration (see note 10.8).

This sale reduced the EDF group's net indebtedness by €187 million.

Note 2 Summary of significant events

Apart from the Covid-19 pandemic presented in note 1.4.1 and the sale of the E&P operations presented in note 1.4.2, the main significant events and transactions for the Group **in 2020** are the following:

- **Nuclear developments:**
  - EDF restarted Hunterston B power station and confirmed its plan to move into the decommissioning phase by January 2022. It also announced that Hinkley Point B power station in Somerset will enter into the defueling phase no later than 15 July 2022 (see the EDF Energy press release of 27 August 2020 and 19 November 2020, and note 10.8);
  - the Group readjusted the cost of the *Grand Carénage* programme to increase safety and extend the operating life of nuclear reactors beyond 40 years (see the press release of 29 October 2020 and note 10.6);
  - Hinkley Point C project update (see the press release of 27 January 2021 and notes 10.6 and 10.8).
- **Financing operations:**
  - EDF made a landmark offering of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs vertes*) (see the press releases of 8 September 2020 and note 18.3.2.2 and 14.5);
  - EDF raised €2.1 billion through two issues of hybrid notes (see the press release of 8 September 2020 and note 14.4.2);
  - EDF and Standard Chartered Bank signed a €200 million credit facility indexed on ESG criteria (see the press release of 30 October 2020 and note 18.4).
- **Renewable energies:**
  - EDF Renewables, Enbridge and wpd began construction of the Fécamp offshore wind farm (see the press release of 2 June 2020 and note 12.3);
  - the EDF and CEI groups became partners for the construction and operation of offshore wind power projects in China (see the press release of 2 June 2020 and note 12.3);
  - EDEN Renewables India increased its portfolio with 1,350MWp of new solar photovoltaic power plants (see the EDF Renewables press release of 1 October 2020 and note 12.3);
  - EDF Renewables - Jinko Power consortium reached the financial closing of the world's largest solar project and launched its construction in Abu Dhabi (see the press release of 22 December 2020 and note 12.3);
  - EDF commissioned the new Romanche-Gavet hydroelectric plant, France's biggest hydropower project (97MW) (see the press release of 9 October 2020);
  - fifth anniversary of the Paris Agreement: EDF stepped up its ambitions and made new climate commitments (see the press release of 10 December 2020 and note 20).

The main significant events and transactions for the Group **in 2019** were the following:

- **Nuclear developments:**
  - Flamanville 3 EPR: following the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle, the ASN's decision regarding repairs to the penetration welds led to revision of the project costs and timetable (see the press release of 11 April 2019, 20 June 2019, 26 July 2019, 9 October 2019 and note 10.6);
  - Hinkley Point C: a review of the HPC project's costs, schedule and organisation was undertaken (see the press release of 25 September 2019 and note 10.6).
- **Renewable energies:**
  - The EDF group began construction of the Scottish 450MW offshore wind farm Neart na Gaoithe (NnG) with its new Irish partner ESB, which took a 50% stake in the project (see the press release of 28 November 2019 and notes 3.1 and 5.4.2).

France multi-year energy programme (PPE)

The PPE covering the periods 2019-2028 was adopted by decree 2020-456 of 21 April 2020, published in the *Journal officiel* of 23 April 2020. The points on which the final programme differs from the drafts published on 25 January 2019 and 20 January 2020 essentially relate to renewable energies. The PPE sets a target of doubling the 2017 level of installed capacity for electricity from renewable energies by 2028, and increasing offshore wind power capacities, with 6 project tenders to be launched in the first PPE period. EDF's strategy is entirely consistent with this aim.

To reduce nuclear power output, as well as the closure of the two Fessenheim reactors in the spring of 2020, 12 nuclear reactors will have to be shut down by 2035 (see note 5.4.3). The reactors concerned will be shut down when their fifth 10-year inspection is due, except for 2 reactors which will be shut down earlier in 2027 and 2028 (two additional reactors could also be shut down in 2025-2026 if certain conditions relating to electricity prices and secure supply are fulfilled). Priority will be given to shutdowns that minimise the economic and social impact, have the lowest impact on the electricity network, and do not entail closure of an entire site. At the request of the French government, based on these criteria, on 20 January 2020 EDF proposed to examine the possibility of shutting down pairs of reactors at the sites of Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin. The PPE stipulates that early reactor shutdowns will be confirmed 3 years prior to implementation.

Adoption of the PPE in April 2020 led to re-estimation of nuclear provisions at 30 June 2020, referring to various scenarios for the early shutdowns of two reactors in 2027 and 2028. This resulted in a €32 million increase in provision related to nuclear generation on 31 December 2020 (mainly decommissioning provisions, see note 15.1.1.3). Accelerated depreciation periods were also estimated based on these scenarios, leading to an increase in depreciation in the second half of the year, with no significant impact on the consolidated financial statements (see note 1.3.4.1).

The reactor shutdowns at the Fessenheim plant took place on 22 February 2020 for reactor 1 and 30 June 2020 for reactor 2, in accordance with decree 2020-129 of 18 February 2020 terminating the plant's operating licence (see note 5.4.3).

Public consultation on regulation of existing nuclear facilities

As announced in the draft PPE published on 25 January 2019, in January 2020 the French government launched a call for contributions regarding the fundamental findings driving the plan to reform the economic regulations for existing nuclear facilities, and their construction and operating principles. The proposed regulations would replace the ARENH mechanism and require EDF to provide a service of general economic interest (SGEI) for protection of the consumer and the climate to the benefit of all French consumers, ensuring transparency and non-discrimination.

This SGEI would be supported by economic regulation of the existing nuclear fleet, to reconcile and contribute to the following aims:

- long-term protection of all consumers located on French territory, regardless of their supplier and with respect to some of their non-peak power supplies, by enabling them to benefit from stable conditions for carbon-free, manageable production of electricity by the existing nuclear fleet they helped to finance;
- achievement of the climate targets France has set itself, and also of its objectives for a secure power supply and energy independence, by safeguarding the carbon-free electricity supply in France and more broadly in Europe, through secure long-term financing for operation of the existing nuclear installations that are necessary for that supply.

Like many other actors in the sector, the EDF group participated in this consultation, which ended on 17 March 2020.

In this context, France's Minister for the Ecological and Inclusive Transition and Minister of the Economy and Finance commissioned the CRE to carry out an assessment of the costs borne by the nuclear operator, and to determine fair remuneration for its nuclear activities under the government's potential future regulations. At a hearing before the French National Assembly's Economic Affairs Committee on 7 July 2020, the CRE Chairman Jean-François Carenco stated that the CRE had sent its report on the cost of nuclear power in France to the government. The CRE also presented the conclusions of that report to the European Commission's Directorate-General for Competition on 16 July 2020.

The terms and conditions of new regulations governing existing nuclear facilities are currently being examined by the French government and the European Commission.

Note 3 Scope of consolidation

Accounting principles and methods

Controlled entities

Subsidiaries are companies in which the Group exercises exclusive control and are fully consolidated. The Group controls an entity when the three following conditions are fulfilled:

- it holds power over the entity;
- it is exposed, or has rights, to variable returns from its involvement with the entity;
- it has the ability to use its power to affect the amount of the investor's returns.

The Group considers all facts and circumstances when assessing control. All substantive potential voting rights exercisable, including by another party, are also taken into consideration.

Investments in associates and joint ventures

An associate is an entity in which the Group exercises significant influence on financial and operational policies without having exclusive or joint control. Significant influence is presumed to exist when the Group's investment is at least 20%.

A joint venture is a partnership in which the parties (joint venturers) that exercise joint control over the entity have rights to the entity's net assets. Joint control is the contractually agreed sharing of control of an entity operated jointly by a limited number of partners or shareholders, such that the financial and operational policies result from unanimous consent of the parties.

Investments in associates and joint ventures are accounted for by the equity method. They are carried in the balance sheet at historical cost, adjusted for the share in net assets generated after the acquisition, less any impairment. The share in the net income for the period is reported in "Share in net income of associates and joint ventures" in the income statement (see note 12).

Investments in joint operations

A joint operation is a joint arrangement in which the parties (joint operators) that exercise joint control over the entity have direct rights to its assets, and obligations for its liabilities. The Group, as an operator in a joint operation, reports the assets and liabilities and income and expenses related to its investment line by line.

The Group's principal joint operations are the LNG optimisation activities of Jera Global Markets, co-owned by EDF Trading, and the gas storage operator activity carried out by Friedeburger Speicherbetriebsgesellschaft mbH (FSG).

Business combinations

In application of IFRS 3 business combinations arising since 1 January 2010 are measured and recognised under the following principles:

- at the date of acquisition, the identifiable assets acquired and liabilities assumed, measured at fair value, and any non-controlling interests in the Company acquired (minority interests) are recorded separately from goodwill;
- non-controlling interests may be valued either at fair value (full goodwill method) or their share in the fair value of the net assets of the acquired company (partial goodwill method). The decision is made individually for each transaction;
- any acquisition or disposal of an investment in a subsidiary that does not affect control is considered as a transaction between shareholders and must be recorded directly in equity;
- if additional interests are acquired in a joint venture, joint operation or associate without resulting in acquisition of control, the value of the previously-acquired assets and liabilities remains unchanged in the consolidated financial statements;
- if control is acquired in stages, the cost of the business combination includes the fair value, at the date control is acquired, of the purchaser's previously-held interest in the acquired company;
- related costs directly attributable to an acquisition leading to control are treated as expenses for the periods in which they were incurred, except for issuance costs for debt securities or equity instruments, which must be recorded in compliance with IAS 32 and IFRS 9;
- IFRS 3 does not apply to common control business combinations, which are examined on a case-by-case basis to determine the appropriate accounting treatment;
- commitments given by the Group to purchase minority interests in Group-controlled companies are included in liabilities. For commitments of this kind given since 1 January 2010, the date of the Group's first application of IAS 27 (amended) and IFRS 3 (revised), the differential between the value of the non-controlling interests and the liability corresponding to the commitment is recorded in equity.

3.1 Changes in the scope of consolidation

3.1.1 Changes in the scope of consolidation in 2020

The following changes took place in the Group's scope of consolidation during 2020:

- disposal of Edison Exploration and Production S.p.A. (E&P) on 17 December 2020 (see notes 1.4.2 et 3.2);
- consolidation of EDF Pulse Croissance, Agregio, Energy2Market (E2M) and IZIVIA (see note 3.3).

3.1.2 Changes in the scope of consolidation in 2019

The following changes took place in the Group's scope of consolidation during 2019:

- disposal of EDF's 25% stake in Alpiq in May 2019 (see note 12);
- sale of 50% of the NnG project to the Irish electricity company ESB on 4 December 2019 (see note 5.4.2).

The principal acquisitions in renewable energies in 2019 were the following:

- EDF Renewables completed its acquisition of LUXEL Group, a French utility that develops and operates solar projects;
- in the United Kingdom, the acquisition of Pivot Power accelerated development in battery storage and electric vehicle (EV) charging infrastructures.

Disposal of EDF's 25% stake in Alpiq

On 4 April 2019 EDF, EBM (Coopérative Elektra Birseck) and EOS (EOS Holding SA) signed an agreement on EDF's disposal of its stake in Swiss power producer Alpiq (25.04% of the company's capital and voting rights) to EBM and EOS (each entity acquiring half of this stake).

This operation valued EDF's stake in Alpiq at approximately CHF489 million (around €434 million), based on a purchase price of CHF70 per Alpiq share. It reduced the Group's net indebtedness by €434 million. The Shares Purchase Agreement included potential earn-out mechanisms. The sale was completed on 28 May 2019 after it received clearance from the German competition authority.

The impact on the consolidated net income was not significant.

Sale of 50% of the Scottish offshore wind farm Neart na Gaoithe (NnG) to ESB

On 28 November 2019 the EDF group announced the construction of the Scottish Neart na Gaoithe [1] (NnG) offshore wind farm project and a new partnership with the Irish electricity company ESB, which is taking a 50% stake in the project, acquired in May 2018 from Mainstream Renewable Power.

The 450MW NnG project is part of EDF's offshore wind power development strategy and confirms its position in carbon-free energy production in the United Kingdom, a country where EDF already has a strong footprint in both nuclear and renewable power.

This sale operation was completed on 4 December 2019 and accounted for a large share of EDF Renewables' gains on sales of generation assets in 2019 (a total €560 million, recorded in other operating income and expenses). It also contributed a €1.2 billion reduction in the EDF group's net indebtedness, due to the debt-reducing effect of loss of control over NnG.

Following this sale, the 50% holding in NnG, stated at fair value, is accounted for by the equity method.

Acquisition in renewable energies – acquisition of the LUXEL Group

On 28 March 2019, EDF Renewables acquired the Luxel Group, an independent photovoltaic energy operator in France which holds a portfolio of 1GWc, mainly comprising projects ready to be constructed or currently being developed, and a few power plants already in operation. This acquisition reinforced EDF Renewables' position in solar power in France, with a view to achieving the objectives in EDF's Solar Plan.

Acquisition of Pivot Power

On 4 November 2019 the EDF group announced the acquisition of a British start-up called Pivot Power, specialising in battery storage and electric vehicle charging infrastructures. This move, is part of EDF's electricity storage plan and will enable EDF, already the largest low-carbon electricity producer in the UK, to become a leader in battery storage there.

Pivot Power has an extensive portfolio of battery storage projects across more than 40 locations throughout the UK, with a total capacity of close to 2GW. There are plans to install batteries connected directly to the high-voltage transmission system. The first two storage projects located at Kemsley (Kent) and Cowley (Oxford), are under construction at 31 December 2020 and should be commissioned during 2021.

3.2 Discontinued operations

Accounting principles and methods

Assets that qualify as held for sale and related liabilities are disclosed separately from other assets and liabilities in the balance sheet.

When assets or groups of assets are classified as discontinued operations, income and expenses relating to these discontinued operations are disclosed in a single net amount after taxes in the income statement and net changes in cash and cash equivalents of discontinued operations are also reported separately in the cash flow statement.

Impairment is booked when the realisable value is lower than the net book value.

In accordance with IFRS 5:

- for assets or groups of assets that are identified and classified as held for sale during the year, there is no change of presentation or retrospective restatement in prior year balance sheets;
- assets or groups of assets that qualify as discontinued operations are restated in the income statement and the cash flow statement for the prior periods presented in the financial statements.

3.2.1 Assets held for sale and related liabilities

(in millions of euros)	31/12/2020	31/12/2019
ASSETS HELD FOR SALE	**2,296**	**3,662**
LIABILITIES RELATED TO ASSETS HELD FOR SALE	**108**	**1,043**

In application of IFRS 5, assets held for sale and related liabilities are shown below:

(in millions of euros)	31/12/2020	31/12/2019
Non-current non-financial assets [1]	316	893
Non-current financial assets	1,811	1,925
Current non-financial assets [2]	151	784
Current financial assets	18	60
TOTAL ASSETS HELD FOR SALE	**2,296**	**3,662**

(in millions of euros)	31/12/2020	31/12/2019
Non-current non-financial liabilities [3]	86	711
Non-current financial liabilities	1	34
Current non-financial liabilities	21	298
Current financial liabilities	-	-
TOTAL LIABILITIES RELATED TO ASSETS HELD FOR SALE	**108**	**1,043**

(1) Non-current non-financial assets comprise tangible assets and property, plant and equipment.
(2) Current non-financial assets comprise components of working capital and deferred taxes.
(3) Non-financial assets comprise provisions.

(1) Gaelic for "strength of the wind".

At 31 December 2020, assets held for sale and related liabilities concern the following:

- **the sale in progress of Edison's Norwegian E&P operations** (see note 1.4.2);
- **the sale in progress of Infrastrutture Distribuzione Gas (IDG),** a fully-owned subsidiary of Edison.

The IDG assets held for sale and related liabilities amount to €98 million and €7 million respectively at 31 December 2020.

In September 2020, Edison began discussions with 2i Rete Gas for the sale of its subsidiary IDG, which manages the gas networks and distribution plants for 58 towns in the Abruzzo region. These discussions led to signature of an agreement in January 2021. Finalisation of the sale, which is subject to approval under antitrust regulations, is expected to rake place in the first half of 2021 (see the Edison press release of 14 January 2021).

- **the sale in progress of the investment in CENG.**

The shares held in CENG are included in assets held for sale at the value of €1,811 million at 31 December 2020 (€1,925 million at 31 December 2019).

CENG owns five nuclear reactors across three nuclear power plants located in the states of New York and Maryland, with total capacity of 4,041MW (company-owned capacity). EDF has held a 49.99% share since 2014, alongside Exelon which controls CENG.

Pursuant to the agreements concluded with Exelon in 2014 [(1)], EDF notified Exelon on 20 November 2019 that it had decided to exercise its put option on 49.99% of the shares of CENG.

This put option was exercisable by EDF from 1 January 2016 to 30 June 2022. The sale price for the CENG shares will be based on their fair value, determined under the contractual provisions of the put option agreement.

This sale of the CENG shares is part of the disposal plan concerning non-core assets announced by Group.

Although completion of this operation is conditional on obtaining the required regulatory approvals and will take several months, in view of the terms of the contractual agreements, the Group is engaged in an irrevocable process. Authorisation was received from the FERC (Federal Energy Regulatory Commission) on 30 July 2020.

The sale process is still ongoing at 31 December 2020. Valuations were exchanged in the second half of 2020 but no final price has yet been agreed by the parties. At this stage, the Group's valuation for the put option does not indicate any significant risk of additional impairment.

The decrease in assets held for sale and related liabilities is explained by:

- the sale of Edison's E&P operations (excluding the Algerian and Norwegian operations) in December 2020 (see note 1.4.2) which represented assets of €1,129 million and liabilities of €910 million at 31 December 2020;
- reclassification of the Algerian E&P assets and liabilities as continuing operations, which represented assets of €84 million and liabilities of €5 million at 30 June 2020.

3.2.2 Net income of discontinued operations

The line "Net income of discontinued operations" comprises Edison's E&P operations (excluding the Algerian and Norwegian operations), and impairment recognised in respect of these assets.

The principal profit and loss indicators for the E&P operations (excluding the Algerian and Norwegian operations) in 2019 and 2020 are as follows:

(in millions of euros)	2020	2019 [(1)]
Sales	216	377
Operating profit before depreciation and amortisation	86	237
Operating profit	13	125
Financial result	(22)	(22)
Income taxes	(32)	(87)
NET INCOME	**(41)**	**16**
Impairment of discontinued operations, net of income taxes [(2)]	(117)	(513)
NET INCOME OF DISCONTINUED OPERATIONS	**(158)**	**(497)**

(1) The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).

(2) The total amount of impairment recorded in 2019 on E&P operations remains allocated to discontinued activities, as it is not possible from the terms of the initial agreement to determine impairment in 2019 asset by asset.

3.3 Scope of consolidation at 31 December 2020

The Group's business sectors are defined as follows:

- **"Generation/Supply" (G):** generation of nuclear energy, thermal energy, and renewable energies (wind, photovoltaic and hydro) and energy sales to industry, local authorities, small businesses and private customers. This segment also includes trading activities;
- **"Distribution" (D):** management of the low and medium-voltage public electricity distribution networks;
- **"Transmission" (T):** operation, maintenance and development of the high-voltage and very-high-voltage electricity transmission networks;
- **"Reactors and Services (Framatome)" (R):** services and production of equipment and fuel for nuclear reactors;
- **"Services and other activities" (O):** energy services (district heating, thermal energy services, etc.) for industry and local authorities. This activity also includes EDF Invest's holding companies and entities that are classified as dedicated assets.

The companies and subgroups included in the EDF group consolidation are listed below.

(1) EDF Press Release of 1 April 2014 "EDF and Exelon finalize agreement on CENG".

3.3.1 Fully consolidated companies

		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
FRANCE – GENERATION AND SUPPLY				
Électricité de France – Parent Company		100.00	100.00	G, D, O
Group Support Services (G2S)		100.00	100.00	O
Edvance		95.10	95.10	O
Cyclife		100.00	100.00	O
CHAM SAS		100.00	100.00	O
Sowee		100.00	100.00	O
IZI Solutions		100.00	100.00	O
IZIVIA		100.00	-	O
EDF Pulse Croissance		100.00	-	O
Agregio		100.00	-	O
Energy2Market (E2M)		100.00	-	O
EDF ENR (formerly ENRS)		100.00	100.00	O
Immo C47		51.00	51.00	O
Other holding companies (EDF Invest)		100.00	100.00	O
FRANCE – REGULATED ACTIVITIES				
Enedis		100.00	100.00	D
Électricité de Strasbourg		88.64	88.64	G, D
EDF Production Électrique Insulaire (EDF PEI)		100.00	100.00	G
FRAMATOME				
Framatome	France	75.50	75.50	R
UNITED KINGDOM				
EDF Energy Holdings Limited (EDF Energy)		100.00	100.00	G, O
EDF Energy UK Ltd.		100.00	100.00	O
EDF Development Company Ltd.		100.00	100.00	O
ITALY				
Edison SpA (Edison)		97.45	97.45	G, O
Transalpina di Energia SpA (TdE SpA)		100.00	100.00	O
OTHER INTERNATIONAL				
EDF International SAS	France	100.00	100.00	O
EDF Belgium SA	Belgium	100.00	100.00	G
Luminus SA	Belgium	68.63	68.63	G, O
EDF Norte Fluminense SA	Brazil	100.00	100.00	G
French Investment Guangxi Laibin Electric Power Co., Ltd. (Figlec)	China	100.00	100.00	G
EDF (China) Holding Ltd.	China	100.00	100.00	O
EDF Inc.	USA	100.00	100.00	O
EDF Alpes Investissements SARL	Switzerland	100.00	100.00	O
Mekong Energy Company Ltd. (MECO)	Vietnam	56.25	56.25	G
EDF Andes Spa	Chile	100.00	100.00	G

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
EDF RENEWABLES				
EDF Renewables	France	100.00	100.00	G, O
DALKIA				
Dalkia	France	99.94	99.94	O
OTHER ACTIVITIES				
EDF Développement Environment SA	France	100.00	100.00	O
EDF IMMO and real estate subsidiaries	France	100.00	100.00	O
Société C3	France	100.00	100.00	O
EDF Holding SAS	France	100.00	100.00	O
Citelum	France	100.00	100.00	O
EDF Trading Ltd.	United Kingdom	100.00	100.00	G
Wagram Insurance Company DAC	Ireland	100.00	100.00	O
EDF Investissements Groupe SA	Belgium	92.46	93.89	O
Océane Re	Luxembourg	99.98	99.98	O
EDF Gas Deutschland GmbH	Germany	100.00	100.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.2 Joint operations

Other activities		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
Friedeburger Speicherbetriebsgesellschaft GmbH (Crystal)	Germany	50.00	50.00	O

Business sectors: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

3.3.3 Companies accounted for by the equity method

		Percentage ownership at 31/12/2020	Percentage ownership at 31/12/2019	Business sector
FRANCE – GENERATION AND SUPPLY				
Domofinance	France	45.00	45.00	O
CTE (EDF Invest) *	France	50.10	50.10	O
Elisandra IV (Madrileña Red de Gas Holding) (EDF Invest)	Spain	20.00	20.00	O
AREPE Fund SCS (EDF Invest)	Luxembourg	21.99	24.66	O
Géosel Manosque (EDF Invest)	France	38.35	38.35	O
Transport Stockage Hydrocarbures (EDF Invest)	France	50.00	50.00	O
Central Sicaf (EDF Invest)	Italy	24.50	24.50	O
Thyssengas (EDF Invest)	Germany	50.00	50.00	O
Aéroports Côte d'Azur (EDF Invest)	France	19.40	19.40	O
Ecowest (EDF Invest)	France	50.00	50.00	O
Fallago Rig (EDF Invest)	United Kingdom	20.00	20.00	G
Fenland Wind Farm (EDF Invest)	United Kingdom	20.00	20.00	G
Catalinar Solar (EDF Invest)	USA	50.00	50.00	G
Switch (EDF Invest)	USA	50.00	50.00	G
MiRose (EDF Invest)	USA	50.00	50.00	G
Red Pine (EDF Invest)	USA	50.00	50.00	G
Energy Assets Groupe (EDF Invest)	United Kingdom	40.00	-	O
Valentine Solar (EDF Invest)	USA	50.00	-	G
Glacier's Edge (EDF Invest)	USA	50.00	-	G
Nicolas Riou (EDF Invest)	Canada	50.00	-	G
Arada (EDF Invest)	Portugal	30.00	-	G
Cabreira (EDF Invest)	Portugal	30.00	-	G
Montemuro (EDF Invest)	Portugal	30.00	-	G
Korian & Partenaires Immobilier 1 & 2 (EDF Invest)	France	24.50	-	O
OTHER INTERNATIONAL				
Compagnie Énergétique de Sinop (CES)	Brazil	51.00	51.00	G
Constellation Energy Nuclear Group LLC (CENG)	USA	49.99	49.99	G
SLOE Centrale Holding BV	Netherlands	50.00	50.00	G
Shandong Zhonghua Power Company, Ltd.	China	19.60	19.60	G
Datang Sanmenxia Power Generation Co., Ltd.	China	35.00	35.00	G
Taishan Nuclear Power Joint Venture Company Ltd. (TNPJVC)	China	30.00	30.00	G
Jiangxi Datang International Fuzhou Power Generation Company Ltd.	China	49.00	49.00	G
Nam Theun 2 Power Company (NTPC) (EDF Invest)	Laos	40.00	40.00	G
Generadora Metropolitan (GM)	Chile	50.00	50.00	G
Nachtigal Hydro Power Company	Cameroon	40.00	40.00	G

Business segments: G = Generation, D = Distribution, T = Transmission, R = Reactors, O = Other.

* *Coentreprise de Transport d'Électricité or CTE, the company holding 100% of RTE.*

3.3.4 Companies in which the EDF group's voting rights differ from its percentage ownership

The percentage of voting rights, which is decisive for assessing control, differs from the Group's percentage ownership for the following entities:

	Percentage ownership at 31/12/2020	Percentage of voting rights held at 31/12/2020
Edison SpA	97.45	99.48
EDF Investissements Groupe SA	92.46	50.00

Note 4 Segment reporting

4.1 Reporting by operating segment

Accounting principles and methods

Segment reporting presentation complies with IFRS 8 "Operating segments".

Segment reporting is presented before inter-segment eliminations. Inter-segment transactions take place at market prices.

In accordance with IFRS 8, the breakdown used by the EDF group corresponds to the operating segments as regularly reviewed by the Management Committee (the Group's chief operating decision-maker).

The Group's segments are:

- "**France – Generation and Supply**": EDF SA's energy production and sales activities. This segment also includes entities operating on the downstream sectors (B2B and B2C, aggregation) and all EDF Invest's shareholdings;
- "**France – Regulated activities**": Enedis and Électricité de Strasbourg's distribution activities, and EDF's island activities;
- "**Framatome**": the entities of the Framatome subgroup;
- "**United Kingdom**": the entities of the EDF Energy subgroup;
- "**Italy**": Edison entities and TdE SpA;
- "**Other international**": EDF International and the entities located in continental Europe, the US, Latin America and Asia;
- "**EDF Renewables**": the entities of the EDF Renewables subgroup;
- "**Dalkia**": the entities of the Dalkia subgroup;
- "**Other activities**": comprising in particular EDF Trading and EDF Investissements Groupe.

No segments have been merged.

4.1.1 At 31 December 2020

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy	Other international	EDF Renewables	Dalkia	Other activities [5]	Inter-segment eliminations	Total
Income statement:											
External sales	27,112	16,178	1,900	9,041	5,937	2,242	1,069	3,729	1,823	-	**69,031**
Inter-segment sales	1,249	50	1,395	-	30	178	513	483	304	(4,202)	**-**
TOTAL SALES	**28,361**	**16,228**	**3,295**	**9,041**	**5,967**	**2,420**	**1,582**	**4,212**	**2,127**	**(4,202)**	**69,031**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**7,412**	**5,206**	**534**	**823**	**683**	**380**	**848**	**290**	**261**	**(263)**	**16,174**
OPERATING PROFIT	**2,270**	**1,893**	**269**	**(947)**	**134**	**98**	**354**	**(32)**	**99**	**(263)**	**3,875**
Balance sheet:											
Goodwill	109	223	1,332	7,569	98	37	183	572	142	-	**10,265**
Intangible assets and property, plant and equipment	60,773	65,383	2,603	20,537	5,286	2,127	9,782	2,255	647	-	**169,393**
Investments in associates and joint ventures [1]	2,859	-	65	119	156	1,991	1,197	75	332	-	**6,794**
Financial assets and cash [2]	52,134	339	263	14,833	400	654	1,727	170	6,897	-	**77,417**
Other segment assets [3]	19,901	5,608	1,763	4,772	1,661	662	866	1,919	2,574	-	**39,726**
Assets classified as held for sale	-	-	-	-	485	1,811	-	-	-	-	**2,296**
TOTAL ASSETS	**135,776**	**71,553**	**6,026**	**47,830**	**8,086**	**7,282**	**13,755**	**4,991**	**10,592**	**-**	**305,891**
Other information:											
Net depreciation and amortisation [4]	(4,613)	(3,314)	(276)	(1,122)	(417)	(284)	(458)	(278)	(76)	-	**(10,838)**
Impairment	(16)	-	-	(638)	(74)	-	(36)	(34)	(1)	-	**(799)**
Equity (non-controlling interests)	118	38	115	7,090	178	423	828	284	519	-	**9,593**
Investments in intangible assets and property, plant and equipment	5,503	4,187	215	3,485	492	191	1,650	257	27	-	**16,007**
Loans and other financial liabilities	67,534	2,335	288	5,311	1,737	11,564	6,537	1,695	264	(31,674)	**65,591**
● *external liabilities*	*60,181*	*761*	*198*	*225*	*823*	*96*	*2,792*	*312*	*203*	-	***65,591***
● *intersegment liabilities* [6]	*7,353*	*1,574*	*90*	*5,087*	*913*	*11,468*	*3,747*	*1,380*	*62*	*(31,674)*	**-**

(1) At 31 December 2020, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

(2) Financial assets and cash mainly comprise dedicated assets amounting to €28,398 million in the France – Generation and Supply segment (see note 18.1.2) and the NLF receivable (see note 18.1.3) amounting to €13,034 million in the United Kingdom segment.

(3) Other segment assets include inventories, trade receivables, other receivables and tax assets. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €1,993 million (see note 13.3.4).

(4) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

(5) Sales by the "Other activities" segment include the €912 million trading margin realised by EDF Trading.

(6) The amount of intersegment liabilities corresponds to the Group's centralised cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment) and EDF Energy (United Kingdom segment).

4.1.2 At 31 December 2019

(in millions of euros)	France – Generation and Supply	France – Regulated activities	Framatome	United Kingdom	Italy [5]	Other international	EDF Renewables	Dalkia	Other activities [6]	Inter-segment eliminations	Total
Income statement:											
External sales	26,658	16,072	1,895	9,570	7,565	2,507	1,043	3,732	2,305	-	**71,347**
Inter-segment sales	1,212	15	1,482	4	32	183	522	549	423	(4,422)	**-**
TOTAL SALES	**27,870**	**16,087**	**3,377**	**9,574**	**7,597**	**2,690**	**1,565**	**4,281**	**2,728**	**(4,422)**	**71,347**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION	**7,615**	**5,101**	**527**	**772**	**593**	**339**	**1,193**	**349**	**505**	**(271)**	**16,723**
OPERATING PROFIT	**3,483**	**1,892**	**230**	**(349)**	**69**	**42**	**670**	**(18)**	**1,009**	**(271)**	**6,757**
Balance sheet:											
Goodwill	72	223	1,341	7,965	103	33	199	544	143	-	**10,623**
Intangible assets and property, plant and equipment	58,275	63,499	2,591	19,034	5,410	2,226	9,773	2,288	626	-	**163,722**
Investments in associates and joint ventures [1]	2,593	-	90	127	104	2,058	1,063	75	304	-	**6,414**
Financial assets and cash [2]	51,246	407	276	14,693	485	533	1,351	260	10,303	-	**79,554**
Other segment assets [3]	18,526	5,233	2,132	5,352	1,678	790	861	2,001	2,736	-	**39,309**
Assets classified as held for sale	-	-	-	-	1,737	1,925	-	-	-	-	**3,662**
TOTAL ASSETS	**130,712**	**69,362**	**6,430**	**47,171**	**9,517**	**7,565**	**13,247**	**5,168**	**14,112**	**-**	**303,284**
Other information:											
Net depreciation and amortisation [4]	(4,047)	(3,200)	(263)	(1,009)	(427)	(269)	(474)	(259)	(72)	-	**(10,020)**
Impairment	(29)	-	(10)	(127)	(60)	-	(49)	(105)	(23)	-	**(403)**
Equity (non-controlling interests)	117	42	163	6,622	262	398	922	279	519	-	**9,324**
Investments in intangible assets and property, plant and equipment	6,091	4,610	210	3,352	376	227	1,608	275	48	-	**16,797**
Loans and other financial liabilities	68,192	2,002	342	5,323	1,723	8,315	5,746	1,691	210	(26,164)	**67,380**
● *external liabilities*	*62,121*	*783*	*233*	*224*	*762*	*93*	*2,695*	*340*	*129*	-	***67,380***
● *intersegment liabilities [7]*	*6,071*	*1,219*	*109*	*5,098*	*961*	*8,221*	*3,052*	*1,351*	*81*	*(26,164)*	**-**

(1) At 31 December 2019, investments in associates and joint ventures include 50.1% of CTE (the joint venture holding RTE's shares) which is part of the France – Generation and Supply segment.

(2) Financial assets and cash mainly comprise dedicated assets amounting to €26,018 million in the France – Generation and Supply segment (see note 18.1.2) and the NLF receivable (see note 18.1.3) amounting to €13,303 million in the United Kingdom segment.

(3) Other segment assets include inventories, trade receivables, other receivables and tax assets. By convention, the CSPE receivable is totally allocated to the France-Regulated Activities segment, in the amount of €1,667 million (see note 13.3.4).

(4) Including net increases in provisions for renewal of property, plant and equipment operated under concessions.

(5) The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).

(6) Sales by the "Other activities" segment include the €1,026 million trading margin realised by EDF Trading.

(7) The amount of intersegment liabilities corresponds to the Group's central cash management (cash pooling by EDF SA, included in the France – Generation and Supply segment) and financing of controlled subsidiaries, particularly EDF International (Other international segment) and EDF Energy (United Kingdom segment).

4.2 Sales to external customers, by product and service group

The Group's sales are broken down by product and service group as follows:

- **"Generation/Supply":** energy generation and energy sales to industry, local authorities, small businesses and residential consumers. This segment also includes EDF Trading;
- **"Distribution":** management of the low and medium-voltage public electricity distribution networks;
- **"Other":** services and production of equipment and fuel for reactors, energy services (district heating, thermal energy services, etc.) for industry and local authorities, and electricity generation through cogeneration and renewable energy sources (*e.g.* wind turbines, photovoltaic panels, etc.).

(in millions of euros)	Generation – Supply	Distribution	Other [1]	Total
2020:				
External sales:				
● France [2]	27,261	15,731	298	**43,290**
● International and Other activities	18,601	-	7,140	**25,741**
SALES	**45,862**	**15,731**	**7,438**	**69,031**

(in millions of euros)	Generation – Supply	Distribution	Other [1]	Total
2019:				
External sales:				
● France [2]	26,834	15,607	289	**42,730**
● International and Other activities [3]	21,884	-	6,733	**28,617**
SALES	**48,718**	**15,607**	**7,022**	**71,347**

(1) "Other" groups of services include Framatome, which was acquired on 31 December 2017.
(2) France comprises the two operating segments France – Generation and Supply and France – Regulated activities (see note 4.1).
(3) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations.

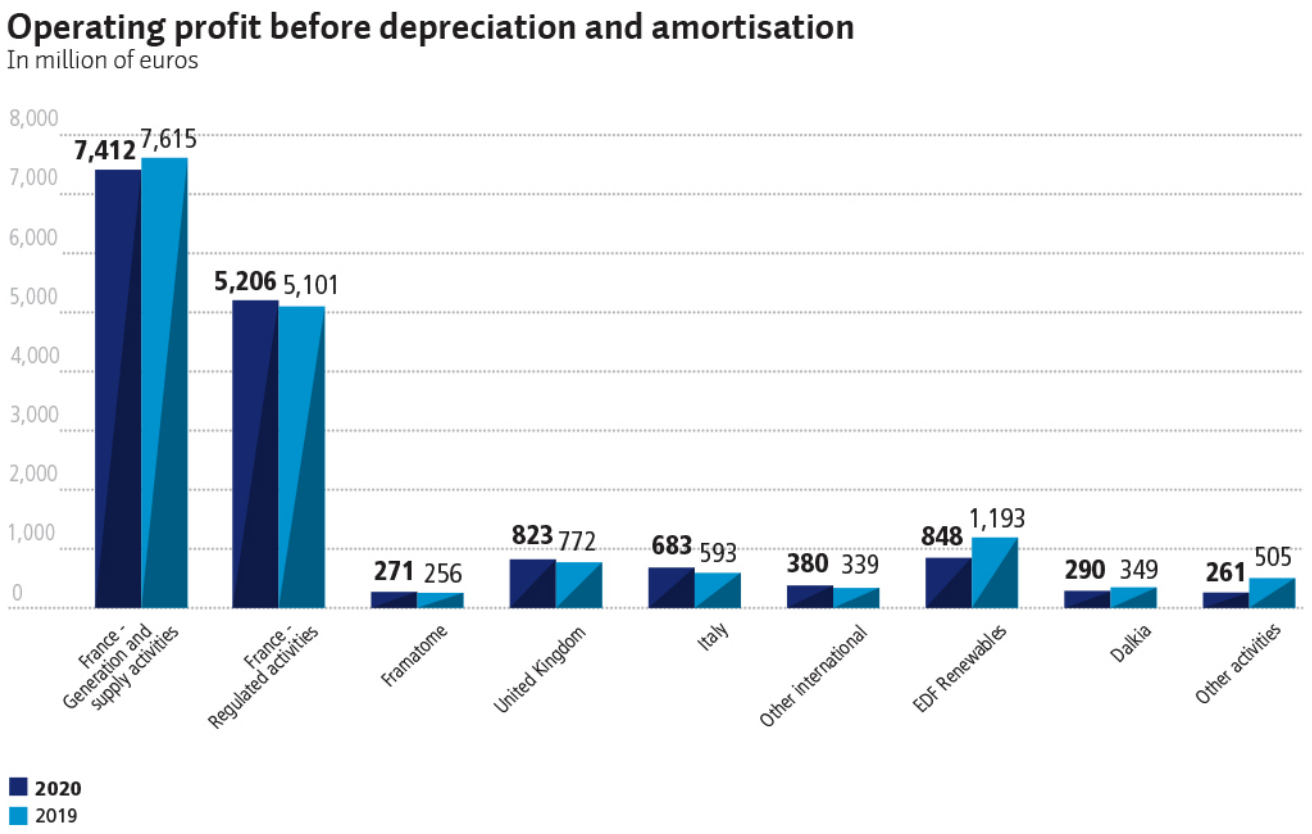
Note 5 Operating profit before depreciation and amortisation

(in millions of euros)	*Notes*	2020	2019 [1]
Sales	***5.1***	**69,031**	**71,347**
Fuel and energy purchases	***5.2***	**(32,425)**	**(35,091)**
External services		(13,072)	(13,142)
Other purchases (excluding external services, fuel and energy)		(3,524)	(3,598)
Change in inventories and capitalised production		7,888	7,932
(Increase)/decrease in provisions on other external expenses		247	183
Other external expenses [2]		**(8,461)**	**(8,625)**
Personnel expenses	***5.3***	**(13,957)**	**(13,797)**
Payroll taxes		(292)	(250)
Energy taxes		(1,635)	(1,674)
Other non-income taxes [3]		(1,870)	(1,874)
Taxes other than income taxes		**(3,797)**	**(3,798)**
Other operating income and expenses	***5.4***	**5,783**	**6,687**
OPERATING PROFIT BEFORE DEPRECIATION AND AMORTISATION		**16,174**	**16,723**

(1) The published figures for 2019 have been restated due to the impact of the change in the scope of E&P operations (see note 1.4.2).
(2) After elimination of the effect of changes in foreign exchange rates and the scope of consolidation, other external expenses decreased by 2.8% compared to 2019.
(3) Taxes other than income taxes mainly concern France and essentially comprise land tax and the French business taxes on land and value added. After elimination of changes in foreign exchange rates and scope of consolidation, other non income taxes increased by 1.3% compared to 2019.

The Group's consolidated operating profit before depreciation and amortisation for 2020 amounts to €16,174 million, a decrease of 3.3% from 2019.

The breakdown of the Group's Operating profit before depreciation and amortisation by operating segment in 2020 and 2019 is as follows, in millions of euros (see note 4.1):



After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's operating profit before depreciation and amortisation showed an organic decline of -2.7% or €(450) million. This decrease is principally attributable to the France – Generation and Supply segment (-2.7% or €(203) million), EDF Renewables (-23.0% or €(274) million), Other activities (-44.8% or €(226) million) and France – Regulated activities (+2.1% or +€105 million).

The €(450) million decrease in operating profit before depreciation and amortisation in the France – Generation and Supply segment is essentially explained by the effects of the Covid-19 pandemic, estimated at €(0.9) billion, particularly due to lower nuclear power output combined with a decline in consumption. The other effects relating to lower plant availability, including the closure of Fessenheim, were offset by positive energy price effects (including tariff increases – see note 5.1.1) and higher capacity market revenue (see note 5.1).

Operating profit before depreciation and amortisation for the France – Regulated activities segment increased by €105 million despite the €(0.2) billion effects of the Covid-19 pandemic (lower volumes delivered and connection services) and mild weather, supported by changes in the TURPE 5 tariff indexation (see note 5.1.1).

Despite growth in generation activities, EDF Renewables' operating profit before depreciation and amortisation was down by €(274) million, mainly due to a lower volume of development and sales of structured assets (€(0.3) billion) following the sale of 50% of the offshore wind farm NnG in 2019.

The €76 million increase in operating profit before depreciation and amortisation in the United Kingdom segment is notably attributable to the positive effect of higher nuclear power prices, counterbalanced by the Covid-19 pandemic effects (€(0.2) billion) and lower levels of nuclear generation.

In the Other activities, the €(226) million decline in operating profit before depreciation and amortisation is due to the €(122) million effect in gas activities, principally reflecting an increase in provisions for onerous contracts and a €(82) million downturn at EDF Trading, which achieved a steady performance in 2020 after an excellent performance in 2019.

5.1 Sales

Accounting principles and methods

Sales essentially comprise income from energy sales (to final customers and as part of trading activities), delivery services related to use of the transmission and distribution network, and connection services. They also comprise income from other services and deliveries of goods, mainly engineering, operating and maintenance services, services related to energy sales, design, delivery and commissioning services for power plants or their major components.

Income on energy sales is recognised as deliveries are made to customers.

The quantities of energy supplied but not yet measured and billed are calculated using consumption statistics and selling price estimates, and are recognised in sales on that basis.

Some Group entities conduct optimisation operations on the wholesale gas and electricity markets, to balance supply and demand in compliance with the Group's risk management policy. The sales concerned are recorded net of purchases. When an entity has a net short position in euros, it is included in "energy sales". A net long position in euros is included in "fuel and energy purchases".

In accordance with the provisions of IFRS 15 on the principal/agent distinction, energy delivery services are recognised in sales upon delivery to the customer in the following two cases:

- when these services are not distinct from the energy supply service;
- when they are distinct from the energy supply service and the entity concerned is acting as a principal, notably because it bears the risk of execution of the service or is able to set the tariff for delivery to the final customer.

Income from connections to the French electricity network is recognised in sales at the date when the connection becomes operational.

The sales revenue from other services or deliveries of goods is recognised over time in the three following cases, based on a contractual analysis:

- when the customer simultaneously receives and consumes all the benefits generated as the service is performed by the Group (this is notably the case of operations and maintenance services);
- when the good or service to be supplied cannot be reallocated to another customer, and the Group is entitled to payment for the work done so far (this is notably the case of certain design, delivery and commissioning activities for power plants or major components designed specifically for a customer);
- when the service creates or enhances an asset (good or service) for which the customer acquires control as performance of the service progresses.

Trading activities

Sales revenues include the margin realised, essentially by EDF Trading, on energy market trading operations that fall within the scope of IFRS 9, which are recognised at fair value.

EDF Trading is the Group's trading entity. It operates on the markets on behalf of other Group entities and through trading activity for its own purposes or for non-Group entities, backed by the Group's industrial assets and within its assigned risk mandate.

EDF Trading trades on organised or OTC markets in derivatives such as futures, forwards, swaps and options.

EDF Trading undertakes purchase and sale operations on the wholesale markets in Europe and North America for:

- electricity and fuel (principally gas);
- CO_2 emission permits, weather derivatives and other environmental instruments;
- capacity guarantees for electricity production.

EDF Trading also operates in the unregulated North American markets as part of its energy supply activities.

LNG optimisation and trading activities are carried out through the investment in Jera Global Markets, a joint venture with Jera.

Capacity mechanism

Capacity mechanisms have been set up in France, the UK and Italy to ensure secure power supplies during peak periods.

French system: French law 2010-1488 of 7 December 2010 on the new organisation of the electricity market introduced an obligation in France to contribute to power supply security from January 2017.

Operators of electricity generation plants and load-shedding operators must have their capacities certified by RTE, and commit to a forecast level of availability for a given year of delivery. In return, they are awarded capacity certificates.

Meanwhile, electricity suppliers and purchasers of power to compensate for network losses (obligated actors) must have capacity certificates equivalent to consumption by their customers in peak periods. Suppliers pass on the cost of the capacity mechanism to final customers through their sale prices.

The system is completed by registers for capacity trading between actors. Capacity auctions are held several times a year.

The Group is concerned by both aspects of this system, as an operator of electricity plants (EDF SA, Dalkia, EDF Renewables), as an electricity supplier (EDF SA, Électricité de Strasbourg) and as a purchaser of power to compensate for network losses (Enedis and Électricité de Strasbourg).

In view of the Covid-19 pandemic's effects on electricity supply security for the winter 2020-2021, and to maximise the utility and efficiency of the capacity mechanism, RTE made exceptional adjustments to certain conditions and relaxed certain regulatory constraints for capacity operators willing to increase their availability (notably waiving higher balance adjustment fees and late certification fees).

RTE thus issued a summary of transparency information currently available on the capacity mechanism on 18 September 2020, to enable the actors to assess the supply-demand balance situation for capacity guarantees in the mechanism for the next few years.

RTE also organised two further balance adjustment sessions for 2020, and made changes to the 2021 Demand Response tenders to make it more attractive. The volumes offered and accepted doubled, and a bonus was added for capacities that could be offered as soon as November 2020.

2020 registered a significant increase in capacity prices for 2020 and subsequent years from the auction in June. This is mainly explained by the market actors anticipating lower fleet availability for peak periods, in the context of the Covid-19 crisis (see note 1.4.1).

The market reference prices for 2017, 2018, 2019 and 2020 were established respectively at €10.0/kW, €9.3/kW, €17.4/kW and €19.5/kW. Six auctions held in 2020 (March, April, June, September, October, December) for deliveries in 2021 resulted in the following prices, in chronological order: €19.5/kW, €19.2/kW, €47.4/kW, €29.5/kW, €32.7/kW, and €39.1/kW.

The delivery year 2022 was also opened to auction in 2020. The four capacity auctions held resulted in the following prices, in chronological order: €16.6/kW, €38.9/kW, €18.1/kW and €18.2/kW.

The operations are recorded as follows:

- sales of certificates are recognised in income when the auctions or over-the-counter sales take place;
- the cost of the capacity mechanism passed on to final customers through regulated sales tariffs and market-price offers is recognised in sales revenues as and when the electricity is delivered. In addition, the ARENH price, although it has not changed since first set up, is considered to have included a capacity value since 1 January 2017 when the capacity mechanism took effect, as the terms of transfer for the capacity guarantees associated with the ARENH system were defined by the CRE;
- stocks of certificates are stated either at their certification value (*i.e.* cost of certification by RTE) or at their purchase value on the markets;
- decreases in the stock of certificates are valued at the weighted average unit cost. The timing of recognition depends on the actor:
  - operators of installations: when the auction sales take place,
  - obligated actors: spread on a straight-line basis over the 5-month peak period;
- for operators of installations, if the effective capacity is lower than the certified capacity, a liability (accrued expenses or provision) is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation (rebalancing or settlement mechanism);
- for obligated actors, if there is a shortfall in the stocks of capacity certificates, a provision is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation;
- at the closing date, if the realisable value of the stock of capacity certificates is lower than its net book value, impairment is recognised.

British system: The British capacity mechanism was introduced in 2014 to ensure security of electricity supply by providing a payment for reliable sources of capacity, alongside their electricity revenues, to ensure they deliver energy when needed. It is based on a system of auctions for operators, organised by the network operator "National Grid" to procure capacity 4 years ahead of delivery; delivery years run from 1 October to 30 September. Capacity operators which have been successful at the auctions are remunerated in the year of delivery out of a fund consisting of contributions from electricity suppliers.

The electricity suppliers' contribution to this mechanism is proportional to their sales to customers in the peak period and the cost of capacity is passed on to final customers through their sale price.

EDF Energy is concerned by both aspects of this system, as an operator of electricity plants and a supplier.

For accounting purposes, the remuneration received in its capacity as an operator is recognised in sales revenues in the year of delivery, and the contribution paid to the mechanism in its capacity as an electricity supplier is recognised in energy purchases over the peak period. The cost of the capacity mechanism passed on to final customers is recognised in sales revenues as and when the electricity is delivered.

On 15 November 2018, the UK's Capacity Market was suspended after a ruling by the European Court of Justice concluding that it did not comply with EU rules on state aid. No capacity market revenues were thus recognised for the suspension period in 2018.

On 24 October 2019, following an in-depth investigation, the European Commission reapproved the UK capacity market scheme under EU State aid rules. The decision enabled payments that had been suspended since November 2018 to be made. Suppliers were required to make back-payments of the capacity supplier charge in 2019 and capacity providers have recognised revenue for the whole suspension period with cash received in January and February 2020.

Italian system: A capacity mechanism was set up in 2019 using rules approved in a decree of 28 June 2019 issued by the Economic Development Ministry.

This mechanism is based on an auction process organised by TERNA, the Italian transmission grid operator, for each delivery year. Operators of existing and future production or storage units can participate in the auctions. The operators of the capacities selected are paid through a fixed premium during one year for existing capacities and 15 years for future capacities. The fixed premium is paid during the delivery year.

The selected operator must offer its capacity on the day-ahead market (*Mercato del Giorno Prima*) and the balancing market (*Mercato per il Servizio di Dispacciamento*). If the selling price on these markets reaches a level exceeding a strike price defined by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA), the operator must repay the surplus to TERNA.

Two auctions were held during 2019 for delivery dates set in 2022 and 2023, and Edison won 3.8GW for 2022 and 3.3GW for 2023 for an annual price of €75,000/MW for new capacities and €33,000/MW for existing capacities. Edison did not participate in any auction in 2020.

The fixed premium is recorded in income during the corresponding delivery year, and reduced if appropriate by any repayments made to TERNA, or if the power plant is unavailable.

5.1.1 Regulatory changes in France

Regulated electricity sales tariffs in France – "Blue" tariffs

In accordance with Article L. 337-4 of the French Energy Code, regulated electricity sales tariffs are set by the Ministers for Energy and the Economy following proposals by the French Energy Regulatory Commission (Commission de régulation de l'énergie or CRE).

France's Council of State ruled in decisions of 18 May and 3 October 2018 that the principle of regulated electricity sales tariffs is compatible with European Union law when such tariffs serve the general economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices.

In accordance with European Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity, the French Energy and Climate law of 8 November 2019 authorises continuation of regulated sales tariffs, but they are reserved for residential or business consumers with a subscribed power level of up to 36kVA, provided they have fewer than 10 employees and their annual sales, income or balance sheet total is below €2 million.

France's Energy and Climate law, which sets out the terms of the partial discontinuation of regulated sales tariffs for non-residential customers, and the associated implementing decisions, are presented in note 4 to the consolidated financial statements at 31 December 2019.

2020 was marked by implementation of laws, particularly regarding:

- identification of customers' eligibility or non-eligibility for regulated sales tariffs;
- making data available to other suppliers; and
- informing non-eligible customers of the termination date of their regulated-tariff contract and the need to subscribe a market-rate contract taking effect no later than 1 January 2021 with the supplier of their choice. Customers failing to do so accept automatically to switch to a market-rate contract validated by the CRE with their current supplier.

Tariff changes

In accordance with the Article L. 337-4 of the French Energy Code, the CRE is responsible for sending the Ministers for the Economy and Energy its reasoned proposals for regulated sales tariffs for electricity. If no objections are made within three months, the proposals are deemed to have been approved.

In a decision of 16 January 2020, the CRE proposed an increase of 2.4% (including taxes) in the "blue" tariffs for residential and non-residential customers (3.0% excluding taxes for residential customers and 3.1% excluding taxes for non-residential customers). This proposed increase takes account of the rise in prices on the wholesale energy markets, the level of ARENH curtailments for 2020, higher selling costs including the costs of purchasing energy savings certificates, and the adjustments made to narrow the gap between costs and revenues observed on regulated electricity sales tariffs during 2019. This CRE proposal was confirmed by tariff decisions of 29 January 2020 that were published in the *Journal officiel* of 31 January 2020, and applied from 1 February 2020.

In a decision of 2 July 2020, in view of changes in the TURPE network access tariffs applicable from 1 August 2020 and in application of the Energy Code, the CRE proposed an increase of 1.54% including taxes (1.82% excluding taxes) in the "blue" tariffs for residential customers and 1.58% including taxes (1.81% excluding taxes) in the "blue" tariffs for non-residential customers. This CRE proposal was confirmed by a tariff decision of 29 July 2020 that was published in the *Journal officiel* of 31 July 2020, and applied from 1 August 2020.

In a decision of 14 January 2021, the CRE proposed an increase of 1.61% including taxes (1.93% excluding taxes) in the "blue" tariffs for residential customers and 2.61% including taxes (3.23% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2021. This proposed increase takes particular account of the rising cost of energy supplies and capacity guarantees, the "catch-up" adjustment to cover the cost-income differential on regulated sales tariffs in 2019 and 2020, movements in selling costs associated with unpaid receivable forecasts for 2021, particularly in the context of the Covid-19 pandemic, and adjustment of selling costs for non-residential customers who are still eligible for the regulated tariffs. This CRE proposal was confirmed by tariff decisions of 28 January 2021 that were published in the *Journal officiel* of 31 January 2021, and has applied since 1 February 2021.

"TURPE" Network access tariffs

The costs borne by the network operators Enedis and RTE for management of the public electricity transmission and distribution networks are covered by the "TURPE" tariffs for using the networks, as stipulated in Articles L. 341-2 and following of the French Energy Code.

These tariffs apply to users connected to the distribution and transmission networks.

The TURPE tariffs are approved by the Ministry for the Ecological Transition following reasoned proposals submitted by the CRE.

On 17 November 2016, the CRE published its decisions for the TURPE 5 Transmission (high voltage) and TURPE 5 Distribution (medium voltage and low voltage) tariffs for the period from 1 August 2017 to 31 July 2021.

On 28 June 2018, the CRE adopted a decision regarding the TURPE 5 HTA-BT (medium voltage – low voltage) tariff and the new version of that tariff from 1 August 2018, known as the "second TURPE 5 HTA-BT". Among other things, this decision reflected implementation of the Council of State's partial cancellation decision of 9 March 2018. This decision had no impact on the tariff preparation method, the operating expense trajectory, the principle of regulation for incentive purposes, or the regulations applicable to Linky meters.

The CRE published two decisions on the TURPE 6 Transmission (high voltage) and TURPE 6 Distribution (medium voltage – low voltage) on 21 January 2021, after the Higher Energy Council (Conseil supérieur de l'énergie) gave its approval. These tariffs will apply from 1 August 2021 to 31 July 2025.

TURPE 5 Transmission tariffs

On 6 June 2019 the CRE adopted a decision concerning the TURPE 5 tariff for the high voltage network and its revision at 1 August 2019. The tariff scale increased by an average 2.16% from 1 August 2019, comprising +1.61% for inflation and +0.55% to balance the income and expenses adjustment account (CRCP [(1)]).

On 14 May 2020, the CRE adopted a decision reducing the TURPE 5 tariff for the high voltage network by -1.08% from 1 August 2020, comprising +0.92% for inflation, and -2% to balance the CRCP.

TURPE 6 Transmission tariffs

In decision n°2021-12 of 21 January 2021, the CRE set a nominal pre-tax weighted average cost of capital (WACC) of 4.6% for the return on RTE's asset base, compared to 6.125% for TURPE 5. The average tariff increase will be +1.09% at 1 August 2021 and an average +1.57% per year for the whole tariff period, assuming average annual inflation of 1.07% over that period. The CRE's decision on the TURPE 6 Transmission tariff was published on 21 January 2021.

Second TURPE 5 Distribution tariffs

On 25 June 2019 the CRE adopted a decision concerning revision of the TURPE 5 tariff for the medium and low voltage network at 1 August 2019. The tariff scale increased by an average +3.04% from 1 August 2019, comprising +1.61% for inflation, +1.45% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

By a decision of 20 May 2020, the CRE adopted a +2.75% increase to the second TURPE 5 tariff for the medium and low voltage network from 1 August 2020. This increase comprises +0.92% for inflation, +1.85% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

TURPE 6 Distribution tariffs

In decision n°2021-13 of 21 January 2021, the CRE asset the margin on assets at 2.5% (unchanged from the Second TURPE 5) and the additional return on regulated equity at 2.3% (compared to 4% for the Second TURPE 5, principally as a result of the lower market rates and lower corporate income tax rates). The average tariff increase will be +0.91% at 1 August 2021 and +1.39% per year for the whole tariff period, assuming average annual inflation of 1.07% over that period. The CRE's decision on the TURPE 6 Distribution tariff was published on 21 January 2021.

Supplier commissioning

After Law 2017-1839 of 30 December 2017 confirmed the CRE's competence for supplier commissioning, the CRE issued a decision on 18 January 2018 reiterating the principles adopted in its previous decision of 26 October 2017 regarding remuneration payable by distribution network operators to suppliers for the service of managing single-contract customers on their behalf.

This decision upheld the principle of identical commissions for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs were to give rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), with progressive reduction of this difference to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision set an amount it considered as a cap that can be passed on through the TURPE tariff.

However, Law 2017-1839 of 30 December 2017 introduced a measure intended to rule out the possibility of suppliers receiving remuneration from network managers for past customer management services. On 23 December 2016, ENGIE brought an action against Enedis before the Paris Commercial Court claiming such remuneration. In the course of this litigation, ENGIE filed an application for a preliminary ruling on constitutionality concerning the arrangements introduced by the French "Hydrocarbons" law which ended the possibility of obtaining supplier commissioning for past services. These arrangements were validated by the Constitutional Council in its decision 2019-776 of 19 April 2019. The proceedings at the Paris Commercial Court are still ongoing.

Electricity Equalisation Fund

The TURPE tariff for the medium and low-voltage network is identical for every electricity network operator. It is determined on the basis of forecast expenses to be borne by Enedis, provided they correspond to an efficient network operator, and forecasts of the number of consumers connected to Enedis' networks, their consumption, and the power level subscribed.

As this tariff cannot always cover the specific needs of certain service zones, the Electricity Equalisation Fund (FPE) exists to compensate for disparities in network operating conditions. The Energy Code requires electricity distribution costs resulting from public network operation to be shared between public distribution network operators. A normative formula for calculating the cost allocation is defined in a decree and a ministerial order and applies to all distribution network operators: in the EDF group, the entities concerned are Enedis, Électricité de Strasbourg and SEI.

(1) A mechanism to measure and offset main differences between the actual figures and the forecasts on which tariffs are based.

On 23 July 2020, the CRE published its decision setting the final amount of the allocation from the Electricity Equalisation Fund (*fonds de péréquation de l'électricité*) to SEI, Électricité de Mayotte and Gérédis, the three operators that opted for assessment based on the CRE's analysis of their accounts. SEI's allocation is set at €198.5 million for 2020.

The ministerial order of 22 October 2020 describes the contributions payable and allocations receivable from the Electricity Equalisation Fund for operators in the distribution network it covers for 2020. The fixed contributions due by Strasbourg Électricité Réseaux and Enedis amount to €2.5 million and €27.7 million respectively.

ARENH

The ARENH [(1)] scheme for regulated access to historic nuclear power, set up in 2011, entitles alternative suppliers to purchase electricity from EDF to supply their final customers, after signing a framework agreement, at a regulated price for set quantities determined under the provisions of the French Energy Code. This scheme is also open to network operators to cover their energy losses.

The ARENH price, determined by the Ministers for Energy and the Economy following a proposal by the CRE, has been maintained at €42/MWh since January 2012. This includes delivery of the electricity and is considered to incorporate the associated capacity guarantees.

The maximum total volume that can be sold under the ARENH system to suppliers who apply to the scheme to cover the needs of their final customers was initially set at 100TWh per year.

In decision 2020-277 of 12 November 2020, as required by the Energy Code, the CRE set out the method for allocating ARENH volumes if applications exceed the maximum total volume defined for 2021. This decision stipulated that if the ARENH was oversubscribed in November 2020, curtailment would only apply to new ARENH applications made in the session concerned.

It also stated that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to network operators) and they could enter into contracts with the parent company that replicate the ARENH system and terms of supply, particularly the curtailment rate for alternative suppliers. In the method proposed by the CRE in decision 2020-002 concerning regulated sales tariffs for electricity, this curtailment mechanism, when applied, makes reference to market prices more influential in determining regulated sales tariffs.

Decree 2020-1414 of 19 November 2020 modified the regulatory section of the Energy Code concerning the ARENH and CSPE mechanisms, setting out the method for allocating the ARENH price supplement paid between suppliers and EDF, and assigning to the CRE the task of defining the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached.

The same decree modified the measures applicable in the event of default on payment, stipulating that the purchaser concerned is banned from ARENH sales for a one-year period as soon as the electricity transfer is first stopped.

The Energy and Climate law of 8 November 2019 introduced new measures. It raised this initial 100TWh ceiling to 150TWh from 1 January 2020, allowing the French government to raise the maximum total volume of ARENH deliveries above 100TWh, and to revise the ARENH price by ministerial decision during a transition period. However, the Ministry for the Ecological and Inclusive Transition announced that no change would be made to the ARENH price or volume for 2021.

ARENH applications during the November 2020 session for delivery in 2021 totalled 146.2TWh (excluding applications from EDF subsidiaries). Since the maximum total volume has not been modified, the volume to be delivered totalled 100TWh and as in the previous year the CRE curtailed each supplier's application. Further volumes were also sold by EDF to its subsidiaries through contracts that replicate the ARENH mechanism, and to compensate for network losses (26.3TWh).

In the context of the Covid-19 pandemic, in decision 2020-071 of 26 March 2020 the CRE introduced measures in favour of suppliers with respect to the ARENH mechanism. These measures consisted of cancelling the "CP2 [(2)]" penalty for excessive ARENH applications for the year 2020, and deferring settlement of ARENH invoices upon request by the supplier, under the terms defined in ordinance 2020-316 of 25 March 2020 on settlement of invoices, as detailed in CRE decision 2020-076 of 9 April 2020.

EDF has also offered special payment terms to small suppliers in a fragile position. The application methods for these terms were established by CRE decision 2020-076 of 9 April 2020.

Litigation relating to the ARENH mechanism has also been instigated by some energy suppliers in the context of the Covid-19 pandemic. Details are provided in note 1.4.1.

In its decision 2020-315 of 17 December 2020, the CRE proposed changes to the ARENH master agreement model to incorporate the modifications introduced by decree 2020 -1414 and in decisions 2020 -277 of 12 November 2020 and 2020 - 285 of 2 December 2020, the CRE set out the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached.

(1) Accès Régulé à l'Énergie Nucléaire Historique.

(2) Penalties for excessive ARENH applications.

5.1.2 Sales

Sales are comprised of:

(in millions of euros)	2020	2019 [1]
Sales of energy and energy-related services	62,918	65,790
energy [2]	*43,767*	*46,620*
energy-related services (including delivery [3])	*19,151*	*19,170*
Other sales of goods and services	5,201	4,531
Trading	912	1,026
SALES	**69,031**	**71,347**

(1) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

(2) Sales of energy include €1,112 million of sales related to optimisation operations on the wholesale gas and electricity markets in 2020 (€1,548 million in 2019). These operations are carried out by certain Group entities to balance supply and demand, in compliance with the Group's risk management policy. In 2020, the principal operating segments with a net short position in euros on the markers are France – Generation and supply (gas), Italy (electricity) and the United Kingdom (electricity). In 2019, the segments were the same.

(3) Delivery services included in this item concern the distribution network operators Enedis, Électricité de Strasbourg and EDF SA for non-interconnected zones. However, delivery services concerning EDF Energy and Edison are included in Sales of energy, because those entities are classified as the principal under IFRS 15 for both supply and delivery. The delivery services by EDF Energy and Edison have no impact on net income because they are included in "Transmission and delivery expenses" in note 5.2.

After elimination of foreign exchange effects and changes in the scope of consolidation, the Group's sales decreased by 3.4% or €(2.4) billion including the €(2.3) billion effect of the Covid-19 pandemic. The segments mainly concerned by this decline in sales were Italy (-21.8% or €(1.6) billion), Other activities (-19.5% or €(0.4) billion), Dalkia (-8.9% or €(0.3) billion), and the United Kingdom (-1.9% or €(0.2) billion), while an increase was observed in the France – Generation and Supply segment (+0.6% or +€0.2 billion).

The €0.2 billion increase in sales by the France-Generation and Supply segment despite the €(1.1) billion effects of the Covic-19 pandemic is explained by energy price effects (including the increases in the regulated sales tariffs, see the paragraph above on regulated tariffs) and the higher capacity revenue (see the paragraph above on capacity mechanisms), partly offset by the lower nuclear power output excluding Covid-19 effects.

The rise in sales in the France-Regulated activities (+€0.1 billion) is more particularly attributable to changes in the TURPE 5 tariffs following the increases applied in 2020 (see the paragraph above on regulated tariffs) at a time when quantities delivered saw a significant downturn due to the very mild weather of 2020 and the effects of the Covid-19 pandemic (€(0.3) billion).

The lower level of sales by the Italy segment observed in 2020 (€(1.6) billion) is mainly explained by unfavourable price and volume effects on gas business estimated at €(1.5) billion, in line with falling prices across all markets, and also by mild weather and an unfavourable price effect in electricity business, estimated at €(0.2) billion.

The €(0.4) billion decrease in sales by the Other activities segment was essentially caused by LNG activities which were weakened by the significant decrease in wholesale prices and lower use of Group capacities.

Dalkia registered a €(0.3) billion decline in sales, against an unfavourable background of energy price movements and the Covid-19 pandemic (which had a €(0.2) billion on Dalkia's sales).

In the United Kingdom, sales were down by €(0.2) billion, principally due to the unfavourable effects of the Covid-19 pandemic (€(0.5) billion), lower nuclear power output and lower capacity revenue, despite the favourable effects of the higher realised sales prices for nuclear power.

5.2 Fuel and energy purchases

Fuel and energy purchases comprise:

(in millions of euros)	2020	2019 [1]
Fuel purchases used – power generation [2]	(10,162)	(11,700)
Energy purchases [2]	(14,645)	(15,041)
Transmission and delivery expenses	(7,916)	(8,325)
Gain/loss on hedge accounting	(22)	(7)
(Increase)/decrease in provisions related to nuclear fuels and energy purchases	320	(18)
FUEL AND ENERGY PURCHASES	**(32,425)**	**(35,091)**

(1) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

(2) Fuel purchases used and Energy purchases include respectively €514 million and €1,674 million for optimisation operations on the wholesale gas and electricity markets in 2020 (€417 million and €3,117 million in 2019). In 2020 the principal operating segments with net long positions in euros on the markets are France – Generation and Supply (electricity), the United Kingdom (gas), Other international (Luminus – gas and electricity) and Dalkia (gas). In 2019, the segments were the same.

Fuel purchases used include costs relating to raw materials for energy generation (nuclear fuels, fissile materials, gas, coal, oil and biomass), purchases of services related to the nuclear fuel cycle, and costs associated with environmental schemes (mainly greenhouse gas emission rights and renewable energy certificates).

"Energy purchases" include purchases made under the purchase obligation mechanism in France.

5.3 Personnel expenses

Personnel expenses comprise:

(in millions of euros)	2020	2019*
Wages and salaries	(9,024)	(8,914)
Social contributions	(2,020)	(1,951)
Employee profit sharing	(271)	(277)
Other contributions related to personnel	(347)	(360)
Other expenses linked to short-term benefits	(219)	(251)
Short-term benefits	**(11,881)**	**(11,753)**
Expenses under defined-contribution plans	(952)	(988)
Expenses under defined-benefit plans	(944)	(801)
Post-employment benefits	**(1,896)**	**(1,789)**
Other long-term expenses	(155)	(222)
Termination payments	(25)	(33)
Other personnel expenses	**(180)**	**(255)**
PERSONNEL EXPENSES	**(13,957)**	**(13,797)**

* *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

Excluding foreign exchange effects and changes in the scope of consolidation, personnel expenses increased by 1.1% from 2019, mainly in the France – Regulated activities, EDF Renewables segments and Dalkia.

Average workforce comprises:

	2020	2019
IEG status	95,530	96,818
Other	65,673	64,704
AVERAGE WORKFORCE	**161,203**	**161,522**

Average workforce numbers for the controlled entities and joint operations are reported on a full-time equivalent basis.
A more detailed presentation of workforce categories can be found in the "Environmental and Societal Information – Human Resources" section of the Universal Registration Document in section 3.4.2.1.1, "Workforce of the EDF group".

5.4 Other operating income and expenses

Other operating income and expenses comprise:

(in millions of euros)	*Notes*	2020	2019 (1)
Operating subsidies	*5.4.1*	8,305	7,834
Net income on deconsolidation	*5.4.2*	221	576
Gains on disposal of fixed assets	*5.4.2*	(229)	(188)
Net increase in provisions on current assets (2)		(203)	(107)
Net increase in provisions for operating contingencies and losses		(348)	(54)
Other items	*5.4.3*	(1,963)	(1,374)
OTHER OPERATING INCOME AND EXPENSES		**5,783**	**6,687**

(1) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).
(2) See the impairment of trade receivables as a result of the Covid-19 pandemic in note 1.4.1.2.

5.4.1 Operating subsidies

This item mainly comprises the subsidy received or receivable by EDF in respect of the compensation for public energy charges (CSPE), excluding the annual repayment of the past CSPE receivable and associated interest, reflected in the financial statements through recognition of income of €8,081 million for 2020 (€7,662 million for 2019). The operating receivable corresponding to the CSPE is recorded in other liabilities at 31 December 2020 (see note 13.3.4).

Compensation for public energy charges (CSPE) (France)

Mechanism

The compensation mechanism for public energy service charges (*compensation des charges de service public de l'énergie*) resulted from a reform introduced by France's amended finance law for 2015, published in the *Journal officiel* on 30 December 2015. Under the legislative and regulatory framework, the public energy service charges (electricity and gas) were to be compensated *via* two State budget items included in France's finance laws from 2016 onwards. The initial finance law for 2020 marked a continuation from 2019, defining the following measures for compensation of charges for 2020:

- a special "energy transition" budget item of €6.3 billion, principally to compensate for the additional costs associated with all contracts obliging the operators to purchase renewable energies and (to a much smaller degree) biogas, and covering the last annual contribution to repayment of the accumulated shortfall in compensation due to EDF;
- a "Public Energy Service" item of €2.7 billion in the general budget, notably to cover solidarity charges borne by gas and electricity suppliers, costs associated with purchase obligations excluding renewable energies (essentially cogeneration), and the cost of applying the standard national tariffs to zones that are not connected to France's mainland network. The interest on the accumulated shortfall to be repaid to EDF is also funded through the general budget.

From 1 January 2018, the "basic necessity" rates for electricity and the "special solidarity" rates for gas were replaced by an energy voucher system. The cost of this system is not borne by EDF, but budgeted by the State in the "Public Energy Service" programme. EDF has borne solidarity charges for the national housing solidarity fund and services for vulnerable customers in both 2019 and 2020.

In 2020, this mechanism of compensation for public service charges is funded as follows:

- the costs linked to the energy transition, which correspond to the subsidy mechanisms for renewable energies, and the reimbursement of the past accumulated shortfall in compensation borne by EDF as measured at 31 December 2015, are registered in a special "energy transition" budget item created by the amended finance law for 2015. Law no. 2016-1917 of 29 December 2016 (the finance law for 2017) stipulated that the two sources of additional funding for this special budget item would be a portion of the domestic tax on coal, lignite and coke (TICC), and a portion of the domestic tax on energy products (TICPE), the latter providing most of the funding. The finance law for 2020 replaced the percentages of the TICC and TICPE by a set amount, to avoid the uncertainties of forecast income from these taxes, and broadens the sources of funding for the "energy transition" budget item by including the proceeds of auctions of Guarantees of Origin as allowed by Article L. 314-14-1 of the Energy Code. The initial French finance law for 2020 also proposes to discontinue this "energy transition" budget item in 2021, with the costs concerned subsequently covered directly by the general budget;
- other public service charges excluding costs associated with the subsidy mechanisms for renewable energies (*i.e.* costs relating to fuel poverty, tariff equalisation in zones that are not connected to France's mainland network, cogeneration, the budget for the energy ombudsman, etc.) are registered directly in the general budget;
- income generated by the domestic tax on the final consumption of electricity, now renamed the Compensation for Public Electricity Charges (CSPE) goes directly into the general budget. The CSPE tax is collected directly from final consumers of electricity in the form of an additional levy on the electricity sale price (and collected from electricity suppliers), or directly from electricity producers that produce electricity for their own uses.

The level of the CSPE tax was set in 2016 at a full rate of €22.5/MWh, and eight reduced rates ranging from €12/MWh to €0.5/MWh depending on criteria of electro-intensiveness, business category and the risk of carbon leakage from installations (the risk of industries relocating to countries where greenhouse gas emissions are higher due to their electricity mix). The level remains unchanged in 2020.

The amended finance law no. 4 for 2020 also applied an upward adjustment to the amounts of compensation payable by the State in 2020 for:

- public service charges borne in 2019 (the total differential observed between the readjusted forecast for 2019 charges established in July 2019 and the actual charges for 2019 observed in July 2020);
- and public service charges borne in 2020 (the partial differential between the initial forecast for 2020 charges established in July 2019 and the readjusted forecast established in July 2020).

These expenses had increased due to the larger differential between the market price for electricity and the purchase obligation tariff payable to producers.

5.4.2 Net income on deconsolidation and gains on disposal of fixed assets

In 2020, net income on deconsolidation and gains on disposal of property, plant and equipment mainly includes gains on sales of EDF Renewables' generation assets as part of the Development and Sale of Structured Assets (DSSA) activities, amounting to €210 million (€560 million in 2019 including notably the sale of NnG, see note 3.1.2).

5.4.3 Other items

Other items mainly include costs relating to energy savings certificates used or consumed during the year, additional remuneration paid to producers of electricity from renewable sources in France and losses consisting of non-recoverable operating receivables. The unfavourable change in other items in 2020 is principally explained by the increase in this additional remuneration and the rising costs related to energy savings certificates.

The additional remuneration paid to electricity producers using renewable energies was introduced by France's law on the Energy Transition for green growth. It is a support mechanism intended to guarantee reasonable remuneration for producers who sell their energy directly on the markets, by compensating for the differential between the revenues from those sales and a reference amount. This mechanism complements the purchase obligation system.

From the first half of 2020, other items also include income and expenses related to closure of the Fessenheim plant.

Closure of Fessenheim nuclear power plant

In accordance with the application for termination of operations and the declaration of the permanent shutdown of both reactors at Fessenheim nuclear power plant sent by EDF to the Minister for the Ecological and Inclusive Transition and to the ASN on 30 September 2019, EDF shut down reactor 1 on 22 February 2020 and reactor 2 on 30 June 2020.

On 27 September 2019, due to the cap on nuclear power output set by the "energy transition for green growth" law of 17 August 2015, the French State and EDF signed a protocol agreement whereby the State will compensate EDF for the early closure of Fessenheim.

The compensation paid under the terms of this protocol comprises:

- initial instalments to compensate for expenses incurred after the closure of the plant (end-of-operations expenditure, BNI taxes, dismantling costs and staff redeployment costs), which will be paid over a 4-year period following the closure. An amount of €370 million was received on 14 December 2020 (see note 13.5).

  This compensation is recognised as income in profit and loss as and when the associated costs are incurred;
- subsequent payments corresponding to the lost income that would have been generated by future power generation up until 2041, based on Fessenheim's previous output figures and calculated "*ex post*" on the basis of nuclear power sale prices, particularly observed market prices.

Since its decoupling from the network, the Fessenheim plant has entered a post-operating phase that will last approximately five years. During that period, units 1 and 2 will continue to be operated and maintained as "defueled core" and "evacuated fuel" reactors. This will require a series of technical and administrative operations.

All the post-operating expenses and income associated with the closure of the two units in 2020 are recognised in other operating income and expenses. At 31 December 2020, they mainly comprise:

- expenses of €113 million (salaries and social security charges for labour at the site amounting to €42 million, purchases of goods and services amounting to €43 million, taxes other than income taxes, mainly payroll taxes, energy taxes and local taxes amounting to €28 million);
- the compensation defined in the protocol for expenses that will be incurred after the closure, amounting to €50 million, recognised as an operating subsidy in the income statement under the methods explained above.

Energy savings certificates

Accounting principles and methods

In France, the Law of 13 July 2005 introduced a system of energy savings certificates. Suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level became subject to energy savings obligations, initially for a three-year period.

To meet this obligation, three sources are available to the EDF group: supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors.

Expenses incurred for this purpose are recorded in expenses of the year concerned, in "Other operating income and expenses". Expenses in excess of the accumulated obligation at year-end are included in inventories and may be used to cover the obligation in later years.

A provision is recognised if the energy savings achieved are lower than the cumulative energy savings obligation at the year-end. The amount of the provision is equal to the cost of actions still to be taken to extinguish the obligations related to the energy sales made.

Energy saving regulations in France

Decree 2017-690 of 2 May 2017 issued by the French Ministry for the Environment, Energy and the Sea substantially raised the obligation levels for the fourth period of energy savings obligations (initially running from 1 January 2018 to 31 December 2020) to 1,200TWhc for the "standard" obligations and 400TWhc for the obligations that are intended to benefit households in situations of energy poverty, compared to 700TWhc and 150TWhc respectively for the previous period.

Law no. 2019-1147 of 8 November 2019 relating to Energy and the Climate, as well as prolonging the fourth period of the energy savings certificates scheme, included a chapter on measures against fraud concerning these certificates designed to increase the number and effectiveness of controls and sanctions.

If there is a shortfall in certificates surrendered at the end of the period, obligated actors must pay a fine of €15 per MWhc of shortfall.

In order to fulfil these obligations, the Group made every effort to gradually increase its number of energy savings certificates, taking advantage of the "*Coup de pouce*" operations launched in France early in 2019 (subsidies for insulation, financial aid for replacing oil heating by heat pumps, 50% additional energy savings subsidy for heat pump users, special offers for heat pump maintenance contracts, etc.).

The Group currently considers that due to the combined effect of the expected increase in certificates earned by the end of 2021 and the extension of the fourth period, there is no risk of a shortfall in energy savings certificates at the end of the period.

Note 6 Net changes in fair value on energy and commodity derivatives, excluding trading activities

Accounting principles and methods

This item essentially consists of changes over the period in the fair value of derivatives used for economic hedging of commodity purchases or sales that are not eligible for hedge accounting as defined in IFRS 9, and are therefore included directly in profit and loss. The Group report these changes in a specific line of the income statement, "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" below the operating profit before depreciation and amortisation.

(in millions of euros)	2020	2019
NET CHANGES IN FAIR VALUE ON ENERGY AND COMMODITY DERIVATIVES, EXCLUDING TRADING ACTIVITIES	**(175)**	**642**

Net changes in fair value on Energy and Commodity derivatives, excluding trading activities, decreased from €642 million in 2019 to €(175) million in 2020, principally due to high price volatility observed on the markets for other commodities, especially electricity (a mainly price-related rather than volume-related effect), and Edison's gas positions.

Note 7 Other income and expenses

Other income and expenses amount to €(487) million for 2020. They principally comprise exceptional additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR, totalling €(397) million in the first half of 2020. These additional costs are considered as abnormal costs under IAS 16 (paragraph 22) and cannot be included in the cost of assets under construction.

Other income and expenses includes restructuring expenses in certain Group entities, and other items which are operating income and expenses by nature but of non-significant amounts individually.

Other income and expenses amounted to €(185) million for 2019. They included the €(30) million cost of the ERO 2019 employee shareholding offer undertaken during the first half of 2019, restructuring expenses in certain Group entities, and other items which are operating income and expenses by nature but of non-significant amounts individually.

Note 8 Financial result

8.1 Cost of gross financial indebtedness

Details of the components of the cost of gross financial indebtedness are as follows:

(in millions of euros)	2020	2019
Interest expenses on financing operations*	(1,699)	(1,801)
Change in the fair value of derivatives and hedges of liabilities	90	(14)
Transfer to income of changes in the fair value of cash flow hedges	(8)	(40)
Net foreign exchange gain on indebtedness	7	49
COST OF GROSS FINANCIAL INDEBTEDNESS	**(1,610)**	**(1,806)**

* *Interest expenses on financing operations includes interest on the IFRS 16 lease liability amounting to €(80) million in 2020 and €(85) million in 2019.*

8.2 Discount effect

The effect of unwinding the discount primarily concerns provisions for the back-end of the nuclear cycle, decommissioning and last cores, and long-term and post-employment employee benefits.

Details of the final discount effect are as follows:

(in millions of euros)	2020	2019
Provisions for long-term and post-employment employee benefits (1)	(637)	(931)
Provisions for the back-end of the nuclear cycle, decommissioning and last cores (2)	(2,679)	(2,116)
Other provisions and advances	(417)	(114)
DISCOUNT EFFECT	**(3,733)**	**(3,161)**

(1) See note 16.1.3.
(2) Including the effect of discounting the receivable corresponding to amounts reimbursable by the NLF (see note 18.1.3).

The increase in the unwinding discount effect on nuclear provisions is mainly due to a decrease in the real discount rate applied for nuclear provisions in France of 20bp in 2020 (compared to 10bp in 2019).

The increase in the unwinding discount effect on "Other provisions and advances" is explained by substantially lower discount rates in 2020 than 2019 for these provisions (mainly provisions for onerous contracts), as a result of the change in method for determining discount rates, which now refers to an interest rate curve (see note 15.1.1.5).

8.3 Other financial income and expenses

Other financial income and expenses comprise:

(in millions of euros)	2020	2019*
Financial income on cash and cash equivalents	35	17
Gains/(losses) on other financial assets (including loans and financial receivables)	181	248
Gains/(losses) on debt and equity securities	691	878
Changes in financial instruments carried at fair value through profit and loss	1,253	2,338
Other financial expenses	(102)	(134)
Foreign exchange gain/loss on financial items other than debts	(254)	(7)
Return on fund assets	378	523
Capitalised borrowing costs	579	740
OTHER FINANCIAL INCOME AND EXPENSES	**2,761**	**4,603**

* *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations finalised (see note 1.4.2).*

"Gains/(losses) on debt and equity securities" in 2020 principally include:

- €518 million of dividends and interest income on debt securities (€740 million in 2019);
- €173 million of net gains and losses on sales of debt securities carried at fair value through OCI with recycling (including 162 million on dedicated assets), compared to €138 million in 2019 (including €136 million on dedicated assets).

Other financial income and expenses include changes in fair value on financial instruments, amounting to €1,253 million. With the high market volatility, notably caused by the Covid-19 pandemic, this favourable overall change for the year was driven by a €1,214 million increase in the fair value of debt and equity securities (including €1,218 million relating to dedicated assets) and a €39 million increase in the fair value of derivatives. In 2019, changes in financial instruments carried at fair value through profit and loss amounted to €2,338 million, including €2,545 million relating to dedicated assets.

The decrease in capitalised borrowing costs relates to the suspension of capitalisation of interim interest relating to Flamanville 3 between March and July (see note 1.4.1.3).

Note 9 Income taxes

Accounting principles and methods

Income taxes include the current tax expense (income) and the deferred tax expense (income), calculated under the tax legislation in force in the countries where earnings are taxable.

In compliance with IAS 12, current and deferred taxes are generally recorded in the income statement or in equity symmetrically to the underlying operation.

Under IAS 32, income taxes on distributions to holders of equity instruments (notably dividends and the remuneration paid to holders of perpetual subordinated bonds) must be recognised in accordance with IAS 12. The Group considers that these distributions are paid out of previous years' accumulated profits and as a result the associated tax effects are included in the net income for the period.

In application of IFRIC 23, a tax asset or liability is recognised when there is uncertainty over income tax treatments. If the Group considers it likely that the tax authorities will not accept its chosen treatment, it recognises a tax liability, and if it considers it likely that the tax authorities will reimburse a tax that has already been paid, it recognises a tax asset. The tax assets and liabilities relating to these uncertainties are estimated on a case-by-case basis and stated at the most likely amount, or the weighted average of the various outcomes considered. These tax assets and liabilities are included in deferred taxes.

The current tax expense (income) is the estimated amount of tax due on the taxable income for the period, calculated using the tax rates adopted at the year-end.

Deferred taxes result from temporary differences between the book value of assets and liabilities and their tax basis. No deferred taxes are recognised for temporary differences generated by:

- goodwill which is not tax deductible;
- the initial recognition of an asset or liability in a transaction which is not a business combination and does not affect the accounting profit or taxable profit (tax loss) at the transaction date;
- investments in subsidiaries and associates, investments in branches and interests in joint arrangements, when the Group controls the timing of reversal of the temporary differences, and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred tax assets and liabilities are valued at the expected tax rate for the period in which the asset will be realised or the liability extinguished, based on tax rates adopted at the year-end. If the tax rate changes, deferred taxes are adjusted to the new rate and the adjustment is recorded in the income statement, unless it relates to an underlying for which changes in value are recorded in equity, for example in accounting for actuarial gains and losses or fair value on hedging instruments and debt or equity securities.

Deferred taxes are reviewed at each closing date, to take into account changes in tax legislation and the prospects for recovery of deductible temporary differences. Deferred tax assets are only recognised when it is probable that the Group will have sufficient taxable profit to utilise the benefit of the asset in the foreseeable future, or beyond that horizon, if there are deferred tax liabilities with the same maturity.

Deferred tax assets and liabilities are reported on a net basis, determined at the level of a tax entity or tax group.

9.1 Breakdown of tax expense

Details are as follows:

(in millions of euros)	2020	2019*
Current tax expense	(747)	(1,597)
Deferred taxes	(198)	65
TOTAL	**(945)**	**(1,532)**

** Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

In 2020, €(604) million of the current tax expenses relates to French companies, and €(143) million relates to other subsidiaries (€(1,519) million and €(78) million respectively in 2019).

9.2 Reconciliation of the theoretical and effective tax expense (tax proof)

(in millions of euros)	2020	2019 (1)
Income of consolidated companies before tax	**1,293**	**6,393**
Income tax rate applicable to the parent company	32.02%	34.43%
Theoretical tax expense	**(414)**	**(2,201)**
Differences in tax rate (2)	(225)	232
Permanent differences (3)	6	162
Taxes without basis (4)	(27)	118
Unrecognised deferred tax assets (5)	(288)	156
Other	3	1
ACTUAL TAX EXPENSE	**(945)**	**(1,532)**
EFFECTIVE TAX RATE	**73.10%**	**23.96%**

(1) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

The income tax expense amounts to €(945) million in 2020, corresponding to an effective tax rate of 73.10% (compared to €(1,532) million in 2019, corresponding to an effective tax rate of 23.96%). The €587 million decrease in the Group's tax expense between 2019 and 2020 essentially reflects the €5,100 million decrease in net income before tax, generating a lower tax charge of €1,633 million; however, the unfavourable Council of State decision issued in December 2020 questioning the tax-deductibility of certain long-term liabilities of EDF SA has an impact of €538 million, including unrecognised tax assets of €(361) million due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon; the unfavourable effect of the increase in the income tax rate from 17% to 19% in the United Kingdom; and the absence of any favourable effect of asset disposals in 2020 (after the sales of Alpiq and NnG in 2019).

After elimination of these non-recurring items (principally fair value changes and unrealised gains and losses on financial assets, impairment, the consequences of tax litigation, and the impact of changes in the UK tax rate), the effective current tax rate for 2020 is 19.0%, compared to 18.0% in 2019.

The main factors explaining the difference between the theoretical tax rate and this effective rate are:

- 2020:
  - (2) the unfavourable impact of tax rate differences amounting to €225 million, mainly explained by an increase in the UK income tax rate from 17% to 19% and the difference between the current tax rate (32.02%) and deferred tax rate in France (28.41% or 25.82%, depending on the timing of reversal of the temporary differences),
  - (4) the economic impact of tax litigation, amounting to €(175) million, partly offset by the positive effect of deduction of payments made to bearers of perpetual subordinated bonds amounting to €162 million,
  - (5) the effect of non-recognition of deferred tax assets, amounting to €(288) million, including €(361) million of deferred taxes recognised in connection with tax litigation (resulting from the future deductibility of expenses whose deductibility is temporarily being questioned), due to the Group's prudent policy concerning recognition of deferred taxes beyond a 10-year horizon ;
- 2019:
  - (2) the favourable impact of differences in tax rates between the French rate of 34.43%, the Italian rate of 24% and the British rate of 19%, amounting to €185 million,
  - (3) the favourable impact of disposals of investments and assets subject to a reduced tax rate, amounting to €160 million (principally Alpiq and NnG),
  - (4) the impact of deduction of payments made to bearers of perpetual subordinated bonds, amounting to €204 million.

9.3 Change in deferred tax assets and liabilities

(in millions of euros)	2020	2019
Deferred tax assets	557	978
Deferred tax liabilities	(2,295)	(1,987)
Net deferred taxes at 1 January	**(1,738)**	**(1,009)**
Change in net income	(198)	28
Change in equity	(215)	(402)
Translation adjustments	72	(66)
Changes in scope of consolidation*	69	(275)
Other movements	45	(14)
NET DEFERRED TAXES AT 31 DECEMBER	**(1,965)**	**(1,738)**
Deferred tax assets	1,150	557
Deferred tax liabilities	(3,115)	(2,295)

* *Changes in the scope of consolidation essentially concern the reclassification of E&P concession assets as assets held for sale.*

In 2020, €(238) million of the change in deferred tax assets included in equity results from actuarial gains and losses on post-employment benefits (€(69) million in 2019).

9.4 Breakdown of deferred tax assets and liabilities by nature

(in millions of euros)	31/12/2020	31/12/2019
Deferred taxes:		
Fixed assets	(6,194)	(6,141)
Provisions for employee benefits	5,222	5,018
Other provisions and impairment	321	561
Financial instruments	290	74
Tax loss carryforwards and unused tax credits	1,172	1,292
Other	711	333
Total deferred tax assets and liabilities	**1,523**	**1,137**
Unrecognised deferred tax assets	(3,489)	(2,875)
NET DEFERRED TAXES	**(1,965)**	**(1,738)**

At 31 December 2020, unrecognised deferred tax assets represent a potential tax saving of €3,489 million (€2,875 million at 31 December 2019), mainly relating to France and the United States.

In France, this potential tax saving, which amounts to €2,900 million (€2,091 million at 31 December 2019), essentially concerns deferred tax assets on employee benefits. These deferred tax assets have no expiry date.

In the United States, this potential tax saving amounts to €428 million (€473 million in 2019) and relates mainly to negative taxable earnings generating losses which can be carried forward until dates between 2030 and 2037 (in the case of losses generated before 31 December 2017), or for an unlimited period (in the case of losses generated after that date).

Recognised deferred tax assets on tax loss carryforwards and unused tax credits amount to €584 million (€543 million in 2019) and principally concern the United States (€151 million in 2020, €197 million in 2019), United Kingdom (€173 million in 2020, €118 million in 2019), France (€52 million in 2020, €37 million in 2019) and in Germany (€47 million in 2020, €26 million in 2019). They have been recognised due to the existence of deferred tax liabilities on the same tax entities that will reverse over the same time horizon, or because there are prospects of taxable profits.

Note 10 Property, plant and equipment and intangible assets (excluding French public electricity distribution concession assets)

Details of property, plant and equipment and intangible assets (excluding French electricity distribution concession assets) are as follows:

(in millions of euros)	*Notes*	31/12/2020	Assets in progress*	31/12/2019	Assets in progress*
Goodwill	*10.1*	10,265	n.a.	10,623	n.a.
Other intangible assets	*10.2*	9,583	1,581	9,350	1,415
Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets	*10.3*	92,600	39,460	89,099	34,755
Right-of-use assets	*10.4*	*4,116*	*n.a.*	*4,333*	*n.a.*
Property, plant and equipment operated under concessions other than French electricity distribution concessions	*10.5*	6,858	574	6,860	1,155
TOTAL PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLE ASSETS (EXCLUDING FRENCH ELECTRICITY DISTRIBUTION CONCESSION ASSETS)		**119,306**	**41,615**	**115,932**	**37,325**

** Assets in progress are presented in note 10.6.*
n.a.: not applicable.

10.1 Goodwill

Accounting principles and methods

Determination of goodwill

In application of IFRS 3, "Business combinations"(see note 3), goodwill is the difference between:

- the sum of the following items:
  - the acquisition-date fair value of the price paid to acquire control,
  - the value of non-controlling interests in the entity acquired, and
  - for acquisitions achieved in stages, the acquisition-date fair value of the Group's share in the acquired entity before it acquired control; and
- the net value of the assets acquired and liabilities assumed, measured at fair value at the acquisition date.

When this difference is negative it is immediately included in net income.

The fair values of assets and liabilities and the resulting goodwill are finalised within twelve months of the acquisition.

Measurement and presentation of goodwill

Goodwill on acquisition of subsidiaries is disclosed separately in the balance sheet. Impairment on this goodwill is reported under the heading "Impairment" in the income statement. After initial recognition, goodwill is carried at cost less any impairment recognised.

Goodwill on acquisition of associates and joint ventures is included in the investment's net book value. Impairment on this goodwill is included under the heading "Share in income of associates and joint ventures".

Goodwill is not amortised, but impairment tests are carried out as soon as there is an indication of possible loss of value, and at least annually, as described in note 10.8.

In 2020, goodwill primarily related to Framatome (€1,332 million) and EDF Energy (€7,569 million). The breakdown by operating segment is presented in note 4.1.

Changes in goodwill in 2020 and 2019 were as follows:

(in millions of euros)	31/12/2020	31/12/2019
Net book value at opening date	**10,623**	**10,195**
Acquisitions	139	66
Disposals	-	-
Impairment (note 10.8)	(31)	(57)
Translation adjustments	(439)	392
Other changes	(27)	27
NET BOOK VALUE AT CLOSING DATE	**10,265**	**10,623**
Gross value at closing date	11,032	11,418
Accumulated impairment at closing date	(767)	(795)

The changes in goodwill in 2020 primarily related to:

- the acquisition of Pod Point by EDF Energy for €74 million, a company specialising in charging for electric vehicles in the United Kingdom;
- the first consolidation of Energy2market for €37 million;
- translation adjustments of €(439) million, principally due to the pound sterling's depreciation against the euro.

The changes in goodwill in 2019 primarily related to:

- the acquisition of Foxguard by Framatome, acquisition of service entities in Belgium, and the first consolidation of the Cyclife subsidiaries in the United Kingdom and Sweden;
- translation adjustments of €392 million, principally due to the pound sterling's rise against the euro.

10.2 Other intangible assets

Accounting principles and methods

General principles

Other intangible assets mainly comprise:

- software, which is amortised on a straight-line basis over its useful life, including SaaS (Software as a Service) contracts which are not treated as service contracts and included in expenses. To qualify for treatment as fixed assets, SaaS contracts must confer a right of control to the user in addition to access to the software for a fixed period;
- research and development costs that qualify for capitalisation under IAS 38 amortised on a straight-line basis over their foreseeable useful life;
- purchased brands with an indefinite useful life, or amortised on a straight-line basis over their useful life;
- operating or usage rights for power plants, which are amortised on a straight-line basis over the useful life of the underlying asset;
- rights or licenses relating to hydrocarbon concessions, which are amortised under the Unit Of Production (UOP) method, and exploration expenses amortised over the year (in accordance with IFRS 6, "Exploration for and Evaluation of Mineral Resources");
- the positive value of energy purchase/sale contracts stated at fair value as part of a business combination governed by IFRS 3: this value is amortised as the contractual deliveries take place;
- assets related to concession contracts governed by IFRIC 12, under the "intangible model" (see note 10.5);
- technology related to activities as designer and supplier of nuclear steam supply systems and manufacturer of control rod clusters and nuclear fuel (Framatome) including codes and methods, EPR technology, patents and manufacturing processes, all amortised over their useful life;
- purchased customer contracts and relations, amortised over their useful life;
- incremental costs of winning or renewing customer contracts, which are amortised over the average duration of customer contracts;
- intangible assets related to environmental regulations.

Intangible assets relating to environmental regulations

These include greenhouse gas emission rights and renewable energy certificates purchased (see notes 20.1.1 and 20.1.2).

Greenhouse gas emission rights

EU Directive 2003/87/EC set up a greenhouse gas emission quota system for the European Union.

This system was incorporated into national laws. Among other things it requires obligated actors, which is the case of EDF, to surrender to the State a number of greenhouse gas emission credits each year, corresponding to their emissions for the year.

In the EDF group, the entities subject to this Directive are EDF, EDF Energy, Edison, Dalkia, and Luminus.

The accounting treatment of emission rights depends on the holding intention. Two economic models coexist in the Group:

- rights held under the "Trading" model are included in "Other inventories" at fair value. The change in fair value observed over the year is recorded in the income statement;
- rights held to comply with regulatory requirements on greenhouse gas emissions (the "Generation" model) are recorded in intangible assets as "Greenhouse gas emission rights – green certificates":
  - at acquisition cost when purchased on the market,
  - at nil value when allocated free of charge (in countries that still have a free allocation system).

A provision is established at the year-end when the estimated annual emissions by an entity are higher than the rights held or purchased on the forward market, less any rights sold on the forward market (see note 17.2).

This provision is equal to the acquisition cost up to the amount of rights acquired on the spot or forward markets, and to market prices for the balance. It is cancelled when the rights are surrendered to the State.

At the closing date, the portfolio of emission rights and the obligation to surrender rights for the emissions of the year are presented gross, without netting.

If the number of emission rights at the end of the year and not subject to forward sale is higher than the number of rights to be surrendered to the State for the year's emissions, an impairment test must be applied to the excess. If the realisable value is lower than the net book value, impairment is booked.

Renewable energy certificates (green certificates)

In application of EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources, every EU member state has set national targets for consumption of electricity from renewable sources.

States can use two possible mechanisms to meet these targets:

- introducing a specific sales tariff for energy from renewable sources (this system is used in France and Italy);
- introducing a system of renewable energy certificates to be surrendered by energy suppliers (this system is used in the United Kingdom (Renewable Obligation Certificates) and Belgium (*Certificats verts*)).

For renewable energy certificate systems, the Group applies the following accounting treatment:

- certificates earned through energy generation are not recognised, since their cost is nil;
- certificates purchased are recognised as intangible assets in the line "Greenhouse gas emission rights – green certificates";
- a provision is established to reflect the obligation to surrender certificates. It is based on the cost of certificates earned (with nil value) and purchased (on the spot or forward market), the market price of the certificates still be purchased, and where relevant the market price or penalty price for the balance. The provision is cancelled when the certificates are surrendered to the State (see note 17.2).

The net value of other intangible assets breaks down as follows:

(in millions of euros)	31/12/2019	Acquisitions	Disposals	Translation adjustments	Changes in scope [2]	Other movements	31/12/2020
Software	5,295	850	(155)	(62)	11	31	5,970
Positive fair value of commodity contracts acquired in a business combination	504	-	-	-	-	-	504
Greenhouse gas emission rights – green certificates	474	2,056	(1,752)	(13)	-	4	769
Other intangible assets	7,919	421	(327)	(44)	(332)	(91)	7,546
Intangible assets in development [1]	1,415	175	(4)	(7)	-	2	1,581
Gross value	**15,607**	**3,502**	**(2,238)**	**(126)**	**(321)**	**(54)**	**16,370**
Software	(2,963)	(775)	153	45	(7)	(22)	(3,569)
Positive fair value of commodity contracts acquired in a business combination	(191)	(25)	-	-	-	-	(216)
Other intangible assets	(3,103)	(528)	317	26	272	14	(3,002)
Accumulated amortisation and impairment	**(6,257)**	**(1,328)**	**470**	**71**	**265**	**(8)**	**(6,787)**
NET VALUE	**9,350**	**2,174**	**(1,768)**	**(55)**	**(56)**	**(62)**	**9,583**

(1) Increases in intangible assets in development are stated net of the effects of newly-commissioned assets. Intangible assets in development are detailed in note 10.6.

(2) Changes in scope essentially comprise the reclassification the assets of Infrastrutture Distribuzione Gas (IDG), owned by Edison, as assets held for sale (see note 3.2).

The gross value of other intangible assets at 31 December 2020 includes:

- the Edison brand and intangible assets related to Edison's hydropower concessions, amounting to €945 million and €489 million respectively;
- the Dalkia brand and intangible assets related to Dalkia's concession agreements in France, amounting to €141 million and €1,209 million respectively;
- the Framatome brand, Framatome's nuclear technology-related intangible assets and Framatome's customer contracts, amounting to €151 million, €777 million and €288 million respectively.

Impairment of €(85) million was recorded in respect of other intangible assets in 2020 (€(47) million in 2019).

EDF's research and development expenses recorded in the income statement total €518 million for 2020 (€523 million in 2019).

10.3 Property, plant and equipment used in generation and other tangible assets owned by the Group

Accounting principles and methods

Property, plant and equipment is recorded at acquisition or production cost:

- the cost of facilities developed in-house includes all labour and materials costs, and all other production costs that can be included in the construction of the asset;
- borrowing costs attributable to the financing of an asset incurred during the construction period are included in the value of the asset provided it is a qualifying asset as defined by IAS 23 "Borrowing costs";
- the cost of property, plant and equipment also includes the initial estimate of decommissioning costs. These costs are recognised in assets against the provision recognised to cover these obligations. At the date of commissioning, these assets are measured and recorded in the same way as the corresponding provision (see note 15);
- decommissioning costs for nuclear generation installations also include last core costs (see note 15).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded in "Property, plant and equipment", and subsequent payments by the partner are deducted from the accrued income.

The Group capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

Strategic safety spare parts for generation facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

The costs of operations that are necessary for generation assets to remain in service, and are undertaken at the time of scheduled shutdowns, particularly during major inspections, are capitalised and amortised over a period corresponding to the time elapsing between two inspections.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Group expects to draw future economic benefits from their use.

Depending on each country's specific regulations and contractual arrangements, the expected useful lives for the main facilities are as follows:

- nuclear generation facilities: 40 to 50 years;
- wind farm and photovoltaic facilities: 20 to 25 years;
- fossil-fired power plants (mainly CCGT-Combined Cycle Gas Turbine plants): 25 to 45 years;
- transmission and distribution installations (lines, substations): 20 to 60 years;
- other general plant and machinery: 10 to 20 years.

The net values of property, plant and equipment used in generation and other tangible assets owned by the Group are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Translation adjustments	Changes in the scope of consolidation [1]	Other movements [2]	31/12/2020
Land and buildings	13,797	479	(89)	(62)	-	(34)	14,091
Nuclear power plants	75,213	3,723	(1,778)	(631)	-	802	77,329
Fossil-fired & hydropower plants	18,486	330	(341)	(185)	1	(125)	18,166
Other installations, plant, machinery, equipment & other	21,316	1,599	(559)	(812)	(1,042)	118	20,620
Right-of-use assets [3]	5,355	479	-	(48)	(21)	(32)	5,733
Assets in progress [4]	34,959	5,362	(30)	(850)	12	162	39,616
Gross value	**169,126**	**11,972**	**(2,797)**	**(2,588)**	**(1,050)**	**891**	**175,555**
Land and buildings	(7,518)	(406)	67	10	5	(1)	(7,843)
Nuclear power plants	(49,345)	(3,522)	1,696	337	-	481	(50,353)
Fossil-fired & hydropower plants	(12,765)	(1,352)	339	178	-	150	(13,450)
Other installations, plant, machinery, equipment & other	(9,173)	(1,293)	519	309	143	(41)	(9,536)
Right-of-use assets [3]	(1,022)	(697)	-	5	2	95	(1,617)
Assets in progress [4]	(204)	(40)	3	6	(7)	86	(156)
Depreciation and impairment	**(80,027)**	**(7,310)**	**2,624**	**845**	**143**	**770**	**(82,955)**
NET VALUE	**89,099**	**4,662**	**(173)**	**(1,743)**	**(907)**	**1,661**	**92,600**

(1) Changes in the scope of consolidation essentially relate to EDF Renewables.

(2) Other movements include the effect on assets associated with provisions and underlying assets of the €707 million change in the real discount rate used to calculate provisions related to EDF's nuclear generation (see note 15.1) and EDF Energy for €322 million (see note 15.2).

(3) Right-of-use assets are detailed in note 10.4.

(4) Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.

The changes observed in property, plant and equipment used in generation owned by the Group include a €(1,093) million impact of translation adjustments due to the rise of the euro against the pound sterling.

Depreciation period of coal-fired plants in France

In view of France's Energy and Climate law of 8 November 2019, the ends of the depreciation periods for the Le Havre and Cordemais coal-fired plants were changed at 1 June 2019, setting the closure of Le Havre at 1 April 2021 while Cordemais is to continue operating until 2026, considering a possible conversion to biomass as part of the Ecocombust project. The date for Cordemais could still change depending on the decisions made about the project, which is currently under review by the public authorities. As a result of this change of dates, accelerated depreciation compared to the previous depreciation period is now recognised, amounting to €250 million in 2020 (€141 million in 2019).

10.4 Right-of-use assets

Accounting principles and methods

Under IFRS 16, applicable since 1 January 2019, a contract is, or contains, a lease if it confers the right to control the use of an identified asset for a period of time in exchange for a consideration.

Identified arrangements that do not have the legal form of a lease contract but nonetheless convey the right to control the use of an asset or group of specific assets to the purchaser are classified as leases by reference to IFRS 16.

Recognition of a lease contract as lessee under IFRS 16

The Group's lease contracts as lessee essentially concern real estate assets (office and residential properties), industrial installations (land, wind farms) and to a lesser extent vehicles, IT and industrial equipment.

IFRS 16 requires leases to be recognised in the lessee's balance sheet when the leased asset is made available, in the form of a "right-of-use" asset, presented in "Property, plant and equipment used in generation and other tangible assets owned by the Group, including right-of-use assets" with a corresponding financial liability associated with the lease commitment, presented in "Current and non-current financial liabilities".

Upon initial recognition of a lease, the right of use and the lease liability are valued by discounting the future lease payments over the term of the lease, taking into consideration assumptions regarding the renewal or termination of leases if the relevant options are reasonably certain to be exercised.

As a rule, since the implicit interest rate in a lease is difficult to determine, the lessee's incremental borrowing rate is used to discount the lease liability. This rate is based on zero-coupon EDF bond rates, adjusted for the currency risk, a country risk premium, the term of the lease contracts and the subsidiary's credit risk at the date of initial recognition of the contract. In certain cases, it is based on a subsidiary's specific incremental borrowing rate.

Subsequently, the right of use is amortised over the expected term of the lease, while the lease liability is stated at amortised cost, *i.e.* adding the interest recognised in the financial result, and deducting the amount of the lease payments made.

The Group applies the two exemptions allowed by IFRS 16, and as a result leases with a term of 12 months or less and leases of assets with individual value when new of less than USD 5,000 are not recognised in the balance sheet. Consequently, the payments on these leases are recognised on a straight-line basis over the lease term in the income statement.

If the Group performs a sale and leaseback operation – consisting of selling an asset to a third party and then renting it back as lessee – which is classified as a sale under IFRS 15, it measures the right-of-use asset resulting from the lease as the proportion of the asset's previous book value that corresponds to the right of use retained by the Group. Also, the gain on the sale of the asset by the Group only corresponds to the proportion of the right of use actually transferred to the third party. The lease liability is not adjusted, unless the conditions of the sale or lease do not reflect market values.

Off-balance sheet commitments presented in note 21.1.1 concern:

- short-term leases (12 months or less);
- leases of assets with low value (less than USD 5,000 when new);
- leases signed for which the leased assets have not yet been made available (for example, assets under construction).

Recognition of a lease contract as lessor

The accounting treatment of a lease contract in which the Group is lessor depends on the classification of the contract. For a finance lease which transfers substantially all risks and rewards inherent to ownership of the underlying asset to the lessee, the Group recognises a financial asset in its balance sheet instead of the initial fixed asset; in this case, the receivable is equal to the discounted value of future lease payments.

10.4.1.1 Change in right-of-use assets

(in millions of euros)	31/12/2019	Increases [1]	Decreases	Changes in the scope of consolidation	Other movements [2]	31/12/2020
Land and buildings	4,520	283	-	(31)	(32)	4,740
Other installations, plant, machinery, equipment & other	835	196	-	10	(48)	993
Gross value	**5,355**	**479**	**-**	**(21)**	**(80)**	**5,733**
Land and buildings	(541)	(555)	-	2	39	(1,055)
Other installations, plant, machinery, equipment & other	(481)	(142)	-	-	61	(562)
Depreciation and impairment	**(1,022)**	**(697)**	**-**	**2**	**100**	**(1,617)**
NET VALUE	**4,333**	**(218)**	**-**	**(19)**	**20**	**4,116**

(1) Increases concern right-of-use assets recognised in respect of new leases.
(2) Other movements include the effect of contract revisions on right-of-use assets and translation differences.

10.4.1.2 Impacts in the income statement

The main impacts of recognition in the income statement of lease contracts as lessor, in accordance with IFRS 16, are as follows:

(in millions of euros)	2020	2019
Income from subleases	56	73
Variable lease expenses	(46)	(45)
Expenses on short-term leases or leases of low-value assets	(106)	(167)
Income from sale and leaseback operations	-	-
Operating profit before depreciation and amortisation	**(96)**	**(139)**
Depreciation on right-of-use assets	(697)	(660)
Operating profit	**(793)**	**(799)**
Interest expense on the lease liability	(80)	(85)
Income before taxes of consolidated companies	**(873)**	**(884)**

10.4.1.3 Payments relating to leases

(in millions of euros)	2020	2019
TOTAL PAYMENTS RELATING TO THE LEASE LIABILITY	**(795)**	**(790)**

Payments relating to the lease liability mainly concern principal repayments, and amount to €719 million in 2020 (€721 million in 2019).

10.5 Property, plant and equipment operated under concessions other than French public electricity distribution concessions

Accounting principles and methods

The accounting treatment of public and private agreements depends on the nature of the agreements and their specific contractual features.

Concessions in France

In France, the Group is the operator for three types of concessions:

- public electricity distribution concessions granted by local authorities (municipalities or syndicated municipalities) (see note 11);
- hydropower concessions granted by the State;
- heat generation and distribution concessions from public authorities.

Hydropower concessions

Hydropower concessions follow standard rules approved by decree. For concessions granted before 1999, hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc.), while for more recent concessions, they also include hydropower generation equipment and switching facilities (alternators, etc.).

Most concessions that expired before 2012 were initially for 75 years and were renewed for terms of 30 to 50 years. However, the French government has not yet renewed 18 concessions that have expired. Since their expiry these concessions have thus been in the "rolling extension" situation defined by the law, which stipulates that at the expiry date of a concession, if no new concession has been established "the concession is extended on the existing terms until such time as a new concession is granted", so as to ensure continuity of operations in the meantime (Article L. 521-16 par. 3 of the French Energy Code).

As these concession agreements are not concerned by IFRIC 12 "Service concession agreements", the assets used, whether directly owned or part of the concession, are recorded under "Property, plant and equipment operated under concessions other than French public electricity distribution concessions" at acquisition cost.

The main depreciation periods applied are:

- hydroelectric dams: 75 years;
- electromechanical equipment used in hydropower plants: 50 years.

Heat generation and distribution concessions from public authorities

Heat generation and distribution concession agreements signed by Dalkia with public authorities confer the right to operate facilities remitted by or constructed at the request of those authorities for a limited period, under the concession-granting authority's supervision.

These agreements set the terms for remuneration and transfer of the facilities to the concession-granting authority or another operator taking over at the end of the agreement.

The assets are recorded as "Other intangible assets", in accordance with IFRIC 12 "Service concession agreements".

Concession assets generally comprise:

- boiler houses;
- networks;
- network extensions;
- network connections;
- and sometimes cogeneration assets.

Intangible assets are depreciated on a straight-line basis over the term of the concession, which is generally between 15 and 25 years.

Almost all of these assets are located in France.

Foreign concessions

Foreign concessions are governed by a range of contracts and national laws. Most assets operated under foreign concessions are recorded under "Property, plant and equipment operated under concessions other than French public electricity distribution concessions". Foreign concessions essentially concern Edison in Italy, which operates local gas distribution networks, hydropower generating plants and energy services under concessions. Edison owns all the assets except for some items of property, plant and equipment on the hydropower generation sites, which will be returned to the concession-granting authority for nil consideration or with an indemnity when the concession ends. In compliance with IFRIC 12, certain concession agreements are recorded as intangible assets.

Hydropower generation assets which will be returned for nil consideration at the end of the concession are depreciated over the duration of the concession.

The net values of property, plant and equipment operated under concessions other than French public electricity distribution concessions are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Changes in the scope of consolidation	Other movements	31/12/2020
Land and buildings	1,528	137	(9)	(16)	-	1,640
Fossil-fired & hydropower plants	11,021	718	(23)	29	(34)	11,711
Other	651	36	(11)	(2)	3	677
Assets in progress*	1,213	(528)	(5)	(30)	(60)	590
Gross value	**14,413**	**363**	**(48)**	**(19)**	**(91)**	**14,618**
Land and buildings	(956)	(34)	9	1	-	(980)
Fossil-fired & hydropower plants	(6,081)	(272)	19	24	28	(6,282)
Other	(458)	(36)	11	-	1	(482)
Assets in progress*	(58)	-	-	-	42	(16)
Depreciation and impairment	**(7,553)**	**(342)**	**39**	**25**	**71**	**(7,760)**
NET VALUE	**6,860**	**21**	**(9)**	**6**	**(20)**	**6,858**

* *Increases in assets in progress are stated net of the effects of newly-commissioned assets. Assets in progress are detailed in note 10.6.*

At 31 December 2020, property, plant and equipment operated under concessions other than French public electricity distribution concessions comprise concession facilities mainly located in France and in Italy (hydropower, excluding public electricity distribution).

10.6 Assets in progress

(in millions of euros)	2020	2019
Intangible assets	1,581	1,415
Property, plant and equipment used in generation and other tangible assets owned by the Group	39,460	34,755
Property, plant and equipment operated under concessions other than French public electricity distribution concessions	574	1,155
TOTAL ASSETS IN PROGRESS	**41,615**	**37,325**

Intangible assets

Intangible assets in progress include notably studies for the EPR 2 project, amounting to €577 million (€414 million at 31 December 2019).

A draft PPE published on 25 January 2019 by the Ministry for the Ecological and Inclusive Transition states that the Government, together with the industry, will conduct a programme of work by mid-2021 to examine the questions of the cost of new nuclear energy production and its advantages and disadvantages in relation to other low-carbon generation methods, the possible financing models, the project management modalities for new reactor projects and public consultation, and matters relating to the management of waste generated by the potential new nuclear fleet and based on this information and depending on developments in the energy situation, the Government will make a decision regarding the suitability of launching a renewal programme for nuclear installations. The Group is fully mobilised in the investigation and preparation of this case in all its components, in conjunction with the public authorities.

Property, plant and equipment used in generation and other tangible assets owned by the Group

At 31 December 2020, property, plant and equipment in progress used in generation and owned by the Group mainly comprise:

- Investments for the Flamanville 3 EPR amounting to €14,565 million, including capitalised interim interest of €3,291 million at 31 December 2020 (€13,653 million at 31 December 2019, including capitalised interim interest of €3,028 million). The amount capitalised for the Flamanville 3 project in the financial statements at 31 December 2020 is €14,792 million, which also includes €208 million [1] for assets that have been commissioned (see note 10.3).

  This capitalised amount of €14,792 million including capitalised interim interest, includes, in addition to the construction cost:

  - an inventory of spare parts and capitalised amounts totalling €466 million for related projects (notably the initial comprehensive inspection and North Area development);
  - €691 million of pre-operating expenses and other property, plant and equipment related to the Flamanville project; and
  - the elimination of internal balances on balance sheet items and margins between Framatome and EDF SA in connection with the Flamanville 3 EPR project (€277 million, essentially consisting of advances and progress payments);
  - giving a construction cost at historical value of €10,318 million in the consolidated financial statements at 31 December 2020, and a construction cost at completion (excluding borrowing costs) of €12.4 billion (in 2015 euros), as announced on 9 October 2019.

    In its report of July 2020 on EPR technology, the French Court of Auditors (Cour des comptes) stated that by its calculations, in addition to the construction cost of €12.4 billion (in 2015 euros) announced by EDF, there will be further costs that could reach €6.7 billion (in 2015 euros), including €4.2 billion of interest expenses. As stated above, at 31 December 2020 the capitalised interest amounts to €3.3 billion and other capitalised project costs amount to €1.2 billion.

    The non-recurring additional costs resulting from the necessary repairs to the main secondary circuit welds are recorded in other income and expenses at the amount of €397 million in 2020 (see note 7);
  - investments relating to Hinkley Point C, amounting to €13,586 million including capitalised interim interest of €518 million (€10,942 million at 31 December 2019 including capitalised interim interest of €318 million). In 2020 investments in this project amount to €2,868 million;
  - studies concerning Sizewell C amounting to €324 million (€219 million in 2019).

(1) €292 million in gross value, less €84 million of depreciation.

Investments in property, plant and equipment and intangible assets

Property, plant and equipment in progress increased by €4,705 million as the level of investment in 2020 was significantly higher than the amount of assets brought into service during the year (see note 10.3). Investments in property, plant and equipment and intangible assets during 2020 (see note 10.7) mainly concern:

- the France – Generation and Supply segment for €5,361 million, primarily investments made under the "*Grand Carénage*" programme, investments for Flamanville 3, and investments in hydropower generation;
- the United Kingdom segment for €3,679 million, where investments principally related to nuclear power generation;
- the EDF Renewables segment for €1,991 million, which saw a significant rise in wind and solar capacities under construction in France and North America, and in emerging countries.

Principal projects in progress and investments during the year

Grand Carénage programme

Since 2014 EDF has been implementing its "*Grand Carénage*" programme designed to enhance reactor safety and continue nuclear fleet operations beyond 40 years. The cost of this programme was estimated in 2015 at €55 billion (in 2013 euros) for the period 2014 to 2025. After optimisations and deferrals, this cost was revised in 2018 to €45 million in 2013 euros, *i.e.* €48.2 billion in current euros, still for the period 2014-2025.

On 29 October 2020, EDF adjusted the programme's cost to €49.4 billion in current euros from 2014 to 2025.

The new cost estimate mainly reflects the first findings on the works to be conducted in the context of the ongoing fourth periodic safety review of the Group's 900MW reactors. This review focuses on studies, modification work and initially unplanned additional equipment to improve safety levels. The estimate also factors in the revised duration of scheduled maintenance outages for ten-year and partial inspections, in response to prior year experience and the impacts of the Covid-19 pandemic for the period 2020-2022 (see note 1.4.1).

The *Grand Carénage* programme is continuing with 33 ten-year inspections conducted at the Group's 900MW, 1300MW and 1450MW reactors and 55 out of 56 emergency diesel generators commissioned.

The ASN's decision setting the requirements for 900MW reactors in the light of the conclusions of the generic phase of their fourth periodic review is expected by the end of February 2021.

Flamanville 3 EPR project

Developments in 2019

On 11 April 2019 [1], EDF announced that it was aware of the opinion of the Permanent Group of experts for nuclear pressure equipment (GP ESPN), made public on 11 April 2019, regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle [2] at the Flamanville EPR.

The Nuclear Safety Authority (ASN) had held a meeting of the GP ESPN on 9 April 2019 as part of its investigation into these quality deviations:

- on 3 December 2018, EDF submitted a technical file to the ASN presenting the procedures for repairing and upgrading the main secondary circuit welds, which had shown deficiencies with respect to the break preclusion requirements, as well as for the specific justification method for the 8 welds located in the reactor containment building structure;
- the file was examined by the ASN, with technical support from the Institute for Radiation Protection and Nuclear Safety (IRSN);
- based on this examination, discussions took place at a GP ESPN meeting attended by EDF, which presented the background facts, their analysis and the methods for dealing with the issue. EDF answered all the Permanent Group of experts' questions for the technical examination of this file.

EDF indicated at the time that the recommendations and solution avenues suggested by the Permanent Group of experts could have an impact on the commissioning schedule and construction cost, and that the Group would continue its discussions with the ASN, which was to issue its decision regarding action to be taken on this matter a few weeks later.

Consequently, the Group stated that a detailed update of the schedule and construction cost for the Flamanville EPR would be given after the ASN's decision had been published.

On 20 June 2019 [3], EDF announced that it was aware of the decision issued by the ASN in its letter of 19 June 2019 regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle at the Flamanville EPR.

In that letter, the ASN asked EDF to repair the eight containment penetration welds at the Flamanville EPR that were not compliant with the break preclusion principle.

On 26 July 2019 [4], EDF announced that three scenarios for upgrading the penetration welds were under consideration, and that after a detailed examination of the three scenarios and discussions with the ASN, the Group would communicate the schedule and cost implications of the selected scenario in the next few months. The Group also stated that commissioning could not be expected before the end of 2022.

This work then resulted in discussions with the ASN, which sent EDF [5] a letter on 4 October 2019 concerning the technical feasibility of these three scenarios.

The penetration weld repair scenario presented as preferred by EDF involves the use of remote-operated robots, designed to conduct high-precision operations inside the piping concerned, a technology developed for nuclear power plants in operation that must be qualified for penetration weld repairs. The aim is to have this scenario qualified and validated by the ASN by the end of 2020, at which date EDF will be able to initiate the repair work. A second scenario involving extraction and realignment work in the Safeguard Auxiliary Buildings is held at this stage as a fall-back solution.

Based on this penetration weld repair strategy, the EDF Board of Directors approved continuation of the Flamanville EPR construction at a meeting held on 8 October 2019.

This led the Group to adjust the schedule and the estimated construction cost for the Flamanville [6] EPR.

The provisional schedule for implementation of the preferred penetration weld repair scenario, if the objective of ASN validation is achieved, sets the date of fuel loading in late 2022 and the revised construction cost at €12.4 billion [7], an increase of €1.5 billion. Most of these additional costs will be treated as operating expenses [8], rather than being capitalised and will affect the financial years 2020, 2021 and 2022.

(1) Cf. press release of 11 April 2019.

(2) The break preclusion principle is a very high standard of quality with stricter requirements than nuclear pressure equipment regulations for the design, manufacturing and in-service monitoring of certain items of equipment. These stricter requirements must be sufficient to consider that rupture of this equipment is highly unlikely. When this standard is applied, a comprehensive study of the consequences of breaks in this piping is not required in the plant safety case.

(3) Cf. press release of 20 June 2019.

(4) Cf. press release of 26 July 2019.

(5) Cf. press release of 9 October 2019.

(6) The issue of deviation from the technical manufacturing standards for Framatome reactor components (stress-relieving heat treatment process for the welds with electrical resistance) concerns the four steam generators and pressuriser at Flamanville 3 EPR – see press release of 9 September 2019.

(7) In 2015 euros, excluding interim interest.

(8) IAS 16.22 concerning abnormal costs incurred in connection with self-constructed assets.

Developments in 2020

The main developments at the Flamanville site in 2020 were the following:

The second hot functional test phase started on 21 September 2019 was completed on February 2020. Hot functional testing checks plant performance under simulated normal operating conditions.

In the context of the Covid-19 pandemic, after a cluster of cases was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only (see note 1.4.1). General activity on the site resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020.

Functional tests of the open reactor vessel were successfully completed between 21 May and 25 June 2020.

Following the ASN's decision of 8 October authorising partial commissioning of the EPR, the first fuel assemblies arrived at the site on 26 October and are stored in the reactor building pool.

In parallel, the upgrading work continued on non-penetration welds on the main secondary circuit that had quality deviations or did not meet the break preclusion requirements defined by EDF, and several welds were repaired in August 2020 once the ASN issued its first authorisations. EDF also decided to include the welds on the circuit supplying water to the steam generators in the scope of the repairs concerning the main secondary circuit. Qualification of the repair procedure for these welds is currently in process, with the objective of performing the work in the second half of 2021. At this stage, the repairs concern a hundred welds in the secondary circuits.

A review was conducted in 2020 of the impact of France's first national lockdown on the Flamanville project. This did not lead to any change to the fuel loading dates or the construction cost announced in October 2019, but it showed that the project has no remaining margin in its schedule or cost. However, achievement of the targets depends on a number of factors, notably the ASN's examinations of EDF's proposed methods for repairing the main secondary circuit welds, particularly the qualification of welding robots for repairing the penetration welds.

Work on these repairs cannot begin until the ASN makes its final decision as to approval of the entire process involving remote-controlled robots, which has been deferred to the first quarter of 2021. This phase of the project is among those in the critical path for on-schedule finalisation of the EPR. A further review of the project will be conducted in 2021.

Hinkley Point C

Despite being affected by the Covid-19 health crisis (see note 1.4.1), progress continued on the Hinkley Point C project in 2020 as regards work on site, the design execution plans and the manufacturing of equipment. The project reached 4 milestones set for 2020:

- installation of the first safety pipes on the unit 1 nuclear island;
- completion of the raft for the unit 2 nuclear island (milestone J0) in line with the initial schedule of 2016;
- production of the feed water tank for unit 1;
- completion of the internal structure design for unit 1 reactor building.

Other advances were made on unit 1, particularly completion of the 3.5km cooling water tunnel and installation of the first liner ring in the reactor building. Significant progress was also made on Unit 2, which is following unit 1 with a 12-month time lag.

A detailed review of schedule and cost was performed in 2020, particularly to estimate the impact of the pandemic so far. The conclusions of this review were made public on 27 January 2021 and are as follows [1]:

- the start of electricity generation from Unit 1 is now expected in June 2026, compared to end-2025 as initially announced in 2016;
- the project completion costs are now estimated in the range of $£_{2015}$22 to 23bn [2]. As a consequence, the projected rate of return (IRR) for EDF is estimated between 7.1% and 7.2% [3];
- the risk of a COD delay for Units 1 and 2 is maintained at 15 and 9 months respectively . The realisation of this risk, which has a high probability, would incur generate a potential additional cost in the order of $£_{2015}$0.7bn, which would reduce the IRR for EDF by 0.3%.

The management of Hinkley Point C have set the objective of putting the dome of Unit 1 in place by the end of 2022.

Sizewell C

Alongside the HPC contracts signed by EDF and CGN in September 2016, agreements were also signed for the Sizewell C project in Suffolk in England, covering the development, construction and operation of two EPR units with total capacity of 3.2GW.

During the development phase prior to the final investment decision, EDF's share is 80% and CGN's share is 20%. The final investment decision could be made in mid-2022. The underlying assumption is that the majority of the project will be owned by non-Group investors, and EDF expects to become a minority shareholder with correspondingly limited rights at the time of the financial investment decision, at which point it will deconsolidate the project. The ability to make a final investment decision regarding Sizewell C will depend largely on definition of a regulatory framework and an appropriate funding model of a kind never yet implemented for a project of this scale in Europe. It is not currently certain that this will be achieved.

Development of this project is founded on a strategy of replication of the HPC project, which focuses on reducing construction costs, by lowering expenses through reducing risks. Sizewell C will therefore use EPR technology (with EDF as "Responsible designer") and should benefit from feedback from HPC.

On 24 June 2020, the UK's Planning Inspectorate formally accepted the Sizewell C planning application for examination. Examination of the application should begin in April 2021, which means that the Secretary of State should make a decision about planning permission by April 2022.

Another important milestone was reached on 30 June 2020 when Sizewell C applied to the Office for Nuclear Regulation (ONR) for a nuclear site licence to construct and operate the new power station.

After publication of the Energy White Paper on 14 December 2020, the British government officially declared that it was to start discussions on the Sizewell C project to consider the possible options. It said it would continue to explore several funding options for new nuclear operations, including the regulated asset base (RAB) funding model. Given the scale of the financing challenge, the government will also consider the possibility of public financing during construction, "provided there is clear value for money for consumers and taxpayers".

(1) Cf. press release of 27 January 2021. The information assumes the ability to begin a ramp up back to normal site conditions from the second quarter of 2021.

(2) The costs previously announced in the press release of 25 September 2019 were £2015 21.5-2.5bn. Costs net of operational action plans, in 2015 sterling, excluding interim interest and excluding forex effect versus the reference exchange rate for the project of 1 sterling = 1.23 euro. Costs are calculated by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index.

(3) EDF equity IRR calculated at the exchange rate of £1 = €1.13 and including the capped compensation mechanism in place between the project's shareholders. Previous IRR of 7.6%-7.8% was based on an exchange rate of £1 = €1.15.

10.7 Investments in intangible assets and property, plant and equipment

The table below provides a breakdown of the investments in intangible assets and property, plant and equipment presented in the cash flow statement:

(in millions of euros)	2020	2019*
Acquisitions of intangible assets	(1,446)	(1,380)
Acquisitions of property, plant and equipment	(15,086)	(15,514)
Change in payables to suppliers of fixed assets	525	97
INVESTMENTS IN INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT	**(16,007)**	**(16,797)**

** Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

10.8 Impairment/reversals

Accounting principles and methods

At the year-end and at each interim reporting date, in application of IAS 36, the Group assesses whether there is an indication that an asset could have been significantly impaired. An impairment test is also carried out at least once a year on cash-generating units (CGUs) or groups of CGUs including an intangible asset with an indefinite useful life, or to which goodwill has been partly or totally allocated.

Impairment tests are carried out as follows:

- the Group measures any long-term asset impairment by comparing the carrying value of these assets and goodwill, grouped into CGUs where necessary, and their recoverable amount;
- CGUs are groups of homogeneous assets that generate identifiable independent cash flows. They reflect the way activities are managed in the Group: they may be subgroups when the activity is optimised across the whole subgroup, or CGUs formed by parts of subgroups corresponding to different types of activity that are managed separately (thermal generation, renewable energy production, services), or single assets;
- the recoverable value of these CGUs is the higher of fair value net of disposal costs, and value in use. When this recoverable value is lower than the carrying amount in the balance sheet, an amount equal to the difference is booked under the heading "Impairment". The loss is allocated first to goodwill, and any surplus to the other assets of the CGU concerned; impairment booked on goodwill is irreversible;
- fair value is the asset's potential sale price in a normal transaction between economic actors;
- value in use is calculated based on projected future cash flows:
  - over a horizon that is coherent with the asset's useful life and/or operating life,
  - for certain intangible assets with an indefinite useful life (such as brands), beyond the horizon that can be observed or modelled, a terminal value is determined by discounting to infinity a normative cash flow,
  - excluding development projects other than those that have been decided at the valuation date; and
  - discounted at a rate that reflects the risk profile of the asset or CGU;
- the discount rates used are based on the weighted average cost of capital (WACC) for each asset or group of assets concerned, determined by geographical area and by business segment under the CAPM. WACC is calculated after taxes;
- future cash flows are calculated on the basis of the best available information at the closing date:
  - for the first few years, the flows correspond to the Medium-Term Plan (MTP). Over the MTP horizon, energy and commodity prices are determined based on available forward prices, taking hedges into consideration,
  - beyond the MTP horizon, cash flows are estimated based on long-term assumptions prepared for each country and each energy, within the framework of a scriptwriting process updated annually. Medium and long-term electricity prices are constructed analytically by assembling blocks of assumptions, *e.g.* economic growth, commodity prices (oil, gas, coal) and CO_2, demand for electricity, interconnections, and developments in the energy mix (rise of renewable energies, installed nuclear capacity, etc.) with fundamental models of supply-demand balance. The Group refers in particular to external analyses for each assumption object (for example, for commodities and CO_2, which are primary factors in electricity prices, the Group compares its own scenarios with scenarios developed by organisations such as the AIE, IHS, Wood Mackenzie or Aurora, bearing in mind that each of these analysts itself proposes a cone of scenarios corresponding to different macro-economic environments);
- income from capacity market mechanisms is also taken into consideration in valuing generation assets, starting from the MTP horizon where relevant, provided the countries concerned have introduced or announced the future introduction of a capacity revenue mechanism.

These calculations may be influenced by several variables:

- changes in discount rates;
- changes in market prices for energy and commodities and tariff regulations;
- changes in demand and the Group's market share, and the attrition rate on customer portfolios;
- the useful life of facilities, or the duration of concession agreements where relevant;
- the growth rates used beyond the medium-term plans and where relevant the terminal values taken into consideration.

10.8.1 Impairment by category of asset

Details of impairment recognised and reversed are as follows:

(in millions of euros)	*Notes*	2020	2019*
Impairment of goodwill	*10.1*	(31)	(57)
Impairment of other intangible assets	*10.2*	(85)	(47)
Impairment of tangible assets	*10.3-10.5*	(683)	(299)
IMPAIRMENT NET OF REVERSALS		**(799)**	**(403)**

** Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

Impairment recognised at 31 December 2019 amounted to €(403) million and concerned:

- thermal assets in the United Kingdom (€127 million);
- various CGUs of Dalkia, particularly in Poland (€105 million);
- various CGUs of EDF Renewables, notably goodwill impairment for a German entity (€49 million);
- hydropower assets (€33 million) and energy service assets (€27 million) owned by Edison in Italy; and
- other assets (total €62 million), including €24 million of projects stopped in France.

Impairment of €73 million was also booked at 31 December 2019 in respect of associates (see note 12).

Impairment recognised in 2020 amounts to €799 million. Details are given below.

10.8.2 Impairment test on goodwill, intangible assets and property, plant and equipment

The following tables present the results of impairment tests carried out on the main goodwill, intangible assets with indefinite useful lives and other Group assets in 2020, and some of the key assumptions used.

For application of IFRS 16 at 1 January 2019, where relevant the Group adapted the impairment test methodology as appropriate to the specific features of each CGU.

IMPAIRMENT OF GOODWILL AND INTANGIBLE ASSETS WITH INDEFINITE USEFUL LIVES

Operating segment	Cash-Generating Unit or asset	Net book value *(in millions of euros)*	WACC after tax	Growth rate to infinity	Impairment 2020 *(in millions of euros)*
United Kingdom	EDF Energy goodwill	7,569	6.0%	- [1]	-
Italy	Edison brand	945	6.5%	2.0%	-
	Framatome goodwill	1,332	6.1%	0.5%	-
Framatome	Framatome brand	151	6.1%	0.5%	-
	Dalkia goodwill	547	4.3%	1.4%	-
	Goodwill of DES Groom an engineering subsidiary in the US [2]	26	6.1%	1.5%	(26)
Dalkia	Dalkia brand	141	4.3%	1.4%	-
Other impairment					(5)
IMPAIRMENT OF GOODWILL AND INTANGIBLE ASSETS WITH INDEFINITE USEFUL LIVES					**(31)**

(1) The impairment test of EDF Energy goodwill covers the useful life of industrial assets, with no projection to infinity.
(2) Impairment booked at 30 June 2020.

IMPAIRMENT OF OTHER INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT

Operating segment	Cash-Generating Unit or asset	Impairment indicators	WACC after tax	Impairment 2020 *(in millions of euros)*
United Kingdom	Nuclear assets*	Decrease in market prices and early shutdowns of certain AGR units/lower production forecasts	6.0%	(621)
	Gas storage assets	Regulatory investments in certain fully-depreciated plants	5.4%	(13)
Italy	Hydropower assets*	Unfavourable change in regulations on hydropower concessions	6.5%	(39)
	Energy services*	Lower profitability on certain contracts	6.5%	(27)
EDF Renewables	Some CGUs	Unfavourable tariff prospects	3.4%-6.6%	(36)
Other impairment				(32)
IMPAIRMENT OF OTHER INTANGIBLE ASSETS AND PROPERTY, PLANT AND EQUIPMENT				**(768)**

* *Impairment mainly booked at 30 June 2020.*

General assumptions

In view of the specific context resulting from the Covid-19 pandemic, at the half-year 2020 closing a specific approach was adopted to take account of macro-economic conditions (discount rates), changes in market prices for commodities and electricity, the initial orientations resulting from adjustment of the Medium-Term Plan, and the specific situation of certain Group entities. This led to recognition of a total €738 million of impairment at 30 June 2020.

At 31 December 2020, the Group applied its usual method for impairment testing, updating the annual tests for goodwill and intangible assets, including those tested at 30 June 2020.

Electricity prices

Over the market horizon, the forward prices used in the impairment tests are the market prices observed at the year-end, which were substantially lower than at the 2019 year-end.

Over the long-term horizon, these tests consider price curves constructed analytically by assembling blocks of assumptions and fundamental models of the supply-demand balance, in an annually updated scenario-building process.

The long-term price curves in the 2020 scenario are lower at the start of the horizon (2024-2030) than in the 2019 scenario, with a loss of value in non-peak electricity supplies in the four principal countries (France, the UK, Italy and Belgium), as anticipated in the interim tests conducted at 30 June 2020. They are then higher than in the 2019 scenario in most countries over the following period (2030-2040). There are several explanatory factors for this pattern:

- the long-term price of fossil commodities, especially gas prices in Europe, declined between the two scenarios due to an upward adjustment to assumptions of LNG supply (as many new LNG plant projects have been announced in several parts of the world), plentiful resources at durably low prices in the United States (non-conventional gas and associated gas), and falling demand in Europe over the whole horizon reflecting the effect of energy efficiency policies and the expansion of renewable energies;
- meanwhile, the price trajectory of CO_2 quotas in the ETS (EU Emissions Trading System) was adjusted upwards in view of the European Union's plans for tougher commitments to achieve a substantial reduction in greenhouse gas emissions, particularly concerning targets for the years 2030 and 2050;
- updated assumptions regarding supply and demand for electricity, showing a downturn in demand for electricity in the medium term (due to higher energy efficiency, and to a lesser extent lower prices for gas supplied in Europe). This trend self-corrects over the longer term, with demand rising in line with the growth in electric vehicles and electrolytic hydrogen.

As these assumptions are crucial in determining recoverable value, sensitivity analyses are conducted on long-term price curves when impairment tests are carried out. The information disclosed about the sensitivity of recoverable value to electricity prices remains appropriate in the current context: the effects of the Covid-19 pandemic are expected to be limited after 2025, and reference is made to forward prices that capture the effects on short-term growth.

Regarding the assumptions concerning capacity mechanisms, capacity revenue is expected to be slightly higher than in the 2019 scenario in most European countries, due to the downward revision of the return on the most recent generation assets on the electricity sales market, particularly in connection with upward revision of CO_2 prices. This structural trend also concerns France, but with a time lapse. With the new capacities set to arrive in France between now and 2025 (particularly the Flamanville EPR, the Landivisiau CCG plant, and France's first offshore wind farm), the French electricity system will regain some room for manoeuvre, and this will bring capacity prices down.

Discount rates

The discount rates used in these tests are higher than at 31 December 2019 for most core European countries, to reflect EDF's broader financing spread combined with an increase in the market risk premium. However, the increase is more moderate than at 30 June 2020, due to revision of the financing spread and to take account of the lower risk-free rates. In the United Kingdom, the change in the income tax rate leads to a stability of the discount rate compared to 31 December 2019. In Italy, the sovereign risk premium was raised at 30 June 2020 due to the specific national context, and remains higher at the year-end than in 2019 because of volatility, resulting in a more pronounced increase in WACC. The year-on-year increase in the principal WACC rates used in the tests is around 10 to 20bp for France and Belgium and 40bp for Italy. The test results have been subjected to analyses of their sensitivity to the discount rate.

At 31 December 2020, the great majority of the Group's assets are impacted by the macro-economic context presented earlier. The possible consequences in terms of impairment were already broadly identified for the half-year closing at 30 June 2020.

United Kingdom – EDF Energy

Thermal assets

Significant amounts of impairment have been booked in recent years in respect of the Group's thermal assets in England, notably reducing the net book value of coal-fired plants and gas storage facilities practically to zero. The necessary investments for the Hole House and Hill Top gas storage site were totally written off at 31 December 2019, for a cost of €(13) million. Regarding coal-fired facilities, closure of the West Burton A plant is still expected in the short term.

For the West Burton B CCGT plant, the updated impairment test benefited from a more favourable estimation of spark spreads over the entire horizon than at the end of 2019. Nonetheless, given the past impairment booked on this asset since it began operation in 2013, the headroom calculated by the 2020 year-end impairment test did not lead to any reversal of impairment. The value of West Burton B is indeed sensitive to price variations, thus a 5% change in spark spreads would have an impact of approximately 5% on its recoverable value.

Sales and Supply segment

Long-term margin assumptions were revised downwards in view of the Covid-19 pandemic, particularly for the BtoB segment, as the margins defined for the BtoC segment already reflected the competitive and regulatory situation on the British market, particularly the end of the cap on the Standard Variable Tariff in 2023. The impairment test was updated based on these revised assumptions, and showed a recoverable value that had decreased by some 40% compared to 31 December 2019 and 20% compared to 30 June 2020, but remained higher than the book value tested. Sensitivity analyses were conducted with larger reductions in long-term margins and losses of market share, and indicated no risk of loss of value. The values of the assets contained in this CGU are non-material.

Nuclear assets (plants in operation)

The recoverable value of existing nuclear assets (8 reactors: 7 Advanced Gas-cooled Reactors (AGRs) and one Pressurised Water Reactor (PWR)) is determined by discounting future cash flows over the assets' useful life, assuming a 20-year extension for the Sizewell B PWR plant, in line with Group strategy. The updated impairment test for the 2020 year-end incorporates the early shutdown decisions concerning Hunterston, to be closed no later than 7 January 2022, and Hinkley Point B, to be closed in July 2022. These decisions were announced by the Group on 27 August 2020 and 19 November 2020 respectively.

The test conducted at 30 June 2020 included lower nuclear output estimates for 2021 and 2022, intended to capture recent difficulties affecting generation and the risk of unscheduled outages and delays in bringing reactors back online during those two years. The updated nuclear output assumptions combined with the impact of declining electricity prices, in both the medium term and the long term, led to recognition of impairment of £552 million, or €621 million.

The updated impairment test at 31 December 2020 incorporates the early shutdown decisions concerning the Hunterston and Hinkley Point B plants. Following the test results, the impairment recorded at 30 June is maintained.

The recoverable value of nuclear assets is sensitive to price assumptions: a +/-2% difference over the entire horizon of the scenario used for the impairment test at 31 December 2020 would have an impact of+/-£260 million. The nuclear output assumptions used also have a notable influence on the calculation: a +/-3% revision to prospects over the entire horizon would result in a variation of +/-£400 million in the recoverable value. In addition, a 50bp increase in the discount rate would lead to additional impairment of around £300 million.

Goodwill

EDF Energy's goodwill amounted to €7.6 billion (or £6.7 billion) at 31 December 2020 and mainly results from the takeover of British Energy in 2009.

The recoverable value of EDF Energy is determined by discounting future cash flows over the assets' useful life, taking into consideration the two EPRs with a 60-year useful life currently under construction at the Hinkley Point site, a project for which the final contracts were signed on 29 September 2016. Future cash flows from these plants are determined by reference to the Contract for Difference (CfD) between the Group and the UK government. The CfD sets stable, predictable prices for EDF Energy for a period of 35 years from the date the two EPRs are first commissioned: if market prices fall below the CfD exercise price, EDF Energy will receive an additional payment. The CfD exercise price for HPC is set at $£_{2012}$92.50/MWh and is indexed on UK inflation *via* the consumer price index (CPI). Thus, for the operation period under a CfD, future cash flows include a long-term inflation assumption. For the 25 years of operation after the CfD period, for which no forecasts exist for long-term UK electricity market prices, future cash flows include a very long-term inflation assumption to determine electricity market prices, starting from the final year of cash flows valued on the basis of the CfD.

The impairment test at 31 December 2020 incorporates the latest estimates of the Hinkley Point C (HPC) project costs announced on 27 January 2021, *i.e.* total project completion costs (excluding borrowing costs and exchange rate effects compared to the project's benchmark rate of £1 = €1.23) of an estimated £22-23 billion (in 2015 sterling), instead of the estimate of £21.5-22.5 billion (in 2015 sterling) from the previous cost revision of September 2019, and deferral of the delivery of reactor 1 to mid-2026. The range will depend on the effectiveness of action plans to be delivered in partnership with contractors, as the impairment test results lie in the middle of the range. The additional costs result from the detailed review of the costs and schedule, taking account of the impacts of the Covid-19 pandemic as currently assessed. EDF's projected rate of return (IRR) is now estimated at between 7.1% and 7.2% (compared to 7.6%-7.8% in the previous review).

On this revised basis and in view of the unfavourable effects on the recoverable value of existing nuclear assets and the sales and supply segment explained above, there is still significant headroom between the recoverable value and the book value of EDF Energy at 31 December 2020. Sensitivity analyses on the WACC show that a 50bp increase in WACC would not result in a risk of impairment.

For HPC, the latest project review on 27 January 2021 confirmed the risk of deferral of the Commercial Operation Date (COD), estimated at 15 months for Unit 1 and 9 months for Unit 2, entailing a potential additional cost of around £0.7 billion (in 2015 sterling) which would reduce the IRR for EDF by around 0.3%. This risk of deferral and the associated additional cost would reduce the impairment headroom resulting from the EDF Energy test by approximately 30%.

Sensitivity analyses were also conducted for information purposes using extremely pessimistic assumptions: for example, it was estimated that a further 3-year deferral of the COD and an associated additional cost of £3 billion would lead to a threshold value for the goodwill impairment headroom, all other things being equal.

Additional sensitivity analyses were conducted on the long-term inflation assumptions adopted for HPC revenue over the term of the CfD and beyond. They did not show any risk of impairment, all other things being equal.

Finally, although Brexit has no immediate impact on impairment tests of EDF Energy's assets since most cash flows (income, costs, investments) and assets are stated in pounds sterling, the longer-term consequences are still hard to predict. The Group will monitor movements in the rates of return demanded by investors and changes in fuel prices, CO_2 prices and macro-economic data such as GDP growth, which could affect price curves.

Italy – Edison

As an intangible asset with an indefinite useful life, the impairment test of the Edison brand, first recognised at the value of €945 million when Edison was taken over in 2012, is updated annually using the royalty relief method and a 100bp risk premium for determining the discount rate. In view of the macro-economic situation at 30 June 2020, the test was updated and indicated a loss of recoverable value, essentially due to the higher WACC, without leading to recognition of impairment. This test was updated at 31 December 2020 under the usual approach, and the results confirmed the absence of impairment. An external assessment of the Edison brand value performed in 2020 has also concluded that the value in use is higher than its net book value. However, sensitivity analyses show a risk of loss of value of about €55 million in the event of a 50bp increase in the WACC.

Concerning hydropower assets, the impairment test was updated at 30 June 2020, incorporating lower forward prices and the rise in WACC in Italy, and this led to recognition of impairment of €(39) million. The updated test at 31 December 2020 has not identified any additional risk. A 50bp increase in the WACC would lead to recognition of around €(15) million of additional impairment. A 5% decrease in prices over the entire horizon would have a similar result.

In energy services, impairment of €(27) million, including €(23) millions at 30 June 2020, was recorded on the Edison Facility Solution assets at 30 June 2020, mainly as a result of lower profitability prospects on certain contracts.

The decline in the recoverable value of wind power assets observed at 30 June 2020, principally due to revised price scenarios, was confirmed at the year-end and amounts to around 10% compared to 31 December 2019, although there is still a significant headroom. These test conclusions were not affected by analyses of sensitivity to the WACC (a 50bp increase) and price variations (a 5% decrease).

Thermal assets benefit from high-return investments due to construction of the new-generation CCGTs at Marghera and Presenzano which have respective capacities of 780MW and 760MW and low environmental impact (carbon emissions are 40% below the national average, and NO_x emissions are reduced by 70%) and should begin generating energy in 2022 and 2023 respectively. Sensitivity analyses were conducted on these assets, and the results show that a 10% decrease in clean spark spreads or a 50 base point increase in WACC would not entail any risk of impairment.

Finally, the Algerian E&P assets presented as continuing operations were subjected to an impairment test at 31 December 2020, particularly in view of the situation of commodity prices on the market. The value resulting from the test did not lead to recognition of any additional impairment.

Framatome

At 31 December 2020, the goodwill of Framatome amounted to €1,332 million, resulting from EDF's acquisition of 75.5% of the capital of Framatome on 31 December 2017. The Group finalised recognition of the business combination in its financial statements at 31 December 2018.

The recoverable value of Framatome was determined on the basis of a 10-year business plan and a terminal value. This business plan is sensitive to assumptions concerning the completion of major construction projects that are incorporated into the reactor scenario, and market share assumptions for services to the installed base and fuel deliveries to customers' reactors. The WACC applied in discounting future cash flows is weighted to reflect Framatome's different businesses depending on their risk profile. The headroom indicated by the impairment test remains very significant, but the updated test at 31 December 2020 shows a lower recoverable value than at 31 December 2019, principally due to the higher WACC.

Sensitivity analyses were conducted using a 50bp increase in WACC and a 0% growth rate to infinity. The test conclusions were not affected.

Framatome's intangible assets recognised after its acquisition (technologies, including the EPR, which are depreciated over an average 15 to 20 years; customer relations amortised over an average period of 11 years; and the brand) were tested and no risk of impairment was identified.

EDF Renewables

EDF Renewables' assets mainly consist of CGUs benefiting from Price Purchase Agreements (PPAs) providing contractually defined revenues over most of the assets' useful lives, and consequently have low market risk exposure.

During 2020, impairment of €(36) million was recognised in respect of various CGUs of EDF Renewables. This amount includes €(21) million of impairment concerning a wind farm in the United States that is in the process of being sold, for a price expected to be lower than the value of the assets. The rest concerns specific assets.

Besides the French Finance Law for 2021, published in the *Journal officiel* on 30 December 2020, introduces a reduction in purchase tariffs for solar power supplied under certain contracts signed between 2006 and 2010. EDF Renewables is the exclusive or joint owner of solar power plants concerned by this potential tariff revision, with total capacity of 145MW. The modalities for application of these measures will be set out in a Council of State decree to be issued after the CRE has given its opinion. This publication date of this decree is yet unknown and in the meantime no risk of impairment can currently be estimated.

Dalkia

At 31 December 2020, Dalkia's goodwill amounts to €547 million, principally resulting from acquisition of the Dalkia group in France under the agreement of 25 March 2014 with Veolia Environment.

The recoverable value of the Dalkia group is based on future cash flows projected over a medium-term horizon, and a terminal value that represents cash flow projections to infinity. The impairment test conducted at 30 June 2020 showed a decrease in the recoverable value attributable to the macro-economic situation. The updated test at 31 December 2020 benefited from improvements in certain parameters since 30 June 2020, particularly the discount rate, but also the favourable impact of lower generation taxes introduced in France's economic recovery plan. Under the revised assumptions, the recoverable value of Dalkia is nearly back to its level at 31 December 2019 and remains very much higher than its value to be tested. The key parameters of the test are the terminal value, and the discount rate: both were subjected to sensitivity analyses and the results did not contradict the headroom between the book value and recoverable value.

The Dalkia brand, which was recognised as an asset when the Group took control of Dalkia in 2014 at the value of €141 million, is estimated by the royalty relief method. The updated impairment test at 31 December 2020 supports its current book value.

In view of the impacts of the Covid-19 pandemic on engineering subsidiaries, tests of specific assets were conducted at 30 June 2020, leading to recognition of €(26) million of impairment on the goodwill booked following acquisition of a subsidiary in the United States. A test was also conducted on the subsidiary Imtech in the United Kingdom in view of the substantial losses of that CGU in 2020, but did not indicate any loss of value. Threshold value analyses were conducted to verify the robustness of this result with respect to the parameters applied.

France – Generation and Supply

Due to the integrated management and interdependence of the different generation facilities that make up the French fleet (nuclear, thermal and hydropower plants), independently of their maximum technical capacities, the Group considers the entire fleet as a single CGU. This CGU does not include any goodwill.

Even when there is no indication of any loss of value, an impairment test is performed due to the highly significant value of this CGU in the Group's financial statements and its substantial exposure to market prices since the "yellow" and "green" regulated tariffs were discontinued on 1 January 2016.

The recoverable value of the generation fleet is estimated by discounting future cash flows under the Group's usual methodology, described in the accounting policies, over the assets' useful life, using an after-tax WACC of 5.2% at 31 December 2020. For nuclear assets currently in operation, the Group's benchmark model assumes that the useful life is 50 years, in line with its industrial strategy. It also incorporates the proposals for early shutdown of two 900MW nuclear reactors, as set out in France's multi-year energy plan.

The impairment test takes into consideration the latest forecasts concerning Flamanville 3 dating from late 2019, which adjusted the project schedule, setting the fuel loading date in late 2022, and revised the estimated construction cost to €12.4 billion in $euros_{2015}$, excluding borrowing costs, an increase of €1.5 billion from the previous estimate mainly caused by exceptional additional costs for repairing penetration welds. The test assumes that these unusual costs will be included in other operating income and expenses rather than being capitalised.

The year-end impairment test, like the test at 30 June 2020, indicates that the recoverable value is lower than at 31 December 2019, but the headroom over the book value remains significant. As well as the unfavourable macro-economic environment (long-term and medium-term price scenarios, WACC), calculation of the recoverable value notably includes revised assumptions for electricity output and the higher cost of the *Grand Carénage* programme (particularly as a result of the Covid-19 pandemic), in line with Group announcements, and conversely the favourable effects of the national recovery plan on generation taxes.

The key assumptions in the test still concern the useful life of nuclear assets, the long-term price scenario, the discount rate, changes in costs and investments, and the capacity revenue. Each of these assumptions was subjected to sensitivity analyses and the results did not call into question the existence of a positive difference between the book value and recoverable value.

Other International – Belgium

The updated impairment test at the year-end showed that the recoverable value is higher than the book value. The loss of value indicated at 30 June based on electricity price scenarios and a projected decline in the customer portfolio was counterbalanced by an improvement in wind power asset value due to expanded capacities.

For tests of the nuclear plants operated by the ENGIE Group in which Luminus owns a 10.2% share (419MW), it has historically been assumed that operations will continue until 2025 at the latest depending on the plants.

Sensitivity analyses are conducted to incorporate the risk that the hydropower concessions may be shortened, and no associated risk of impairment has been identified.

Finally, impairment of €(189) million was recognised in respect of associates at 31 December 2020, concerning coal-fired plants in China, Framatome's investments in entities operating in sectors greatly impacted by the Covid-19 pandemic, and certain unlisted assets owned by EDF SA (EDF Invest) included in dedicated assets (see note 15.1.2).

Note 11 French public electricity distribution concessions

Accounting principles and methods

The accounting treatment of public distribution electricity concessions in France is determined by the concession agreements, with particular reference to their special clauses. It takes into consideration the possibility that the EDF group, particularly Enedis, may one day lose its status as the sole authorised State concession operator.

In application of the concession agreements, the concession operator manages the facilities at its own risk for the entire term of the concession, and bears substantially all the risks and benefits (both technical and economic) over the useful life of the network infrastructure. Under IAS 16, the assets are controlled by the operator and the grantors have no decisive characteristics of control over the infrastructures as defined by IFRIC 12.

All concession assets are consequently carried in the balance sheet, regardless of their origin (facilities constructed or purchased by the concession operators, and facilities provided by the concession grantors) and the source of financing, while the contractual obligations to the grantor are recognised in the liabilities.

Public electricity distribution facilities that are constructed or purchased by the concession operator are carried at production or acquisition cost:

- purchased facilities are initially recognised at real acquisition cost including directly attributable expenses incurred to make the asset ready for use;
- the production cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction of the asset, whether incurred directly by the Company or invoiced by third parties.

New facilities provided by the concession grantors are carried at the value of the cost the Company would have borne if it had constructed them itself.

In the specific case of rising mains transferred for no consideration to the public distribution network in application of Article 176 of French law 2018-1021 of 2 November 2018 on housing, development and digital affairs (the "ELAN" law), these assets are carried at their market value under Article 213 of France's national chart of accounts.

Balance sheet liabilities are recognised in respect of new facilities provided for no consideration by the concession grantors and the rising mains transferred under the ELAN law.

Distribution assets (pipes, substations) are depreciated over periods of 30 to 60 years, meters and metering equipment over periods of 20 to 30 years. The Group regularly checks the relevance of the main accounting parameters for concession assets (depreciation periods, replacement values, management levels).

Regulations governing distribution concessions in France

Since the enactment of the French Law of 8 April 1946, EDF, and subsequently Enedis, has been the concession operator of most of the public distribution networks in France.

SEI is the concession operator for distribution network zones that are not interconnected with the network in mainland France, under identical concession regulations to Enedis.

Électricité de Strasbourg is the concession operator for public distribution networks in a limited zone depending on a non-nationalised distributor, in application of the Law of 8 April 1946.

In accordance with France's Energy Code and Local Authorities Code, the public distribution of electricity is principally operated under the public service concessions system. The authorities granting the concessions (local authorities or public establishments for cooperation acting as an Energy Distribution Organisation Authority, Autorité organisatrice de la distribution d'énergie – AODE) organise the public electricity distribution service through concession agreements with specifications that define the respective rights and obligations of the parties. Enedis distributes electricity to 95% of the population of mainland France under such concessions, with 421 concession agreements at 31 December 2020. The other 5% are served by Local Distribution Companies (including Électricité de Strasbourg).

Concession agreement models

Enedis' concession agreements correspond to different models depending on the date of signature.

1992 concession agreement model

The 1992 concession specifications model (updated in 2007) was negotiated with the FNCCR (National Federation of licensing authorities) and EDF, and approved by the public authorities. This model places Enedis under an obligation to record industrial depreciation and establish provisions for replacement.

2017 concession agreement model

On 21 December 2017, the FNCCR, France Urbaine, EDF and Enedis signed a framework agreement for a new concession agreement model. This new model modernises the relationship between Enedis and concession-granting authorities in the long term and reflects the parties' attachment to the principles of French concessions for electricity distribution: public service, regional solidarity and national optimisation. The FNCCR and France Urbaine represent the concession-granting authorities, particularly towns, syndicated municipalities, boroughs and major cities when they are the authorities with competence to grant public electricity distribution concessions.

As of 2018, newly-signed concession agreements apply the concession agreement model validated on 21 December 2017. At the effective date of a new agreement, the existing special concession liabilities recorded in application of the previous concession agreement to represent the concession-granting authority's rights in the concession assets remain in the accounts. Like earlier concession agreements signed since 2011, the contractual obligation to establish provisions for replacement no longer exists, and the governance of investments is different.

To provide an effective public service, the distribution network operator and the concession-granting authority now agree to jointly set up a governance system to oversee investments in the public electricity distribution network over the area covered by the concession, including replacement of infrastructures. This system mainly takes the form of a master plan taking a long-term view of developments in the network over the concession area, and multi-year investment plans (*programmes pluriannuels d'investissements* – PPIs) for 4 and 5-year periods that are medium-term applications of the master plan.

PPIs contain detailed objectives for each investment purpose, concerning a selection of quantified, localised investments with financial valuations for the duration of the plan.

PPIs are revised when necessary, after consulting with Enedis and the authority granting the concession, to take account of changes in each party's investment priorities and financial resources.

If it were observed at the end of a PPI that any investment concerned by Enedis' financial commitment had not been made, the concession-granting authority could oblige Enedis to deposit a sum equal to 7% of the investments still to be made. This deposit would then be returned or retained after a two-year period, depending on the investments made by that time.

In accordance with the agreement reached in late 2017 with the FNCCR and France Urbaine, negotiations for concession renewals continued in the regions of France during 2020. By the end of the year, 240 concession agreements had been concluded under the new model validated in December 2017, for local projects with major cities, urban boroughs, syndicated counties or municipalities, and towns or villages. More than two thirds of concession agreements with major cities and urban boroughs have already been renewed under the new model, in addition to the 42 previously renewed or amended concessions that contain stipulations similar to the new model. The aim is to continue negotiations with the concession-granting authorities with a view to ensuring that almost all concessions using the old agreement model are renewed by the end of 2021.

11.1 Property, plant and equipment operated under French public electricity distribution concessions

(in millions of euros)	31/12/2019	Increases [1]	Decreases	Other movements [2]	31/12/2020
Land and buildings	3,061	177	(18)	(1)	3,219
Networks	96,970	4,383	(465)	11	100,899
Other installations, plant, machinery, equipment & other	4,624	466	(218)	-	4,872
Assets in progress [3]	1,880	(56)	(1)	5	1,828
Gross value	**106,535**	**4,970**	**(702)**	**15**	**110,818**
Land and buildings	(1,523)	(74)	15	(10)	(1,592)
Networks	(43,724)	(234)	361	(2,276)	(45,873)
Other installations, plant, machinery, equipment & other	(2,875)	(210)	204	(120)	(3,001)
Depreciation and impairment	**(48,122)**	**(518)**	**580**	**(2,406)**	**(50,466)**
NET VALUE	**58,413**	**4,452**	**(122)**	**(2,391)**	**60,352**

(1) Increases also include facilities provided by the concession-granting authorities. In 2020 they include €399 million resulting from incorporation of the rising mains in application of the ELAN law.

(2) Other movements mainly concern depreciation of assets operated under concessions, booked against amortization recorded in the special concession liability accounts.

(3) Increases in assets in progress are stated net of the effects of newly-commissioned assets.

11.2 Special French public electricity distribution concession liabilities

Accounting principles and methods

Concession liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, and comprise the following:

- the concession-granting authority's rights in existing assets (its right to recover all the concession assets), consisting of the value in kind of the facilities (the net book value of assets operated under concessions), less any as yet unamortised financing provided by the operator;
- the concession-granting authority's rights in assets to be replaced (the operator's obligations relating to assets due for replacement):
  - amortisation of financing by the grantor: this is a liability owed by the concession operator to the grantor and is recognised progressively as the asset is used,
  - provision for replacement: this provision exclusively concerns assets due for replacement before the end of concessions using the 1992 concession agreement model, except for the rising mains transferred in application of the ELAN law. It is accrued over the asset's useful life, based on the difference between the asset's replacement value for identical capacity and functions, and the original value. The replacement value is adjusted at each year-end based on indexes from official publications, and the impact of the adjustment is spread over the residual useful life of the assets concerned.

When assets are replaced, amortisation recognised on the portion of assets considered to be financed by the grantor, and the provision for replacement established for the relevant asset, are cancelled and transferred to rights in existing assets. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's replacement to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

The Group considers that the obligations related to assets to be replaced are to be valued on the basis of the special clauses contained in the concession agreements. Under this approach, these obligations are stated at the value of the contractual obligations as calculated and reported annually in the reports to the grantors. This contractual value also reflects the possibility that the EDF group may one day lose its status as the concession operator.

The changes in special concession liabilities for existing assets and assets to be replaced are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Value in kind of assets*	52,907	51,085
Unamortised financing by the operator	(28,730)	(27,387)
Rights in existing assets – net value	**24,177**	**23,698**
Amortisation of financing by the grantor	15,000	14,389
Provisions for replacement	9,243	9,378
Rights in assets to be replaced	**24,243**	**23,767**
SPECIAL FRENCH PUBLIC ELECTRICITY DISTRIBUTION CONCESSION LIABILITIES	**48,420**	**47,465**

* *Including contributions received to finance concession assets, amounting to €108 million (€131 million in 2019). In 2020 they include €399 million resulting from incorporation of the rising mains in application of the ELAN law.*

Note 12 Investments in associates and joint ventures

Investments in associates and joint ventures are as follows:

		31/12/2020			31/12/2019	
(in millions of euros)	*Notes*	Ownership %	Share of net equity	Share of net income	Share of net equity	Share of net income
Principal investments in associates						
CTE	*12.1*	50.10	1,378	237	1,417	308
Taishan (TNPJVC)*	*12.2*	30.00	n.c.	n.c.	1,165	13
Other investments held by EDF SA	*12.3*	n.a	1,742	-	1,448	59
Investments held by EDF Renewables	*12.3*	n.a	1,198	70	1,063	77
Other investments in associates and joint ventures	*12.3*	n.a	n.c.	n.c.	1,321	62
Subtotal			**6,794**	**362**	**6,414**	**519**
CENG (reclassified as assets held for sale)	*3.2*	49.99	n.a.	63	n.a	288
Alpiq (sold on 28 May 2019)	*3.1.2*	n.a	n.a.	n.a	n.a	11
Subtotal				**63**		**299**
TOTAL			**6,794**	**425**	**6,414**	**818**

n.a = not applicable. n.c. = not communicated.

* *The financial data for Taishan at 31 December 2020 are not reported in this table as CGN (Taishan's parent company) publishes its consolidated financial statements later than the Group.*

12.1 Coentreprise de Transport d'Électricité (CTE)

The key financial indicators for the CTE subgroup (on a 100% basis) are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Non-current assets	19,202	18,568
Current assets	3,712	3,120
TOTAL ASSETS	**22,914**	**21,688**
Equity	2,750	2,829
Non-current liabilities	15,630	15,059
Current liabilities	4,534	3,800
TOTAL EQUITY AND LIABILITIES	**22,914**	**21,688**
Sales	4,729	4,856
Operating profit before depreciation and amortisation	1,914	2,181
Net income	**473**	**615**
Net indebtedness	12,700	12,256
Gains and losses recorded directly in equity	(188)	(279)
Dividends paid	367	313

CTE's affiliate, RTE (Réseau de Transport d'Électricité), is responsible for managing the high voltage and very high voltage public electricity transmission network. Enedis uses RTE's network to convey energy to the distribution network.

12.2 Taishan

12.2.1 Taishan financial indicators

The key financial indicators published for Taishan (on a 100% basis) are as follows:

(in millions of euros)	31/12/2019	31/12/2018
Non-current assets	12,183	11,595
Current assets	618	451
TOTAL ASSETS	**12,801**	**12,046**
Equity	3,882	3,279
Non-current liabilities	7,467	7,777
Current liabilities	1,452	990
TOTAL EQUITY AND LIABILITIES	**12,801**	**12,046**
Sales	783	32
Net income	**44**	**(8)**
Dividends paid	-	-

12.2.2 Transactions between the EDF group and Taishan

EDF owns 30% of Taishan Nuclear Power Joint Venture Company Limited (TNPJVC), which was set up to build and operate two EPR nuclear reactors in Taishan, in the province of Guangdong in China. Comprising two 1750-MW EPR reactors, Taishan nuclear power plant is the biggest cooperation project between China and France in the energy sector. CGN holds a 51% stake and Yudean a 19% stake.

Following the start of commercial operation by the first reactor on 13 December 2018, the second reactor began commercial operation on 7 September 2019. 2020 saw the first shutdown for refuelling of Taishan 1, from 29 June to 24 September 2020.

On 20 March 2019, the NDRC (National Development and Reform Commission) attributed regulated tariffs to the first three 3rd-generation nuclear projects in China, one of which is Taishan. The tariff attributed to Taishan was set at RMB435/MWh until the end of 2021, with retroactive effect to the date the first unit was commissioned (13 December 2018). Indexing mechanisms for the post-2021 tariffs were not set out in this decision and are not currently known. The impairment test at 31 December 2020 was updated to take account of the uncertainties over tariff levels and certain operating assumptions which were adjusted following the operations of 2020. The results confirmed the absence of impairment on the investment as stated in the financial statements at 31 December 2020.

12.3 Other investments in associates and joint ventures

The other investments held by EDF SA are included in dedicated assets (see note 15.1.2).

The other investments held by EDF Renewables are mainly located in the United States, Europe, China and Brazil.

Other investments in associates and joint ventures principally concern:

- the dam owned by Compagnie Énergétique de Sinop (CES) in Brazil, 51%-owned by the Group: the first turbine was commissioned in September 2019 and the second in October 2019;
- the Nachtigal dam in Cameroon, 40%-owned by the Group: construction began in March 2019, with commissioning expected in early 2024;
- the supercritical coal-fired plant owned by Jiangxi Datang International Fuzhou Power Generation Company Ltd. in China, 49%-owned by the Group.

In 2020, €(189) million of impairment was booked in respect of investments in associates and joint ventures concerning various specific assets: certain coal-fired plants in China, investments held by Framatome in entities operating in sectors greatly impacted by the Covid-19 pandemic, and certain unlisted assets owned by EDF SA (EDF Invest) included in dedicated assets (see note 15.1.2).

In 2019, €(73) million of impairment was booked in respect of investments in associates and joint ventures, concerning various specific assets of non-significant individual amounts.

Developments in investments accounted for by the equity method owned by EDF Renewables in 2020

EDF Renewables – Jinko Power consortium reached the financial closing of the world's largest solar project and launched its construction in Abu Dhabi

On 22 December 2020, the consortium, formed by French **EDF group** subsidiary, **EDF Renewables** and Chinese **Jinko Power HK**, subsidiary of **Jinko Power Technology Co. Ltd.** have successfully reached the financial closing for the 2.1GW Al Dhafra PV2 solar project in Abu Dhabi, United Arab Emirates. This operation has been completed along with TAQA Group and Masdar, the Abu Dhabi-based shareholders and major players in the electricity and renewable sectors.

The approximately 1 billion USD transaction has been funded *via* project financing from a banking group.

Completion of this major milestone allows the mobilization on site and start of construction. Located in the region of Al Dhafra, 35 kilometres south of Abu Dhabi City, this solar photo-voltaic plant will be the largest single-site solar plant worldwide. The plant spans over 20 square kilometres of desert climate area, with more than 4 million PV modules.

Upon commissioning, targeted in 2022, this project will provide the equivalent electricity to power over 160,000 local households.

As the project is under an independent power producer model (IPP), EDF Renewables and Jinko Power hold respectively 20% of the shares, the remaining 60% is owned by TAQA and Masdar.

The four partners had previously signed the 30-years Power Purchase Agreement (PPA) on 23 July 2020.

EDEN Renewables India increases its portfolio with new solar photovoltaic power plants

On 1 October 2020, EDF Renewables and Total Eren, two world leaders in renewable energy, announced that EDEN Renewables India, their equally owned joint venture dedicated to the Indian solar photovoltaic market, had been awarded three solar photovoltaic (PV) projects for a total of 1,350MWp in Rajasthan, Northern India.

At 31 December 2020, EDEN Renewables confirmed its ambitions in India, with more than 1.2GW of wind and solar power projects in operation or construction.

EDEN Renewables also expanded its portfolio of projects, notably by winning the following projects between April and July 2020:

- two 450MWp[1] solar PV projects during the last tenders organised by the Solar Energy Corporation of India (SECI VIII and SECI IX);
- one 450MWp[1] solar PV project during the last tender organised by the National Hydro Power Corporation (NHPC), for which a 25-year Power Purchase Agreement (PPA) was signed with NHPC at the end of August 2020.

With expected output of more than 2,300GWh per year, these solar PV plants will generate the energy required to meet the annual electricity needs of nearly 2 million people in India.

Construction of the plants is due to start during the first half-year of 2021 and commissioning is expected in 2022-2023.

EDF Renewables, Enbridge and wpd start construction of the Fécamp offshore wind farm

On 2 June 2020, EDF Renewables, Enbridge Inc., a leading energy infrastructure company in North America, and wpd, a European renewable energy company, announced the start of construction for the Fécamp offshore wind farm following the finalisation of financing agreements between the consortium and its financial partners.

The 500MW Fécamp offshore wind farm will be composed of 71 wind turbines located between 13km and 22km from the coast of northwest France. Project commissioning is scheduled for 2024.

The total project capital cost is estimated at €2 billion, mostly to be financed through non-recourse project level debt. Fécamp offshore wind farm is underpinned by a 20-year power purchase agreement (PPA) granted by the French state in June 2018.

All the project partners possess considerable experience in offshore wind farms and in the delivery of large-scale industrial projects:

- **EDF Renewables**, which owns 35% of the project through Éolien Maritime France, brings its expertise in the development, construction and operation of renewable energy projects, including in the offshore wind sector;
- **Enbridge Inc.**, which owns 35% of the project through Éolien Maritime France, is a leading North American energy infrastructure company;
- **wpd offshore**, which owns 30% of the project, is one of the pioneers and leaders of offshore wind power.

Partnership between EDF and CEI groups for construction and operation of offshore wind power projects in China

On 2 June 2020, EDF and China Energy Investment Corporation (CEI) announced a new step in their industrial partnership through the conclusion of an agreement of the joint venture agreements for the Dongtai IV and V projects. The new joint venture is now building and operating 502MW of offshore wind power projects off the coast of Jiangsu Province (north of Shanghai), China.

The agreement concerns Dongtai IV, a 302MW wind farm fully commissioned in December 2019 and Dongtai V, a 200MW project now in construction and due to be commissioned in 2021. Together, the partners will continue the construction of the Dongtai V offshore wind farm and carry out operations and maintenance for both facilities. These projects are the EDF group's first offshore wind projects in China.

The Group has taken a 37.5% stake in the joint venture through its subsidiaries EDF Renewables and EDF (China) Holding Ltd., while CEI group continues to hold the rest of the capital through its subsidiaries Shenhua Renewable and Shenhua Clean Energy Holdings.

The joint venture is accounted for by the equity method in the Group's consolidated financial statements.

Changes in the scope of consolidation are presented in note 3.1.1, particularly the principal acquisitions in renewable energies in 2019.

Note 13 Working capital

13.1 Working capital: composition and change

13.1.1 Composition of working capital

Changes in net working capital during 2020 are as follows:

(in millions of euros)	*Notes*	31/12/2019	Monetary changes	Non-monetary changes	31/12/2020
Inventories and work-in-process	*13.2*	(14,049)	(873)	184	(14,738)
Trade receivables net of provisions	*13.3*	(15,606)	842	243	(14,521)
Trade payables	*13.4*	12,867	(861)	(106)	11,900
Compensation receivable for Public Energy Service charges (CSPE receivable)	*13.3.4*	(1,667)	(328)	2	(1,993)
Other receivables and payables [1]	*13.3.4 and 13.5*	9,379	(189)	361	9,551
Other components of working capital [2]		(726)	(270)	255	(740)
NET WORKING CAPITAL		**(9,802)**	**(1,679)**	**939**	**(10,541)**

(1) Excluding receivables and payables on acquisition/disposal of assets and investment subsidies.

(2) The other components of working capital includes CO_2 emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

(1) Equivalent to 300 MWac.

13.1.2 Non-monetary changes in working capital

Non-monetary changes include the effect of changes in the scope of consolidation, foreign exchange effects, changes in fair values and the effect of reclassifications. The variation in non-monetary changes compared to 2019 is principally due to a €320 million foreign exchange effect (particularly on inventories, trade receivables and trade payables due to the decline of the pound sterling against the Euro) and changes in the fair value of derivatives related to operations, amounting to €239 million.

13.1.3 Monetary changes in working capital

(in millions of euros)	***Notes***	**2020**	**2019** [(1)]
Change in inventories	*13.2*	(873)	191
Change in trade receivables	*13.3*	842	199
Change in trade payables	*13.4*	(861)	(48)
Change in the Compensation receivable for Public Energy Service charges (CSPE receivable)	*13.3.4*	(328)	(864)
Change in other receivables and payables [(2)]	*13.3.4 and 13.5*	(459)	997
CHANGE IN WORKING CAPITAL		**(1,679)**	**475**

(1) Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).

(2) The change in other receivables and payables includes monetary changes in CO_2 emission rights and green certificates presented in intangible assets in the balance sheet, and derivatives related to operations.

Monetary changes in working capital were down by €(1,679) million in 2020, principally due to the significant increase in inventories (rise in stocks of capacity certificates and energy savings certificates – see note 13.2) and changes in terminated positions and margin calls in the trading activity. These two factors also account for most of the difference in the change in working capital between 2019 and 2020.

13.2 Inventories

Accounting principles and methods

Inventories are recognised at the lower of acquisition cost or net realisable value, except for inventories held for trading activities, which are carried at market value. Inventories consumed are generally valued by the weighted average unit cost method.

Cost includes all direct materials costs, labour costs, and a share of indirect production costs.

Nuclear fuel

Inventory accounts include:

- nuclear materials, whatever their form during the fuel production cycle;
- and fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (*e.g.* fluoration, enrichment, fabrication, etc.).

In accordance with regulatory obligations specific to each country, inventories of fuel (new or not entirely consumed) may also comprise expenses for spent fuel management and long-term radioactive waste management, with corresponding provisions or debts in the liabilities, or full and final payments made when the fuel is loaded.

In France, in application of the concept of "loaded fuel" as defined in the ministerial order of 21 March 2007, the cost of inventories for fuel loaded in the reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

In compliance with IAS 23, interest expenses incurred in financing inventories of nuclear fuels are charged to expenses for the period provided these inventories are manufactured in large quantities on a repetitive basis.

Nuclear fuel consumption is determined by component (natural uranium, fluoration, enrichment, fuel assembly fabrication) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

Other inventories

Other inventories comprise:

- other fuels, comprising fossil fuels required for operation of fossil-fired power plants and gas stocks;
- other operating supplies, consisting of operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- goods and services in progress, particularly relating to the businesses of EDF Renewables, Dalkia and Framatome;
- other inventories, mainly consisting of certificates issued under the various environmental schemes (see notes 5.4.3 and 10.2) and capacity obligation mechanisms (capacity guarantees in France – see note 5.1).

Other non-trading operating inventories are generally valued at weighted average cost including direct and indirect purchasing costs.

Impairment of spare parts principally depends on the turnover of these parts.

The carrying value of inventories, broken down by nature, is as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	**Gross value**	**Provision**	**Net value**	**Gross value**	**Provision**	**Net value**
Nuclear fuel	10,564	(33)	10,531	10,649	(4)	10,645
Other fuel	770	(42)	728	872	(30)	842
Other supplies	1,660	(398)	1,262	1,624	(360)	1,264
Work-in-progress for production of goods and services	469	(33)	436	497	(30)	467
Other inventories	1,804	(23)	1,781	869	(38)	831
TOTAL INVENTORIES	**15,267**	**(529)**	**14,738**	**14,511**	**(462)**	**14,049**

The long-term portion (more than one year) mainly concerns nuclear fuel inventories amounting to €8,068 million at 31 December 2020 (€7,828 million at 31 December 2019).

The value of EDF Trading's inventories stated at market value is recognised in "Other fuel" and "Other inventories" and stands at €300 million at 31 December 2020 (€141 million at 31 December 2019).

The increase in the value of "Other inventories" over 2020 is mainly related to capacity guarantees in France, due to the increase in purchase prices observed since the June 2020 auctions (see note 5.1), and energy savings certificates inventories (see note 5.4.3).

13.3 Trade receivables

Accounting principles and methods

Trade receivables are initially recognised at the fair value of the consideration received or receivable, and subsequently carried at amortised cost or at fair value through OCI.

Trade receivables also include the value of unbilled receivables for energy already supplied, which are presented net of advances received from customers who pay in regular monthly instalments.

The Group applies IFRS 9's simplified approach to measure expected credit losses on trade receivables, using provision matrices established on the basis of credit loss histories.

Details of net trade receivables are as follows:

(in millions of euros)	***Note***	**31/12/2020**	**31/12/2019**
Trade receivables, gross value – excluding EDF Trading		14,686	15,066
contract assets	*13.3.3*	*389*	*400*
Trade receivables, gross value – EDF Trading		1,036	1,583
Impairment*		(1,201)	(1,043)
TRADE RECEIVABLES – NET VALUE		**14,521**	**15,606**

* *See note 1.4.1.3.*

Most trade receivables mature within one year.

Advances received from customers in France who pay in regular monthly instalments, amounting to €6,782 million at 31 December 2020 (€6,719 million at 31 December 2019), are deducted from trade receivables.

13.3.1 Trade receivables due and not yet due

	31/12/2020			31/12/2019		
(in millions of euros)	Gross value	Provision	Net value	Gross value	Provision	Net value
TRADE RECEIVABLES	**15,722**	**(1,201)**	**14,521**	**16,649**	**(1,043)**	**15,606**
overdue by up to 6 months	1,249	(242)	1,007	1,262	(187)	1,075
overdue by 6-12 months	465	(193)	272	367	(124)	243
overdue by more than 12 months	851	(526)	325	940	(514)	426
Trade receivables due	**2,565**	**(961)**	**1,604**	**2,569**	**(825)**	**1,744**
Trade receivables not yet due	**13,157**	**(240)**	**12,917**	**14,080**	**(218)**	**13,862**

13.3.2 Assignment of receivables

Accounting principles and methods

When it can be demonstrated that the Group has transferred substantially all the risks and benefits related to assignment of receivables, particularly the credit risk, the items concerned are derecognised.

Otherwise, the operation is considered as a financing operation, and the receivables remain in the balance sheet assets, with recognition of a corresponding financial liability.

(in millions of euros)	31/12/2020	31/12/2019
Trade receivables assigned and wholly retained in the balance sheet	84	-
Trade receivables assigned and partly retained in the balance sheet	60	32
Trade receivables assigned and wholly derecognised	792	1,042

The Group assigned trade receivables for a total of €792 millions at 31 December 2020, mainly concerning Edison, EDF SA and Dalkia (€1,042 million at 31 December 2019).

As most assignment operations are carried out on a recurrent, without-recourse basis, the corresponding receivables are no longer carried in the Group's consolidated balance sheet.

13.3.3 Contract assets

Contract assets are rights held by an entity to receive a consideration in return for goods or services supplied to customers, when such rights are conditional on something other than the passage of time. Most contract assets mature within one year.

The contract assets included in receivables represent an amount of €389 million at 31 December 2020 and €400 million at 31 December 2019 and mainly concern Framatome, Dalkia and EDF Renewables.

13.3.4 Other receivables

Details of other receivables are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Prepaid expenses	1,457	1,429
Compensation for Public Energy Service charges (CSPE)	1,993	1,667
VAT receivables	1,988	2,022
Other tax receivables	248	153
Other operating receivables	3,247	3,540
OTHER RECEIVABLES	**8,933**	**8,811**
Non-current portion	2,015	1,930
Current portion	6,918	6,881
Gross value	9,013	8,877
Impairment	(80)	(66)

Other operating receivables include €1,045 million of advances paid to suppliers (€1,278 million at 31 December 2019). Most of these advances concern the France – Generation and Supply segment.

EDF's Public Service Charges

The amount of expenses (excluding the annual contribution to repayment and associated interest) to be compensated to EDF for 2020 is €8,081 million.

The amounts received in 2020 (excluding the annual contribution to repayment and associated interest) totalled €7,732 million (including €5,333 million from the dedicated "energy transition" budget account and €2,399 million from the general budget).

Based on a receivable of €1,647 million at 31 December 2019, the operating receivable owed by the State to EDF amounts to €1,974 million at 31 December 2020. The situation will be closely monitored in view of the initial Finance Law for 2020 adopted by vote in late 2019, which provides for discontinuation of the special "energy transition" budget item from January 2021.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 17 July 2020 the CRE published its decision 2020-177 of 15 July 2020 setting out a forecast of EDF's public service charges for 2021 (€8,104 million), a revised forecast of charges for 2020 (€8,122 million), and the actual charges recorded for 2019 (€7,585 million).

The compensation mechanism for public energy service charges in France is presented in note 5.4.1.

13.4 Trade payables

(in millions of euros)	31/12/2020	31/12/2019
Trade payables – excluding EDF Trading	10,868	11,243
Trade payables – EDF Trading	1,032	1,624
TRADE PAYABLES	**11,900**	**12,867**

The Group has a reverse factoring programme allowing suppliers to transfer their receivables on EDF to a factoring company, at their own initiative.

For the Group, this programme does not cause any change in the substance and features of the receivables held by suppliers on EDF. In particular it does not affect the sequences of operating cash flows. The associated liabilities are therefore included in "trade payables" in the Group's financial statements.

13.5 Other liabilities

Details of other liabilities are as follows:

(in millions of euros)	31/12/2020	Including contract liabilities	31/12/2019	Including contract liabilities
Advances and progress payments received	1,788	1,344	1,975	1,761
Liabilities related to property, plant and equipment	4,196	-	3,824	-
Tax liabilities	4,532	-	4,439	-
Social charges	4,712	-	4,535	-
Deferred income on long-term contracts	3,290	3,233	3,412	3,412
Other deferred income*	827	430	641	509
Other	2,390	-	2,712	-
OTHER LIABILITIES	**21,735**	**5,007**	**21,538**	**5,682**
Non-current portion	4,874	3,092	4,928	3,473
Current portion	16,861	1,915	16,610	2,209

* *Including the initial payment made under the Fessenheim compensation protocol (see note 5.4.3).*

13.5.1 Advances and progress payments received

Advances and progress payments received comprise €518 million of payments made by the customers in Framatome's long-term contracts (€651 million at 31 December 2019).

13.5.2 Tax liabilities

At 31 December 2020, tax liabilities mainly include an amount of €502 million for the CSPE to be collected by EDF on energy supplied but not yet billed, less the CSPE tax collected on advances from customers who pay in regular monthly instalments (€560 million at 31 December 2019).

13.5.3 Deferred income on long-term contracts

EDF's deferred income on long-term contracts at 31 December 2020 comprises €1,713 million (€1,709 million at 31 December 2019) of partner advances made to EDF under the nuclear plant financing plans.

Deferred income on long-term contracts also includes an advance of €1.7 billion paid to the EDF group in 2010 under the agreement with the Exeltium consortium. This advance is transferred to the income statement progressively over the term of the contract (24 years).

13.5.4 Other

Accounting principles and methods

Investment subsidies

Investment subsidies received by Group companies are included in liabilities under the heading "Other liabilities" and transferred to income as and when the economic benefits of the corresponding assets are utilised.

The final line of the table of other liabilities includes investment subsidies received during 2020, amounting to €414 million (€543 million in 2019).

13.5.5 Contract liabilities

Contract liabilities represent an entity's obligations to provide customers with goods or services for which it has already been paid, or for which payment is due.

Changes in contract liabilities were as follows:

(in millions of euros)	31/12/2019	Amounts recorded during the period	Amounts transferred to sales during the period	Amounts cancelled during the period with no impact on sales	Effect of unwinding the discount	Change in scope of consolidation	Foreign exchange effect	31/12/2020
Advance payments received	1,761	1,066	(1,429)	(25)	(1)	4	(32)	1,344
Deferred income on long-term contracts	3,412	465	(705)	-	60	14	(13)	3,233
Other deferred income	509	320	(390)	-	-	1	(10)	430

These liabilities comprise the majority of advances and progress payments received, amounting to €1,344 million (principally concerning the Framatome, United Kingdom and France – Regulated Activities segments), and the majority of deferred income (on long-term and other contracts), amounting to €3,663 million (principally concerning the France – Generation and Supply segment). They thus total €5,007 million at 31 December 2020 (€5,682 million at 31 December 2019).

Contracts expiring in more than one year on which obligations are unfulfilled or partially fulfilled at the reporting date should generate sales revenues of approximately €10,910 million which have not yet been recognised. €1,183 million of these sales revenues will be recognised progressively until 2034 on the Exeltium contract, and the balance will be recognised over the operating period for contracts relating to jointly-operated power plants, and over the term of the contract for other firm sale contracts (excluding energy sales).

Note 14 Equity and basic earnings per share and diluted earnings per share

14.1 Share capital

Accounting principles and methods

Share issue expenses correspond exclusively to external costs expressly related to the capital increase. They are charged against the issue premium at their net-of-tax value.

Other expenses are classified as expenses of the period.

At 31 December 2020, EDF's share capital amounts to €1,549,961,789.50 comprising 3,099,923,579 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.68% by the French State, 14.94% by the public (institutional and private investors) and 1.36% by current and retired Group employees, with 0.02% held by EDF as treasury shares.

In 2020, the change in capital is related to the cancellation of treasury shares.

In 2019, the changes in capital included €881 million related to payment of the balance of the scrip dividend for 2018 and the interim dividend for 2019.

Under Article L. 111-67 of the French Energy Code, the French State must hold more than 70% of the capital of EDF at all times.

14.2 Treasury shares

Accounting principles and methods

Treasury shares are shares issued by EDF and held either by that company or by other entities in the consolidated Group. They are valued at acquisition cost and deducted from equity until the date of disposal. Net gains or losses on disposals of treasury shares are directly included in equity and do not affect net income.

A share repurchase programme authorised by the General Shareholders' Meeting of 9 June 2006 was implemented by the Board of Directors, within the limit of 10% of the total number of shares making up the Company's capital. The initial duration of the programme was 18 months, renewed for 12 months then by tacit agreement every year.

A liquidity contract exists for this programme, as required by the French market regulator AMF (Autorité des marchés financiers).

At 31 December 2020, treasury shares deducted from consolidated equity represent 830,000 shares with total value of €10 million.

14.3 Dividends

The interim dividend for 2019 decided by EDF's Board of Directors on 19 November 2019 was €0.15 per share. It was paid out in the form of new shares (scrip option) or cash on 17 December 2019 and amounted to a total of €458 million. The French government opted for the scrip interim dividend for 2019. The cash dividend paid to shareholders who did not take the scrip option amounted to €27 million.

In the context of the Covid-19 pandemic, in response to the imperative needs for solidarity and responsibility to all the Company's stakeholders, it was decided at the General Shareholders' Meeting of 7 May 2020 that the interim dividend would be the only dividend for 2019.

In addition, EDF did not distribute an interim dividend in respect of the 2020 financial year.

14.4 Perpetual subordinated bonds

Accounting principles and methods

Perpetual subordinated bonds ("hybrid" bond issue)

The perpetual subordinated bonds issued by the Group incorporate options for redemption at the initiative of EDF. These options may be exercised after a minimum period that depends on the specific terms of each issue, and subsequently at each coupon date or in the event of highly specific circumstances. The annual yield is fixed and reviewable based on contractual clauses that vary according to the specific terms of the issuance. There is no obligation for EDF to make any payment, due to the existence of contractual clauses entitling it to defer payment indefinitely.

However, those clauses stipulate that any deferred payments must be made in the event of a dividend distribution. All these features give EDF an unconditional right to avoid paying out cash or another financial asset for the principal or interest. Consequently, in compliance with IAS 32, these bonds are recorded as equity instruments and any payment made is treated in the same way as dividends.

14.4.1 Outstanding perpetual subordinated bonds at 31 December 2020

At 31 December 2020, perpetual subordinated bonds carried in equity amounted to €11,290 million (less net-of-tax transaction costs) (€9,209 million at 31 December 2019).

Issues of perpetual subordinated bonds were recorded in equity at 31 December 2020 at the total net value of €2,081 million (see note 14.4.2).

Interest paid by EDF to the bearers of perpetual subordinated bonds issued totalled €501 million in 2020 and €589 million in 2019. The resulting cash payout is reflected in a corresponding reduction in Group equity.

In January 2021, EDF paid interest of around €276 million to the bearers of perpetual subordinated bonds.

Perpetual subordinated bonds in the accounts of EDF

(in millions of currency units)

Entity	Issue	Nominal amount	Currency	Redemption option	Coupon
EDF	01/2013	1,250	EUR	12 years	5.38%
EDF	01/2013	1,250	GBP	13 years	6.00%
EDF	01/2013	2,098	USD	10 years	5.25%
EDF	01/2014	1,500	USD	10 years	5.63%
EDF	01/2014	267	EUR	8 years	4.13%
EDF	01/2014	1,000	EUR	12 years	5.00%
EDF	01/2014	750	GBP	15 years	5.88%
EDF	10/2018	1,250	EUR	6 years	4.00%
EDF	11/2019	500	EUR	8 years	3.00%
EDF	09/2020	850	EUR	6.5 years	2.88%
EDF	09/2020	1,250	EUR	10 years	3.38%

14.4.2 Changes in perpetual subordinated bonds during 2020

Hybrid note issues

On 8 September 2020, EDF launched two new issues of Euro-denominated hybrid notes for a total nominal amount of €2.1 billion, consisting of:

- a €850 million perpetual non-call hybrid notes issue with an initial coupon of 2.875% and a first redemption at the option of the Company on 15 December 2026; and
- a €1.250 billion perpetual non-call hybrid notes issue with an initial coupon of 3.375% and a first redemption at the option of the Company on 15 June 2030.

The Company can redeem the hybrid notes for cash at any time during the 90 days before the first interest reset date, which is expected to be in 6.5 years (with a first reset date of March 2027) for the 6.5-year non-call hybrid notes, and in 10 years (with a first reset date of September 2030) for the 10-year non-call hybrid notes, and on every coupon payment date thereafter.

The settlement date was 15 September 2020 and the hybrid notes were admitted to trading on the regulated market of Euronext Paris at that date.

These issues show the Company's strong commitment to financing through hybrid capital securities, which are a permanent part of its capital structure. The proceeds of the hybrid notes issue are used for general corporate purposes of the Company.

The hybrid notes have been admitted to trading on Euronext Paris. The rating agencies have assigned the hybrid notes a rating of Baa3/BB-/BBB (Moody's/S&P/Fitch), and an equity content of 50%.

This issue was recorded in equity upon reception of the proceeds, total net value of €2,081 million.

14.5 Convertible Green Bonds (OCEANEs)

Accounting principles and methods

OCEANEs (bonds convertible into new shares and/or exchangeable for existing shares)

OCEANE bonds, which are convertible by remittal of a fixed number of shares in exchange for a fixed amount of cash (the "fixed-for-fixed" rule) give rise to recognition of a debt component and an equity component, in accordance with IAS 32.

The debt-equity proportions remain constant even if there is a change in the likelihood that the conversion option will be exercised.

The debt component is measured by the discounted future cash flows method using a discount rate applicable to a comparable market bond with no conversion option. The equity component corresponds to the difference between the fair value of the bond and the fair value of the debt component.

Issue expenses are allocated between the debt and equity components in the same proportions as the initial allocation.

On 8 September 2020, EDF made an issuance of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*) with the nominal amount of €2,400 million and an issue value of €2,569 million. These bonds are recorded at an amount of €2,389 million net of expenses and taxes in "Financial loans and borrowings" and €126 million in "Equity". The key features of this issue are presented in note 18.3.2.2.

14.6 Non-controlling interests (minority interests)

14.6.1 Details of non-controlling interests

	31/12/2020			31/12/2019	
(in millions of euros)	Ownership %	Equity (non-controlling interests)	Net income attributable to non-controlling interests	Equity (non-controlling interests)	Net income attributable to non-controlling interests
Principal non-controlling interests:					
EDF Energy Nuclear Generation Ltd.	20.0%	2,526	(91)	2,764	(16)
NNB Holding Ltd.	33.5%	4,716	1	3,977	5
EDF Investissements Groupe SA	7.54%	515	11	516	10
Luminus SA	31.4%	400	(5)	376	(6)
Framatome	24.5%	115	(26)	163	(22)
Other non-controlling interests		**1,321**	**75**	**1,528**	**56**
TOTAL		**9,593**	**(35)**	**9,324**	**27**

Non-controlling interests in EDF Energy Nuclear Generation Ltd. (formerly British Energy), which is owned 80% by the Group *via* EDF Energy, correspond to Centrica's share.

Non-controlling interests in NNB Holding Limited, the holding company for the Hinkley Point C project, which is owned 66.5% by the Group *via* EDF Energy, correspond to CGN's share.

Non-controlling interests in EDF Investissements Groupe correspond to the investment held by Natixis Belgique Investissements.

Non-controlling interests in Luminus correspond to the investments held by Belgian local authorities.

Non-controlling interests in Framatome, owned 75.5% by the Group *via* EDF SA, correspond to the 19.5% share held by Mitsubishi Heavy Industries and the 5% share held by Assystem.

Other non-controlling interests principally consist of the minority interests in Sizewell C Holding Co., owned 80% by the Group *via* EDF Energy, and subsidiaries of the Edison and EDF Renewables subgroups.

Other non-controlling interests also include instruments in the form of bonds convertible into shares, issued by the Dalkia group and subscribed by minority interests, amounting to a total €202 million at 31 December 2020 (€239 million in 2019).

14.6.2 Non-controlling interests in EDF Energy

The key financial indicators (100% basis) for EDF Energy Nuclear Generation Ltd. are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Non-current assets	23,317	25,807
Current assets	4,399	3,649
TOTAL ASSETS	**27,716**	**29,456**
Equity	12,630	13,820
Non-current liabilities	14,741	15,175
Current liabilities	345	461
TOTAL EQUITY AND LIABILITIES	**27,716**	**29,456**
Sales	3,091	2,807
Net income	(455)	(81)
GAINS AND LOSSES RECORDED DIRECTLY IN EQUITY	**(735)**	**841**
Net cash flow from operating activities	982	328
Net cash flow from investing activities	(380)	(474)
Net cash flow from financing activities	(335)	-
CASH AND CASH EQUIVALENTS – OPENING BALANCE	**329**	**472**
Net increase/(decrease) in cash and cash equivalents	267	(146)
Effect of currency fluctuations	(11)	17
Other	-	(14)
CASH AND CASH EQUIVALENTS – CLOSING BALANCE	**585**	**329**
Dividends paid to non-controlling interests	68	-

14.7 Basic earnings per share and diluted earnings per share

The diluted earnings per share is calculated by dividing the Group's share of net income, corrected for dilutive instruments and the payments made during the year to bearers of perpetual subordinated bonds, by the weighted average number of potential shares outstanding over the period after elimination of treasury shares.

The following table shows the reconciliation of the basic and diluted earnings used to calculate earnings per share (basic and diluted), and the variation in the weighted average number of shares used in calculating basic and diluted earnings per share:

(in millions of euros)	2020	2019*
Net income attributable to ordinary shares	650	5,155
• *EDF net income from continuing operations*	*804*	*5,639*
• *EDF net income from discontinued operations*	*(154)*	*(484)*
Payments on perpetual subordinated bonds	(501)	(589)
Net income used to calculate earnings per share	**149**	**4,566**
• *from continuing operations*	*303*	*5,050*
• *from discontinued operations*	*(154)*	*(484)*
Cancellation of the effect of dilutive instruments	1	-
Net income used to calculate diluted earnings per share	**150**	**4,566**
• *from continuing operations*	*304*	*5,050*
• *from discontinued operations*	*(154)*	*(484)*
Average weighted number of ordinary shares outstanding during the year	**3,106,323,609**	**3,029,504,511**
Effect of dilutive instruments	9,149,131	-
Average weighted number of diluted shares outstanding during the year	**3,115,472,740**	**3,029,504,511**
Earnings per share *(in euros)* **:**		
BASIC EARNING PER SHARE	**0.05**	**1.50**
DILUTED EARNINGS PER SHARE	**0.05**	**1.50**
BASIC EARNINGS PER SHARE OF CONTINUING OPERATIONS	**0.10**	**1.67**
DILUTED EARNINGS PER SHARE OF CONTINUING OPERATIONS	**0.10**	**1.67**
BASIC EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	**(0.05)**	**(0.17)**
DILUTED EARNINGS PER SHARE OF DISCONTINUED OPERATIONS	**(0.05)**	**(0.17)**

* *Restated for the impacts of IFRS 5 due to the change in scope of E&P operations (see note 1.4.2).*

On 8 September 2020, EDF issued unsecured senior Green Bonds convertible into new shares and/or exchangeable for existing shares of the Company (*OCEANEs Vertes,* see note 18.3.2.2). The diluted earnings per share incorporates the impact of conversion of these bonds, which is possible from 15 December 2020. The impact on the net income used to calculate diluted earnings per share for 2020 is not significant.

Note 15 Provisions related to nuclear generation and dedicated assets

Accounting principles and methods

The Group recognises provisions when it has a present obligation (legal or constructive) arising from a past event, an outflow of resources will probably be required to settle the obligation, and the obligation amount can be estimated reliably.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if the Group is virtually certain of receiving it.

Provisions are determined based on the Group's expectation of the cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Group, and if necessary, experience of similar transactions or operations, based on independent expert reports, or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

In the case of decommissioning provisions for power plants in operation, adjustments are recorded *via* fixed assets.

The discount effect generated at each closing to reflect the passage of time is recorded under "Discount effect" in financial expenses.

Changes in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in contractor quote are recorded:

- as an increase or decrease in the corresponding assets, up to the net book value, if the provision was initially covered by balance sheet assets;
- in the income statement in all other cases.

Provisions related to nuclear generation mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management, for waste removal and conditioning and long-term radioactive waste management are established in accordance with the obligations and final contributions specific to each country;
- costs for decommissioning power plants;
- costs relating to fuel in the reactor when the reactor is shut down (provisions for last cores). These correspond to the cost of the fuel stock in the reactor that is not totally spent at the time of the final reactor shutdown and cannot be reused due to technical and regulatory constraints, the cost of processing for that fuel, and the cost of removal and storage of the resulting waste.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved.

The breakdown between current and non-current provisions related to nuclear generation is as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Current	Non-current	Total	Current	Non-current	Total
Provisions for the back-end of the nuclear cycle	1,430	26,137	27,567	1,432	23,822	25,254
Provisions for decommissioning and last cores	723	32,196	32,919	364	31,761	32,125
Provisions related to nuclear generation	**2,153**	**58,333**	**60,486**	**1,796**	**55,583**	**57,379**

The breakdown of provisions by company is shown below:

(in millions of euros)	EDF *Note 15.1*	EDF Energy *Note 15.2*	Belgium *Note 15.3*	Total
Provisions for spent fuel management	11,322	1,286	-	12,608
Provisions for waste removal and conditioning	-	546	-	546
Provisions for long-term radioactive waste management	13,300	1,106	7	14,413
PROVISIONS FOR THE BACK-END OF THE NUCLEAR CYCLE AT 31/12/2020	**24,622**	**2,938**	**7**	**27,567**
Provisions for the back-end of the nuclear cycle at 31/12/2019	**22,159**	**3,088**	**7**	**25,254**
Provisions for nuclear plant decommissioning	17,489	10,170	377	28,036
Provisions for last cores	2,711	2,172	-	4,883
PROVISIONS FOR DECOMMISSIONING AND LAST CORES AT 31/12/2020	**20,200**	**12,342**	**377**	**32,919**
Provisions for decommissioning and last cores at 31/12/2019	**19,561**	**12,195**	**369**	**32,125**
PROVISIONS RELATED TO NUCLEAR GENERATION AT 31/12/2020	**44,822**	**15,280**	**384**	**60,486**
Provisions related to nuclear generation at 31/12/2019	**41,720**	**15,283**	**376**	**57,379**

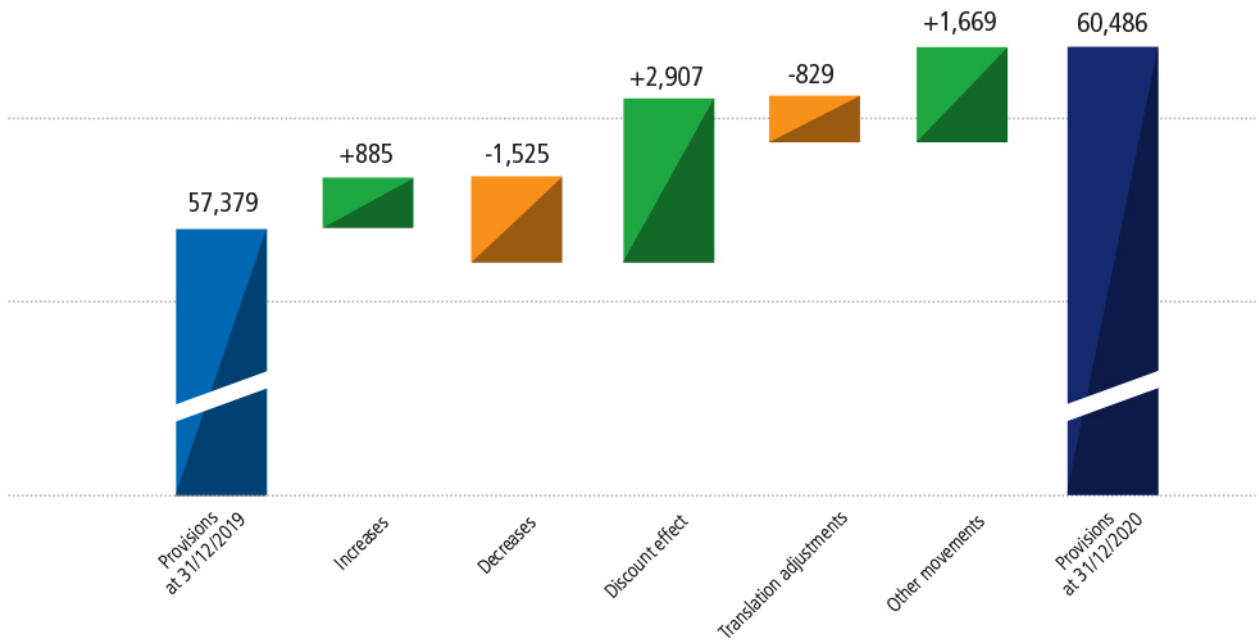
The movement in provisions for the back-end of the nuclear cycle, provisions for decommissioning and provisions for last cores breaks down as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2020
Provisions for spent fuel management	12,326	639	(950)	660	(79)	12	12,608
Provisions for waste removal and conditioning	1,337	9	(25)	56	(29)	(802)	546
Provisions for long-term radioactive waste management	11,591	104	(221)	1,069	(58)	1,928	14,413
Provisions for the back-end of the nuclear cycle	**25,254**	**752**	**(1,196)**	**1,785**	**(166)**	**1,138**	**27,567**
Provisions for nuclear plant decommissioning	27,609	133	(230)	957	(557)	124	28,036
Provisions for last cores	4,516	-	(99)	165	(106)	407	4,883
Provisions for decommissioning and last cores	**32,125**	**133**	**(329)**	**1,122**	**(663)**	**531**	**32,919**
PROVISIONS RELATED TO NUCLEAR GENERATION	**57,379**	**885**	**(1,525)**	**2,907**	**(829)**	**1,669**	**60,486**
Current portion	1,796						2,153
Non-current portion	55,583						58,333

The change in provisions related to nuclear generation in 2020 is mainly due to a 20bp decrease in the real discount rate in France and the United Kingdom. The corresponding effects are included in the "Discount effect" (€1,042 million) for provisions adjusted through the income statement, and in "Other movements" (€1,351 million) for changes in provisions backed by assets (assets associated with provisions and underlying assets in France and the United Kingdom; the receivable representing amounts due from the Nuclear Liabilities Fund (NLF) and the British government in the United Kingdom).

Details of the change in provisions related to nuclear generation in 2020 are as follows:

Provisions related to nuclear generation
In million of euros



15.1 Provisions related to nuclear generation and dedicated assets in France

15.1.1 Nuclear provisions

In France, the provisions established by EDF SA for the nuclear generation fleet result principally from the Law of 28 June 2006 on long-term management of radioactive materials and waste, and the associated implementing provisions concerning secure financing of nuclear expenses.

In compliance with the accounting principles described above:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF also holds dedicated assets for secure financing of long-term obligations (see note 15.1.2).

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs carries uncertainty factors such as described in note 1.3.4.2.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores in France are as follows:

(in millions of euros)	Notes	31/12/2019	Increases	Decreases	Discount effect	Other movements	31/12/2020
Provisions for spent fuel management	15.1.1.1	10,823	625	(744)	626	(8)	11,322
● *amount unrelated to the operating cycle*		*1,152*	*65*	*(14)*	*109*	*(15)*	*1,297*
● *amount outside the scope of the Law of 28 June 2006*		*1,019*	*41*	*(35)*	*51*	-	*1,076*
Provisions for waste removal and conditioning	15.1.1.2	805	6	(25)	46	(832)	-
Provisions for long-term radioactive waste management	15.1.1.2	10,531	101	(221)	1,016	1,873	13,300
Provisions for the back-end of the nuclear cycle		**22,159**	**732**	**(990)**	**1,688**	**1,033**	**24,622**
Provisions for nuclear plant decommissioning	15.1.1.3	16,937	133	(181)	780	(180)	17,489
Provisions for last cores	15.1.1.4	2,624	-	(99)	94	92	2,711
Provisions for decommissioning and last cores		**19,561**	**133**	**(280)**	**874**	**(88)**	**20,200**
PROVISIONS RELATED TO NUCLEAR GENERATION		**41,720**	**865**	**(1,270)**	**2,562**	**945**	**44,822**
Provisions related to nuclear generation within the scope of the Law of 28 June 2006*		***40,701***	***824***	***(1,235)***	***2,511***	***945***	***43,746***
Provisions related to nuclear generation outside the scope of the Law of 28 June 2006*		***1,019***	***41***	***(35)***	***51***	***-***	***1,076***

* *Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application decrease concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations (see below).*

The discount effect comprises the €1,520 million cost of unwinding the discount, and the €1,042 million effects of the change in the real discount rate in 2020 which were recorded in the income statement for provisions with no related assets (costs of unwinding the discount).

Other movements mainly include:

- the €707 million effect of the change in the real discount rate at 31 December 2020 for provisions with related assets;
- reclassification of €841 million previously included in provisions for waste removal and conditioning and €813 million previously included in provisions for nuclear plant decommissioning (corresponding to the cost of interim storage and processing of steam generators in a centralised facility), as provisions for long-term radioactive waste management, to ensure consistency with the most recent official breakdown of nuclear expenses in defined operations attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses.

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Recyclage) and the French Atomic Energy Commission (Commissariat à l'énergie atomique or CEA) signed an agreement in December 2004 which transferred the management and financing of final shutdown, decommissioning and waste recovery and reconditioning for the UP1 reprocessing facility at Marcoule to the CEA. In return, EDF paid the CEA a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs;
- EDF, AREVA and AREVA NC (now Orano Recyclage) signed two agreements in December 2008 and July 2010 defining the legal and financial terms for the transfer to AREVA NC of EDF's contractual obligations regarding its financial contribution to the dismantling of La Hague installations and the recovery and conditioning of waste. In application of those agreements, EDF paid Orano Recycle a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs.

15.1.1.1 Provisions for spent fuel management

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French State, is to process spent fuel and to recycle the separated plutonium in the form of MOX fuel (Mixed OXide of plutonium and uranium).

The quantities processed by Orano at the request of EDF, totalling approximately 1,100 tonnes per year, are determined based on the quantity of recyclable plutonium in the reactors that are authorised to load MOX fuel.

Consequently, provisions for spent fuel management cover the following services to be provided by Orano Recyclage:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter.

The processing expenses included in these provisions exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are measured based on forecast physical flows at the year-end, with reference to the contracts with Orano which define the terms for implementation of the framework agreement for the period 2008-2040. The most recent contract, signed on 5 February 2016, covers the period 2016-2023. These contracts contain price indexes that are revised annually.

In 2018, the Board of Directors approved resumption of recycling of uranium from reprocessing (which had been suspended in 2013 pending availability of a new industrial schema), with loading of the first fuel assemblies scheduled for 2023, subject to technical adaptations and the necessary authorisations from the Nuclear Safety Authority. The objective is to start recycling in certain 900MW units, and later in certain 1300MW units. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018. In 2020, EDF continued to monitor the plants' preparation trajectory with reference to those contracts and conducted tests of the interfaces between suppliers. The portion of the provision for spent fuel management relating to storage of uranium from reprocessing (€882 million) will be recovered once all the industrial, regulatory and economic conditions for resumption of uranium recycling have been fulfilled, but EDF has no control over fulfilment of some of these conditions.

This provision also covers long-term storage of spent fuel that cannot currently be recycled in existing industrial facilities or under construction: plutonium fuel (MOX) or uranium fuel derived from processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available. Dedicated assets are held in association with this provision, which is unrelated to the operating cycle as defined by the law (see note 15.1.2). The provision is founded on a scenario involving construction, managed by EDF (that will be the nuclear operator), of a centralised underwater storage site at La Hague. This project was presented during the public debate on the National Plan for Managing Radioactive Matter and Waste in 2019-2020, and will be subjected to a specific public consultation in 2021, organised by France's National Public Debate Commission (CNDP).

15.1.1.2 Provisions for long-term radioactive waste management

Following the reclassifications applied at 31 December 2020 as explained in 15.1.1, provisions for long-term radioactive waste management concern the following future expenses:

- interim storage, removal and storage of radioactive waste packages resulting from spent fuel processing;
- direct storage, where relevant, of spent fuel that cannot be recycled in existing installations: specifically plutonium fuel (MOX) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis;
- characterisation, processing, conditioning and interim storage of radioactive waste resulting from decommissioning and certain operating waste – these operations were previously covered by the provisions for nuclear plant decommissioning and provisions for waste removal and conditioning;
- final storage of this radioactive waste;
- EDF's share of the costs of studies, construction, operation and maintenance, shutdown and surveillance of existing and future storage centres.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting in particular from plant decommissioning or spent fuel processing at La Hague (comprising all fuel in reactors at 31 December, irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by ANDRA.

The provisions for long-term radioactive waste management break down as follows:

(in millions of euros)	Storage centre	31/12/2020	31/12/2019
Very low-level and low and medium-level waste	Very low-level waste: Morvilliers (ANDRA) Low and medium-level waste: Soulaines (ANDRA)	2,856	1,561
Long-lived low-level waste	Project under examination: Soulaines (ANDRA)	365	330
Long-lived medium and high-level waste	Geological storage centre (Cigéo project)	10,079	8,640
PROVISIONS FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT		**13,300**	**10,531**

Very low-level and low and medium-level waste

Very low-level waste and low and medium-level waste come from nuclear facilities in operation or in the process of being decommissioned:

- very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of metals (large components, piping, support structures, etc.) or rubble (concrete, earth, etc.). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA;
- low and medium-level waste (gloves, filters, resins, materials, etc.) is stored at surface level at the Soulaines storage centre managed by ANDRA.

The cost of removing, processing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of current contracts with transporters, ANDRA for operation of the existing storage centres and the costs of the Cyclife France plant for waste processing.

In 2019, the inventory assumptions were updated by a time series analysis of past waste removal and better characterisation of future volumes, leading to a €206 million increase in the provision (with an unfavourable effect of €132 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

In 2020, the assumptions concerning the shares of costs were reassessed, to reflect the long-term distribution between the three producers concerned of fixed storage costs for very low-level waste and low and medium-level waste. All the effects of this cost-share updating work have led to a €179 million increase in the provision (with an unfavourable effect of €50 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

Also, since 31 December 2020, following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the treatment, conditioning and interim storage of waste; many of these operations were previously included in the provisions for nuclear plant decommissioning and waste removal and conditioning (reclassification of €979 million applied at 31 December 2020).

Finally, for very low-level waste, in February 2020, following public debate of 2019-2020 concerning the French National Plan for the Management of Radioactive Materials and Waste (PNGMDR), the conclusions of the Ministry for the Ecological and Inclusive Transition and the ASN pave the way for a change in regulations that would allow recycling of very low-level metal waste after processing: "The Government will make changes to the regulatory framework applicable to the management of very low-level waste, in order to introduce a new possibility of targeted exceptions, allowing recycling, after fusion and decontamination and on a case by case basis, of very low-level radioactive metallic waste." A change to the regulations had been proposed by the General Risk Prevention Department (DGPR) and submitted to public consultation.

Long-lived low-level waste

Long-lived low-level waste belonging to EDF essentially consists of graphite waste from the ongoing decommissioning of the former UNGG (natural uranium graphite gas-cooled) reactors.

As this waste has a long lifetime but is lower-level than long-lived medium and high-level waste, specific subsurface storage requirements apply under the French Law of 28 June 2006.

Following the initial geological investigations, in July 2015 ANDRA remitted a report on the proposed storage centre for long-lived low-level waste on a site located in the Soulaines region (Aube) in France. This report was submitted to the ASN for its opinion. Uncertainties remain about the site's capacity to accommodate all of the waste included in the baseline inventory of the long-lived low-level waste storage facility.

Further studies were planned under the 2016-2018 period of the National Plan for the Management of Radioactive Materials and Waste (PNGMDR), concerning both the feasibility of this storage centre and the search for additional waste management solutions. The ASN's opinion on management of this waste, issued on 6 August 2020 after the work done over the period 2016-2018, and the orientations proposed by the head of the PNGMDR in the current elaboration phase of the fifth edition of the PNGMDR, set a horizon of 2023 for definition by ANDRA of several reference management scenarios, and of the needs for complementary concepts and the production of a file (equivalent to a Summary Preliminary Plan or avant-projet sommaire – APS) presenting the technical and safety options selected for storage of long-lived low-level waste.

Long-lived medium and high-level waste

Long-lived medium and high-level waste essentially comes from processing of spent fuel, and to a lesser extent waste resulting from nuclear plant decommissioning (metallic components that have been inside the reactor).

The French Law of 28 June 2006 requires reversible storage in deep geological layers for this type of waste.

The provision established for long-lived medium and high-level waste is the largest component of provisions for long-term radioactive waste management.

Until June 2015 the gross value and disbursement schedules for forecast expenses were based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by a working group formed under supervision of the State involving representatives of the administrations concerned, ANDRA and the producers of waste (EDF, Orano, CEA). EDF applied a reasonable approach to information supplied by this working group, leading to a benchmark cost, for storage of waste from all producers, of €14.1 billion under the economic conditions of 2003 (€20.8 billion under 2011 economic conditions, based on the 2011 inventory).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project.

On this basis, ANDRA drew up figures which, in compliance with the Law of 28 June 2006, were subjected to a consultation process with waste producers started in late 2014 by the French Department for Energy and Climate (Direction générale de l'énergie et du climat or DGEC). In April 2015 EDF and the other producers sent the DGEC their comments on ANDRA's report and a joint estimation of the target Cigéo storage cost due to divergences in the valuation of technical optimisations and their induced effects. All this information was included, together with the ASN's opinion, in a report submitted to the Minister for Ecology, Sustainable Development and Energy.

On 15 January 2016 the Ministry of Ecology, Sustainable Development and Energy issued a Ministerial Order setting the target cost for the Cigéo storage project at €25 billion under 2011 year-end economic conditions. The cost as defined constitutes an objective to be met by ANDRA, in compliance with safety standards set by the ASN, working in close liaison with the operators of nuclear installations.

In application of this Ministerial Order, the cost of the Cigéo project will be regularly updated, at least at each key milestone in the course of the project's development (authorisation to create the facility, commissioning, end of the "pilot industrial phase", safety reviews) in accordance with the opinion of the ASN.

In April 2016 ANDRA sent the ASN a safety option report (DOS). The law of 11 July 2016 clarified the concept of reversibility.

On 11 January 2018, the ASN issued its opinion on the DOS. It considered that the Cigéo project had reached satisfactory overall technological maturity at that stage. This opinion included a requirement for examination of alternatives to the proposals for storage of bituminous waste at Cigéo. A group of experts appointed by the DGEC in September 2018 to draw up a report on current bituminous waste management concluded in September 2019 that various options were feasible (storage or neutralisation) but stressed the importance of continuing the studies in order to identify the most appropriate option.

Detailed design studies for Cigéo are currently being finalised by ANDRA. The Detailed Design Review by a group of independent experts, organised at the request of the DGEC, reported its conclusions in October 2020. While issuing a generally favourable opinion for the ANDRA's submission, the Group made a certain number of recommendations for finalisation of the detailed design studies and the application for authorisation to create the centre, calling for closer involvement of EDF, Orano and the CEA on these matters.

Under the schedule prepared by ANDRA, the application to develop Cigéo (classified as a basic nuclear facility) is now due to be made in 2021, with a corresponding extension for obtaining authorisation. Producers are still currently working on the hypothesis that the first waste packages would be received in 2031.

On 3 August 2020, ANDRA filed an application with the Ministry for the Ecological Transition for *Déclaration d'utilité publique* (DUP) officially recognising the public utility of the Cigéo storage centre. After examination by the government departments, this application will give rise to a public debate expected to take place in the second quarter of 2021. Publication of the DUP decree, which would automatically confer compatibility on the planning documents, is expected in late 2021.

Finally, the French finance law for 2021, published in the *Journal officiel* of 30 December 2020, includes a change to the tax treatment of this project (based on storage tax instead of the standard tax regime). The associated measures remain to be defined and managed by the Government to prevent any cost increase for the Cigeo project.

Also, since 31 December 2020, following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the conditioning and interim storage of low and medium-level waste at the ICEDA storage facility (*installation de conditionnement et d'entreposage des déchets activés*). This facility, constructed at the Bugey power plant, received its first waste packages in September 2020 after the ASN authorised its commissioning on 28 July 2020. These nuclear expenses were previously covered by the provisions for waste removal and conditioning (the reclassification at 31 December 2020 concerned an amount of €675 million).

15.1.1.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the basic nuclear facilities (*installations nucléaires de base*, INB) it operates. The final shutdown and decommissioning process is governed by legal provisions and regulations set out in Articles L. 593-25 to L. 593-20 and R. 593-65 to R. 593-74 in the Environmental Code. It involves the following operations for each INB:

- a definitive shutdown declaration, to be made at least two years prior to the planned shutdown date;
  - since the Energy Transition Law of 17 August 2015, the final shutdown of the INB, which takes place during its operating phase, is considered separately from dismantling, as a notable change of lesser importance (simply requiring a declaration by the operator to the Minister and the ASN);
- a dismantling plan compiled by the operator and sent to the Minister in charge of nuclear safety, which after examination by the authorities and a public inquiry, leads to a decree prescribing dismantling that authorises the start of dismantling operations;
- key-stage progress reviews submitted for the ASN's approval, with a safety file specific to the dismantling operations to be performed;
- an internal control process concerning significant changes introduced by the operator in the case of operations that must be declared to or approved by the ASN;
- finally, once these operations are complete, declassification of the facility, which removes it from the legal regime governing basic nuclear facilities.

The decommissioning scenario adopted by EDF complies with France's Environmental Code, which requires as short a period as possible to elapse between final shutdown and dismantling in economically acceptable conditions and in compliance with the principles laid down in Article L. 1333-1 of the Public Health Code (radioprotection) and section II of Article L. 110-1 of the Environmental Code (protection of the environment). The intended end-state is industrial use: the sites will be restored to their original condition and will be reusable for industrial facilities.

The ongoing operations concern plants that were constructed and operated before the nuclear fleet currently in operations, known as "first-generation" plants, and the Superphenix plant and Irradiated Materials Workshop. These operations cover four different technologies: a heavy water reactor (Brennilis), a sodium-cooled fast-neutron reactor (the Superphenix at Creys-Malville), natural uranium graphite gas-cooled (UNGG) reactors (at Chinon, Saint Laurent and Bugey) and a pressurised water reactor (PWR at Chooz). Each of them is a first for EDF, and apart from the PWR at Chooz, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. Decommissioning of the Chooz PWR is benefiting from past experience (essentially in the US and limited), but the plant has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific challenges.

The experience gained from dismantling the Chooz PWR will nonetheless improve the robustness of the studies and estimates of future decommissioning costs for the nuclear fleet currently in operation ("second-generation" plants). But so far, neither EDF nor any other operator has begun a decommissioning programme on a scale comparable to the current PWR fleet, and as a result the estimates include both opportunities and risks, especially associated with the scale effect.

At Fessenheim, the two pressurised water reactors were shut down definitively on 22 February 2020 and 30 June 2020 respectively, in accordance with the law and before the end of their technical operating life. The Consolidated Preliminary Plan (*avant-projet consolidé* or APC) was finalised in late 2018, with more in-depth studies and derisking of the Summary Preliminary Plan (*avant-projet sommaire* or APS). The dismantling plan was sent to the ASN in September 2019 together with the declaration of the permanent shutdown of this INB. The studies conducted in 2019 and 2020 focused on preparing the dismantling plan, which was sent to the ASN on 2 December 2020. After the filing date, the ASN will examine the documents for a period of 3 to 5 years.

The decommissioning provisions cover future decommissioning expenses as described above (excluding the cost of removing and storing waste, which is covered by the provisions for long-term waste management).

Details of changes in decommissioning provisions for nuclear power plants are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Discount effect	Other movements	31/12/2020
Provisions for decommissioning nuclear plants in operation	13,244	-	(43)	474	(900)	12,775
Provisions for decommissioning permanently shut-down nuclear plants	3,693	133	(138)	306	720	4,714
DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	**16,937**	**133**	**(181)**	**780**	**(180)**	**17,489**

Other movements notably include reclassification of the decommissioning provision concerning the two Fessenheim reactors from "Provisions for decommissioning nuclear plants in operation" to "Provisions for decommissioning permanently shut-down nuclear plants" following their final shutdown in the first half of 2020.

For nuclear power plants currently in operation (PWR pressurized water reactor plants with 900MW, 1,300MW and N4 reactors)

Until 2013, provisions were estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost for decommissioning expressed in €/MW, confirming the assumptions defined in 1979 by the PEON commission. These estimates had been confirmed from 2009 by a detailed study of decommissioning costs conducted by EDF at the representative site of Dampierre (four 900MW units), and its results were corroborated by an intercomparison with the study carried out by consultants La Guardia, based mainly on the Maine Yankee reactor in the US.

In 2014 the Dampierre study was reviewed by EDF to make sure that the previous calculations were still valid in view of recent developments and experience, both internationally and internally. For this revision, the decommissioning provisions for plants in operation were based on costs resulting from the Dampierre study, in order to incorporate best estimates and experience from inside and outside France. This change of estimate had no significant impact on the level of provisions at 31 December 2014.

Between June 2014 and July 2015, an audit of dismantling costs for EDF's nuclear fleet currently in operation was conducted by specialised consulting firms, at the request of the French Department for Energy and Climate (Direction Générale de l'Énergie et du Climat or DGEC). On 15 January 2016 the DGEC published a summary of the audit report. It stated that although estimating the cost of decommissioning nuclear reactors is a demanding exercise due to relatively limited past experience, the prospects of changes in techniques, and the distant timing of the expenditure, overall, the audit confirmed EDF's estimate of decommissioning costs for its nuclear fleet currently in operation. The DGEC also made a number of recommendations to EDF following this audit.

In 2016, EDF revised the decommissioning estimate, in order to incorporate the audit recommendations and past experience gained from dismantling operations for first-generation reactors (particularly Chooz A).

A detailed analytical approach was used to revise this estimate, identifying all costs for the engineering, construction work, operation and waste processing involved in future decommissioning of reactors currently in operation. This led to figures based on detailed timetables for plant decommissioning. The approach adopted made it possible to explore more thoroughly the assessment of costs specific to the initial units of each series, estimated for each series based on transposition coefficients applied to the baseline costs for the initial 900MW unit, and the series and mutualisation effects, as these costs and effects are inherent to the fleet's size and configuration.

The natures of the principal series and mutualisation effects used to arrive at the estimate are explained below.

Series effects (effects of work for the first-of-a-kind site on the following sites of the same series) are mainly of two types:

- first, in a fleet using the same technology, many of the studies do not need to be repeated each time;
- second, in a fleet using the same technology, robots and tooling can be largely reused from one site to another.

Mutualisation effects (effects between units in the same site, whether in operation or being decommissioned) are of several different types:

- some of them relate to the fact that several reactors may share common buildings and facilities on the same site, and these buildings and facilities will not have to be dismantled twice;
- certain costs are not higher when two or four reactors are dismantled on the same site. This is usually the case for surveillance costs, common equipment, and the cost of maintaining safe operating conditions on the site.

Due to mutualisation effects, dismantling a pair of reactors on the same site costs less than dismantling two standalone reactors on two different sites. In France, unlike other countries, there are no single reactors but sites with two or four, and in one case six reactors.

Series and mutualisation effects reduce the estimated decommissioning cost by 10% and 6% respectively compared to an estimate that ignores these effects. Series and mutualisation effects vary depending on the series: they are greater when there are more units in a series (series effect) and more units on a site (mutualisation effect), leading to a combined effect (series and mutualisation effect) of over 16% for the 900MW series.

In particular, series and mutualisation effects explain why it is not appropriate simply to compare the average dismantling cost per reactor between the French fleet and other countries' nuclear fleets.

In contrast, the estimates only marginally reflect changes in productivity and the learning effect. The external audit of the decommissioning cost for the fleet currently in operation, ordered by the DGEC, considered that this approach resulted in a prudent estimation method.

For reasons of prudence, the estimate also includes an assessment of risks and uncertainties as follows:

- incorporation of uncertainties relating to each "elementary" block of costs, series effects, mutualisation effects, transposition coefficients and fleet expenses;
- incorporation of risks, corresponding to the completion risks (which are identifiable and quantifiable, but only contingent). These risks are currently being assessed in detail based on the initial 900MW unit (Fessenheim). Until the results are released, the financial impact of the risks and opportunities is included *via* a flat-rate increase.

The above method for assessing risks and uncertainties leads to an overall margin of some 16.5% for the whole fleet (20% for the first 900MW unit).

This approach, adopted in 2016, and its results were presented to the administrative authority and gave rise to further questions and discussions.

The results of this detailed approach led to limited changes overall in the cost estimate and the associated provisions at 31 December 2016, apart from the consequences of the change in the depreciation period for 900MW series plants (excluding Fessenheim) at 1 January 2016, and the effect of changes in discount rates at 31 December 2016, *i.e.*:

- an increase of €321 million in the estimated decommissioning costs and an increase of €334 million in the estimated cost of long-term management of long-lived medium-level waste;
- a decrease of €(451) million in the provision for plant decommissioning, and an increase of €162 million in the provision for long-term management of long-lived medium-level waste, with corresponding changes in the underlying assets.

After its revision in 2016, it was decided that the cost estimate would be reviewed annually. Reviews since 2017 have led to non-significant annual adjustments to this estimate.

EDF continues to confirm its analyses through an international intercomparison, taking care to identify and characterise a number of factors that could distort direct comparisons, for example differences in the scope concerned by the cost estimate, or national and regulatory contexts.

In 2020, in addition to reclassification of the amount concerning the Fessenheim plant to the provision for decommissioning of permanently shut-down plants, the following changes were made to the provisions for decommissioning of nuclear plants currently in operation:

- the scope of these provisions includes the cost of demolishing back-up diesel facilities used in the *Grand Carénage* programme in 2020, resulting in a €23 million increase in the provision;
- as explained in note 1.3.4.2, the final adoption of France's multi-year energy programme (PPE) in April 2020 led to recognition in the Group's financial statements of the impact of the two early reactor shutdowns to take place in 2027 and 2028 before their fifth ten-year inspection. Nuclear provisions were re-estimated based on various possible shutdown scenarios, resulting in a €32 million increase in these provisions (€26 million of which concerned provisions for decommissioning of nuclear plants in operation) *via* an adjustment to balance sheet assets, as announced in note 4.1 to the financial statements at 31 December 2019;
- following the reclassifications presented in note 15.1.1 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, an amount of €813 million corresponding to the cost of interim storage and processing of steam generators in a centralised facility was reclassified to provisions for long-term radioactive waste management.

Based on the estimates of the different types of cost, the benchmark cost to completion (in 2020 euros) for decommissioning of the first two 900MW units (Fessenheim) amounts to approximately €0.8 billion, giving an average of €0.4 billion per initial 900MW unit, compared to an average cost of €0.35 billion for the entire PWR fleet, including the series and mutualisation effects described above.

For permanently shut-down nuclear power plants

Except for the two reactors at the Fessenheim plant (for which provisions are estimated under the approach used for the PWR fleet in operation described above), decommissioning of shut-down reactors involves pilot operations corresponding to four different technologies, each with clear specificities: a PWR reactor at Chooz A (but located in a cave), UNGG (natural uranium graphite gas-cooled) reactors at Bugey, Saint-Laurent and Chinon, a heavy water reactor at Brennilis, and a sodium-cooled fast neutron reactor at Creys-Malville.

The decommissioning costs are based on contractor quotes, which take account of accumulated industrial experience, unforeseeable and regulatory developments, and the latest available figures. They have been revised annually since 2015. In 2015 the industrial decommissioning strategy for UNGG plants was totally revised. The previously selected strategy was based on a scenario involving "underwater" dismantling of caissons (UNGG reactor buildings) for four of the reactors, with direct graphite storage in a centre currently under examination by ANDRA (see note 15.1.1.2.2 "Long-lived low-level waste"). Several new technical developments showed that the alternative "in-air" dismantling solution for the caissons would improve industrial control of operations and was apparently more favourable in terms of safety, radioprotection and environmental impact. The Company therefore selected a new "in-air" dismantling scenario as the benchmark strategy for all six caissons. This scenario includes a consolidation phase, building on experience acquired from dismantling the first caisson before beginning work on the other five. The decommissioning phase will ultimately be longer than previously planned, leading to a higher estimated cost due to the induced operating charges.

Updating the industrial decommissioning scenario for permanently shut-down power plants, particularly UNGG plants, led to a €590 million increase in the provision at 31 December 2015.

The review of decommissioning provisions for permanently shut-down plants in 2016 led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). In 2017 and 2018, this annual review gave rise to non-significant adjustments.

The amended industrial scenario for dismantling of the UNGG reactors in 2015 was presented to the ASN's commissioners on 29 March 2016. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. A consensus was reached regarding "in-air" dismantling for all reactors, the usefulness of an industrial demonstrator, and the timetable for dismantling the first-of-a-kind reactor (Chinon A2), but discussions continued regarding the dismantling timetable for the other 5 reactors. EDF's proposed schedule allowed for significant experience-based adjustments (after dismantling the first reactor) before beginning almost simultaneous dismantling of the other 5 reactors. On 12 February 2019, EDF presented all the information justifying the Group's chosen timetable to the ASN's commissioners. The ASN then issued draft decisions that were submitted to public consultation between July and November 2019, setting the deadline for filing regulatory applications for authorisation of dismantling work, and the dismantling schedule to be included in the applications. In those draft decisions, the ASN acknowledged that the required operations are complex, and that EDF's proposed risk control strategy (industrial demonstrator, significant experience with a first reactor) is justified. However, it asked for work on the five reactors after the first-of-a-kind reactor to be brought forward slightly and begin no later than 2055.

In view of the ASN's draft decisions, the nuclear provisions were increased in 2019 by a total €108 million: €77 million for decommissioning provisions for permanently shut-down nuclear power plants and €31 million for provisions for long-term radioactive waste management (long-lived low-level waste, very low-level and low and medium-level waste).

The ASN's decisions concerning dismantling of UNGG reactors were published on 17 March 2020 and did not contradict the principles of the draft decisions of 2019. Consequently, the nuclear provisions for decommissioning of UNGG plants were not subjected to any particular reestimation in 2020, and they reflect the best estimate of the industrial and technical scenario.

In 2020, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €45 million increase in provisions due to critical path delays following suspension of work during France's first lockdown phase, and a major unforeseen event associated with suspension of segmentation work on vessel internals at Chooz A. The costs for decontamination of civil engineering work were also updated, leading to a €43 million increase in provisions for the entire scope of permanently shut-down plants.

Finally, in accordance with its powers under Article 594-4 of the Environment Code, in June 2020 the DGEC commissioned an external audit of the valuation of dismantling operations for EDF's permanently shut-down nuclear facilities, conducted by a consortium of specialist firms. This audit began in December 2020 and will continue until July 2021.

At 31 December 2020, the gross amounts estimated under year-end economic conditions (amounts still to be spent) and the present value of those amounts are as follows, presented by type of reactor technology:

	31/12/2020	
(in millions of euros)	**Costs based on year-end economic conditions**	**Amounts in provisions at present value**
Pressurised water reactor – PWR – Chooz A	215	176
Pressurised water reactor – PWR – Fessenheim*	810	689
Natural uranium graphite gas-cooled reactors – UNGG – Bugey, Saint Laurent, Chinon	5,352	2,967
Heavy water reactor – Brennilis	321	276
Sodium-cooled fast neutron reactor – Superphenix at Creys Malville	557	494

** Excluding interim storage and processing of steam generators.*

Provisions for decommissioning of permanently shut-down nuclear plants also cover dismantling costs for related facilities such as the APEC Fuel Storage Workshop at Creys-Malville and the BCOT Operational Hot Unit at Tricastin.

Compared to decommissioning costs for the PWR technology, the cost at completion (all costs both settled and remaining) for decommissioning of the other reactors is higher, to different extents depending on their specific characteristics:

- costs are around twice as high for Brennilis (completion cost of approximately €0.85 billion for one reactor) due to its compactness, the fact that the core is encased in concrete and thus difficult to access, the absence of a fuel pool, which complicates remote-controlled segmentation, and the presence of zircaloy (a fire hazard), meaning that segmentation work takes longer and must be more closely supervised;
- costs are around twice as high for UNGG reactors (completion cost of approximately €6.4 billion for six reactors), because they require removal of 20 times more material than a PWR due to their size, and contain graphite which is hard to access and requires special handling such that specific remote-controlled equipment must be developed;
- costs are around four times as high for Creys-Malville (completion cost of approximately €1.8 billion for one reactor), due to processing of sodium for which elimination is very sensitive, and the size of the facilities, especially the reactor (with a vessel 20 times bigger than the vessel of the 1300MW PWR).

The following progress has been made on decommissioning work:

- Chooz A: the reactor was shut down in 1991 and nuclear dismantling began in 2007 after the dismantling decree was issued. The final stage of dismantling began in 2016 and involves segmentation, conditioning and removal of reactor vessel internals, followed by dismantling of the vessel itself. These operations are due to be completed in 2024. The dismantling decree requires them to be followed by a period of surveillance of the runoff water from the cave for twenty years, meaning that declassification of the facility would occur in 2047;
- UNNG reactors: these six reactors were shut down between 1973 and 1994 and received their dismantling decrees between 2008 and 2010 (except for Chinon A1 and A2). Fuel removal and circuit draining have been completed for all these reactors, and dismantling operations are in process for the conventional and nuclear buildings in the periphery of the "reactor caissons". Following the ASN's decision of 2020, applications for dismantling permits will be submitted for all these reactors in 2022, to obtain new decrees allowing continuation of dismantling operations according to an "in-air" strategy. Opening of the top part of the first UNGG reactor caisson – Chinon A2 – is expected in 2033: the initial extractions of vessel internals and graphite blocks are due to start in 2040 and last 14 years. In parallel, the other UNGG sites are finalising their work to put the sites into a safe storage configuration (by 2035). A safe storage configuration state means that 80% of surfaces have been dismantled and the reactor caissons awaiting dismantling are safe: this will allow sufficient progress on the first reactor in this series to gain experience and ensure safety for the other five operations. Opening of the caissons after the first UNGG decommissioning is scheduled to take place in or after 2055;

- Creys Malville: this plant was shut down in 1998 and received its dismantling decree in 2006. The following key stages have been completed: removal of the fuel, dismantling of the machine room, drainage of the circuits, processing and elimination of the sodium used for cooling in all circuits, filling the reactor vessel, opening and extracting the vessel caps, and the start of dismantling of the core vessel cap (which weighs several hundred tonnes). The next stages are dismantling the vessel internals (due to be completed in 2026), electromechanical dismantling in the reactor building, then decontamination (dismantling should end in 2038);
- Brennilis: this plant was shut down in 1985 and received a partial dismantling decree in 2011 allowing dismantling of all installations peripheral to the "reactor block". The following key stages have been completed: removal of the fuel, dismantling of the machine room, the fuel building, auxiliary buildings, heat exchangers and the effluent treatment station. The next stages are examination of the application for full dismantling authorisation, with a view to obtaining a dismantling decree in 2022 that would enable EDF to dismantle the reactor block (the end of these operations is currently forecast at 2040).

15.1.1.4 Provisions for last cores

These provisions cover the future expenses resulting from scrapping fuel that will only be partially irradiated when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints ("front-end" expenses);
- the cost of fuel processing, and waste removal and storage operations ("back-end" expenses). These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provisions from the commissioning date and an asset associated with the provision is recognised. In a decision of 11 December 2020, France's Council of State challenged the tax-deductibility of the consequences of immediate recognition of a provision for dismantling of the last core ("front-end" last core expenses) (see note 17.3.1).

In 2020 after the Fessenheim plant was definitively shut down, €99 million of the provision for last cores, concerning the two reactors at Fessenheim, was reversed with a corresponding reduction in the inventories of non-irradiated fuel in the reactor at the time of the shutdown, and in parallel, provisions for spent fuel management and long-term radioactive waste management were recognised for the cost of processing this fuel and storage of the waste that will result.

15.1.1.5 Discount rate, inflation and sensitivity analyses

Calculation of the discount rate and inflation rate

Until 30 June 2020, the discount rate was based on the sliding 10-year average yield on French OAT 2055 treasury bonds which have a similar duration to the obligations, plus the spread of corporate bonds rated A to AA.

As of 31 December 2020, the methodologies used to determine the discount rate changed as follows:

The discount rate is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (OAT bond 0-20 year curve) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) – with yields that become close to the UFR after 50 years – plus a curve of the spread of corporate bonds rated A to BBB. Based on the disbursements expected to meet nuclear obligations, a single equivalent discount rate is deduced by applying the discount rates from the interest rate curve constructed in this way to each flow as appropriate to its maturity. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.

The UFR was defined by the European Insurance and Occupational Pensions Authority (EIOPA) for very long-term insurance liabilities that will involve disbursements beyond market horizons. The UFR calculated for 2020 is 3.51%. This is used in the calculation methodology, in compliance with the decision by the French authorities, which in the ministerial order of 1 July 2020 amending the order of 21 March 2007 on secure financing of nuclear expenses (see below) changed the formula of the regulatory ceiling for the discount rate, such that it now refers to the UFR instead of the arithmetic 48-month average of the TEC 30-year rate. The UFR is considered more relevant for nuclear provisions in view of the very long-term maturities. The sovereign yield curve indicates rates in a range of [-0.6%; 0.2%] for outflows between 0 and 20 years, [0.2%; 3.2%] for outflows between 20 and 50 years, and a rate moving towards 3.51% for outflows after 50 years.

This change in calculation methodology for the discount rate provides the best assessment of the time value of money with regard to nuclear provisions, which are characterised by very long-term disbursement outflows, well beyond market horizons. This assessment is largely achieved through:

- use of an interest rate curve based on observed year-end market data with liquid horizons, converging over non-liquid horizons towards a very long-term rate with no cycle effect (instead of an average rate concerning a single duration corresponding to the average duration of the obligations), *i.e.* yield data for all the maturities associated with nuclear provisions;
- use of a very long-term rate (calculated UFR) produced by an independent body and now adopted by the French authorities in setting the formula for regulatory ceiling, to take account of long trends in yield movements, in coherence with the distant disbursement horizon;
- a change in the references of the bond spread to include corporate bonds rated A to BBB by ratings agencies, in order to construct a robust spread curve since there are few AA-rated bonds, particularly on long maturities, whereas most "Investment Grade" bonds are BBB-rated bonds and the great majority of them have longer maturities.

The inflation assumption is based on an inflation curve constructed by reference to inflation-indexed market products and economic forecasts, in long-term coherence with the inflation assumption underlying the UFR (2%).

The discount rate determined is thus 3.3% at 31 December 2020, assuming inflation of 1.2% (3.7% and 1.4% respectively at 31 December 2019), giving a real discount rate of 2.1% at 31 December 2020 (2.3% at 31 December 2019).

Based on the calculation method used until 30 June 2020, the real discount rate would also be 2.1%.

Regulatory discount rate limit

Following the letter dated 12 February 2020 from the Minister for the Ecological and Inclusive Transition and the Minister of the Economy and Finance informing EDF of their decisions to change certain regulations regarding secure financing of nuclear expenses (see note 32.1.5.1 to the financial statements at 31 December 2019), the following were published in the *Journal Officiel* of 2 July 2020:

- the decree of 1 July 2020 on secure financing for nuclear expenses, codifying and updating the initial decree of 23 February 2017;
- the ministerial order of 1 July 2020 on secure financing for nuclear expenses, amending the initial ministerial order of 21 March 2007.

This decree and ministerial order require the discount rate to comply with two regulatory limits from 1 July 2020. It must be lower than:

- a regulatory maximum, now expressed in real value, *i.e.* net of inflation; this value is equal to the unrounded value representative of expectations concerning the real long-term interest rate, as used for the calculation of the Ultimate Forward Rate (UFR) applicable at the date concerned published by the European Insurance and Occupational Pensions Authority (EIOPA), plus 150 bp. This maximum is applicable from 2024. Until 2024, the maximum is the weighted average of 2.3% and the above calculation. The weighting applied to the 2.3% rate is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023; and
- the expected rate of return on assets covering the liability (dedicated assets).

The maximum discount rate under the new ministerial order effective from 1 July 2020, calculated by reference to the UFR, is 2.7% (real rate of 2.66% rounded up to 2.7%) at 31 December 2020.

The real discount rate used in the financial statements at 31 December 2020, in application of the methodologies presented above, is 2.1%.

The maximum discount rate in nominal value, based on the regulation applicable before the ministerial order of 1 July 2020 and calculated by reference to TEC 30 rates, was 3.8% (3.75% rounded up to 3.8%) at 31 December 2019. The nominal discount rate used in the financial statements at 31 December 2019 was 3.7%.

The decree of 1 July 2020 also introduced the following additional changes:

- it removed the obligation to add to dedicated assets when the coverage rate of obligations is above 100%, and raised the threshold above which withdrawals can be made from dedicated assets from 110% to 120%;
- it extended the period for making additions to dedicated assets in the event of a shortfall in coverage, after approval by the administrative authority, to 5 years compared to 3 previously;
- it added requirements for internal control and risk analysis on nuclear provisions, which operators must implement by 31 December 2021.

Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, long-term discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

Provisions related to nuclear generation within the scope of the Law of 28 June 2006	31/12/2020		31/12/2019	
(in millions of euros)	Costs based on year-end economic conditions	Amounts in provisions at present value	Costs based on year-end economic conditions	Amounts in provisions at present value
Spent fuel management	18,998	10,246	18,437	9,804
● *amount unrelated to the operating cycle*	*2,727*	*1,297*	*2,491*	*1,152*
Waste removal and conditioning	-	-	1,243	805
Long-term radioactive waste management	35,580	13,300	32,372	10,531
BACK-END NUCLEAR CYCLE EXPENSES	**54,578**	**23,546**	**52,052**	**21,140**
Decommissioning of nuclear plants in operation	19,693	12,775	21,134	13,244
Decommissioning of shut-down nuclear plants	7,400	4,714	6,428	3,693
Last cores	4,258	2,711	4,331	2,624
DECOMMISSIONING AND LAST CORE EXPENSES	**31,351**	**20,200**	**31,893**	**19,561**
PROVISIONS RELATED TO NUCLEAR GENERATION within the scope of the law of 28 June 2006		**43,746**		**40,701**

The cumulative disbursements of nuclear expenses (based on gross values at year-end economic conditions) are distributed as follows:

Provisions related to nuclear generation within the scope of the Law of 28 June 2006	31/12/2020		
	Costs based on year-end economic conditions		
(in millions of euros)	Disbursement expected within 10 years	Disbursement expected after 10 years*	Total
Spent fuel management	7,176	11,822	18,998
● *amount unrelated to the operating cycle*	*239*	*2,488*	*2,727*
Long-term radioactive waste management	5,094	30,486	35,580
BACK-END NUCLEAR CYCLE EXPENSES	**12,270**	**42,308**	**54,578**
Decommissioning of nuclear plants in operation	707	18,986	19,693
Decommissioning of shut-down nuclear plants	2,756	4,644	7,400
Last cores	848	3,410	4,258
DECOMMISSIONING AND LAST CORE EXPENSES	**4,311**	**27,040**	**31,351**

* *Over a 20-year and 50-year horizon, 22% and 40% respectively of cumulative disbursements (at year-end economic conditions) will concern long-term radioactive waste management provisions, and 47% and 96% respectively will concern decommissioning provisions.*

This approach can be complemented by estimating the impact of a change in the discount rate on the present value.

The following table reports these details for the main components of EDF's provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

At 31 December 2020

(in millions of euros)	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
		+0.20%	-0.20%	+0.20%	-0,20%
Back-end nuclear cycle expenses:					
● spent fuel management	11,322	(261)	287	229	(253)
● waste removal and conditioning	-				
● long-term radioactive waste management	13,300	(793)	954	646	(796)
Decommissioning and last core expenses:					
● decommissioning of nuclear plants in operation	12,775	(498)	522	-	-
● decommissioning of shut-down nuclear plants	4,714	(160)	172	160	(172)
● last cores	2,711	(91)	97	-	-
TOTAL	**44,822**	**(1,803)**	**2,032**	**1,035**	**(1,221)**
Amount covered by dedicated assets	***32,676***	***(1,564)***	***1,772***	***875***	***(1,043)***

At 31 December 2019

(in millions of euros)	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
		+0.20%	-0.20%	+0.20%	-0,20%
Back-end nuclear cycle expenses:					
● spent fuel management	10,823	(228)	249	196	(215)
● waste removal and conditioning	805	(25)	27	16	(17)
● long-term radioactive waste management	10,531	(659)	750	554	(636)
Decommissioning and last core expenses:					
● decommissioning of nuclear plants in operation	13,244	(506)	529	7	(7)
● decommissioning of shut-down nuclear plants	3,693	(139)	150	139	(150)
● last cores	2,624	(88)	94	-	-
TOTAL	**41,720**	**(1,645)**	**1,799**	**912**	**(1,025)**
Amount covered by dedicated assets	***29,975***	***(1,423)***	***1,559***	***769***	***(868)***

15.1.2 EDF's dedicated assets

15.1.2.1 Regulations

Article L. 594 of France's Environment Code and its implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste. These regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. Dedicated assets are clearly identified and managed separately from the Company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The law requires the realisable value of dedicated assets to be higher than the value of the provisions corresponding to the present value of the long-term nuclear expenses defined in France's Environment Code.

The Decree of 1 July 2020 codified the regulatory obligations concerning dedicated assets in Articles D. 594-1 to 18 of the Environment Code, complemented by the ministerial order of 21 March 2007 amended by the order of 1 July 2020. These documents define the list of eligible assets, which is largely based on France's Insurance Code and includes unlisted assets subject to certain conditions. In particular, they authorise allocation to dedicated assets of the shares of CTE, which has held 100% of the capital of RTE since 31 December 2017 (see note 15.1.2.2 below).

EDF received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

Since the decree of 1 July 2020, apart from the obligation to allocate €797 million to dedicated assets in 2020 as a result of the previous regulations, which was confirmed to EDF by a letter from the administrative authority on 12 February 2020, EDF is no longer obliged to add to dedicated assets when the coverage rate of obligations, determined by the ratio of the assets' realisable value to the amount of the provisions concerned, is above 100%, and withdrawals from assets are not authorised unless that rate is above 120%.

15.1.2.2 Strategic allocation and composition of dedicated assets

Given the regulations governing dedicated assets, they form a highly specific category of assets.

Dedicated assets are structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It takes into account regulatory constraints concerning the nature and liquidity of the dedicated assets, the financial outlook for the equity and bond markets, and the diversifying contribution of unlisted assets.

Several changes have been made to this strategic allocation, in order to pursue the diversification into unlisted assets:

- in 2010 the shares in RTE (now held *via* CTE) were allocated to dedicated assets;
- in 2013 an unlisted asset portfolio (consisting of infrastructures, real estate and debt or equity funds) was set up and is managed by EDF SA's "EDF Invest" Division; and
- in 2013 the receivable recognised by the French State was allocated to dedicated assets. This receivable represented the accumulated shortfall in CSPE financing at 31 December 2012, and was fully reimbursed at 31 December 2020.

On 29 June 2018 the Board of Directors validated the principle of strategic allocation for dedicated assets:

- yield assets (target of 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- growth assets (target of 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- fixed-income assets (target of 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually by 2025.

Growth assets and fixed-income assets

Certain growth and fixed-income assets take the form of bonds held directly by EDF. Others consist of specialised collective investment funds on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds located in France, established for the Company. The reserved funds are owned by EDF and are not consolidated as EDF does not participate in management of these funds and provides no financial support for them.

The value of the assets of the reserved investment funds amounts to €10,422 million at 31 December 2020 (€8,492 million at 31 December 2019). These funds mainly consist of 13 listed funds with total value of €9,742 million (at 31 December 2019, 12 listed funds with total value of €7,875 million).

The listed equity funds consist of international equities (mainly in North America but also in Europe, Asia-Pacific and emerging countries). Listed bonds and listed bond funds consist of sovereign and corporate bonds.

These investments are structured and managed in line with the strategic allocation, which takes into consideration international stock market cycles, for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led the Group to define a long-term investment policy with appropriate allocation between growth assets and fixed-income assets.

Growth assets also include a small portion of funds invested in unlisted equities, and fixed-income assets also include a small portion of funds invested in unlisted debt. These funds are managed by EDF Invest (see yield assets below).

At the year-end, dedicated assets are presented in debt and equity securities in the balance sheet, at their liquidation value.

In the course of operational asset monitoring, the Group applies long-term, specific management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

Yield assets

The yield assets managed by EDF Invest consist mainly of assets related to investments in infrastructures and real estate, made either directly by EDF Invest or by investment funds under delegated management arrangements.

Through unlisted investment funds, EDF Invest also manages growth assets and fixed-income assets.

At 31 December 2020, the assets managed by EDF Invest represent a total realisable value of €6,905 million, including €6,420 million of yield assets. Yield assets particularly include:

- 50.1% of the Group's shares in CTE, amounting to €2,788 million at 31 December 2020 (€2,926 million at 31 December 2019), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Madrileña Red de Gas (MRG), Géosel, Thyssengas, Aéroports de la Côte d'Azur, Energy Assets Group, Central Sicaf, Ecowest, Korian & Partenaires Immobilier, Nam Theun Power Company and companies that own wind and solar power plants (in the United States, Canada, United Kingdom, Portugal), presented in investments in associates in the consolidated balance sheet;
- the Group's investments in Teréga, Porterbrook, Autostrade per l'Italia, Q-Park and companies that own wind farms in the United Kingdom, presented in debt and equity securities in the consolidated balance sheet.

15.1.2.3 Changes in dedicated assets in 2020

In April 2020, EDF Invest acquired a minority interest in Energy Assets Group (EAG) in the United Kingdom (smart meters), and minority interests in real estate assets (office in France and healthcare properties in Europe).

In December 2020 EDF SA acquired investments in wind and solar power plants in the United States, Canada and Portugal from EDF Renewables. All these investments were allocated to dedicated assets in 2020, in addition to the allocation during the first half-year corresponding to the balance of the investment in the MiRose and Red Pine wind farms acquired from EDF Renewables in 2019.

Allocations to dedicated assets in 2020 totalled €797 million (€540 million in 2019), comprising €299 million in the form of asset contributions and €498 million in cash, in compliance with EDF's obligation for 2020 under the regulatory framework (see note 15.1.2.1).

The first half of 2020 saw an unprecedented situation on the financial markets. The equity markets rose significantly until mid-February, then the spread of the Covid-19 pandemic drew them into their sharpest downturn in more than 30 years. The lowest point was on 20 March but ultimately there was a strong recovery until the end of the half-year, largely stimulated urgent intervention by the central banks. Over this first half-year the portfolio registered negative changes in fair value, but the situation gradually improved and the year 2020 ended with good performances for all assets – particularly thanks to the exceptional budget and monetary measures taken to support the economy.

The US Federal Bank once again adopted a zero-rate policy, and the ECB introduced a quantitative easing programme on an unprecedented scale, involving assets of much lower quality than in previous quantitative easing campaigns. Consequently, contrary to expectations in the early part of the year, government bond yields declined significantly (-0.4% on the Bund 10-year yield to -0.58%, and -0.9% on BTP Italian government bonds to +0.52%). The year ended on a positive note as political uncertainties were lifted with the US Presidential elections, and most importantly a last-minute deal for Brexit.

Positive changes in the fair value of the dedicated asset portfolio (investment funds, equities) amounting to €1,218 million were recognised in the financial result in 2020 (see note 8.3), compared to positive changes amounting to €2,545 million in 2019.

Positive changes in the fair value of the bonds in the dedicated asset portfolio amounting to €62 million were recognised in OCI in 2020 (see note 18.1.2), compared to positive changes amounting to €162 million in 2019.

Withdrawals from dedicated assets in 2020 totalled €431 million, equivalent to payments made in respect of the long-term nuclear obligations to be covered during the year (€442 million in 2019).

15.1.2.4 Valuation of EDF's dedicated assets

EDF's dedicated assets are included in the Group's consolidated financial statements at the following values:

		31/12/2020		31/12/2019	
(in millions of euros)	**Consolidated balance sheet presentation**	**Book value**	**Realisable value**	**Book value**	**Realisable value**
Yield assets (EDF Invest)		**4,677**	**6,420**	**4,304**	**6,080**
CTE	Investments in associates [1]	1,378	2,788	1,417	2,926
Other associates	Investments in associates [2]	1,974	2,252	1,563	1,777
Other unlisted assets	Debt and equity securities and other net assets [3]	1,309	1,364	1,334	1,387
Derivatives	Fair value of derivatives	16	16	(10)	(10)
Growth assets		**13,692**	**13,692**	**13,300**	**13,300**
Equities (investment funds)	Debt securities	13,174	13,174	12,978	12,978
Unlisted equity funds (EDF Invest)	Debt securities	330	330	276	276
Derivatives	Fair value of derivatives	188	188	46	46
Fixed-income assets		**13,736**	**13,736**	**12,240**	**12,244**
Bonds	Debt securities	12,371	12,371	11,225	11,225
Unlisted debt funds (EDF Invest)	Debt securities	155	155	142	142
Cash portfolio	Debt securities	1,185	1,185	188	188
CSPE receivable [4]	Loans and financial receivables	-	-	684	688
Derivatives	Fair value of derivatives	25	25	1	1
TOTAL EDF DEDICATED ASSETS		**32,105**	**33,848**	**29,844**	**31,624**

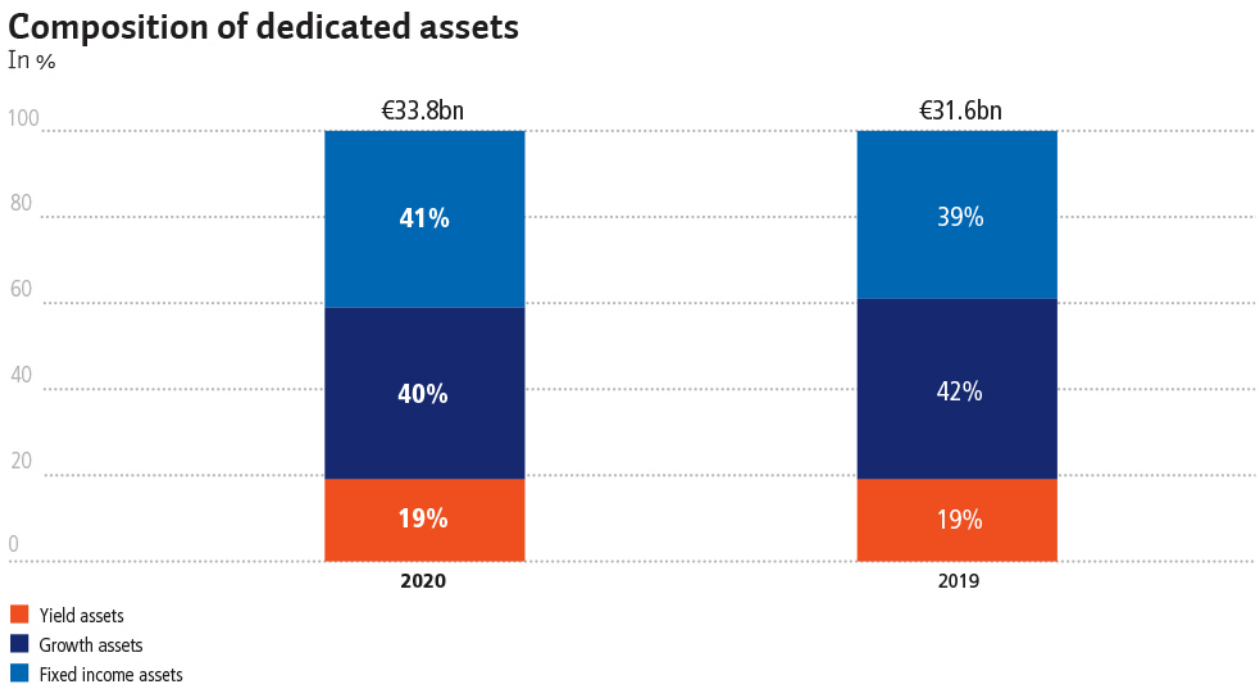
(1) The Group's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The CTE shares are included at their equity value in the consolidated financial statements (book value in the table). The realisable value of CTE in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets.

(2) Including the value of the share in equity of the controlled companies owning these investments.

(3) Including debt and equity securities amounting to €1,183 million and the value of the share in equity of other controlled companies.

(4) The receivable consisting of accumulated shortfalls in compensation at 31 December 2015, less the portion assigned on 22 December 2016 and reimbursements received since then. This receivable was fully reimbursed at 31 December 2020 in line with the repayment schedule.

The structure of the dedicated asset portfolio in 2020 and 2019 is as follows (in realisable value):



15.1.3 Coverage of EDF's long-term nuclear obligations

The Group's long-term nuclear obligations in France concerned by the regulations for dedicated assets related to nuclear generation are included in the EDF group's consolidated financial statements at the following values:

(in millions of euros)	31/12/2020	31/12/2019
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,297	1,152
Provisions for long-term radioactive waste management	13,300	10,531
Provisions for waste removal and conditioning	-	805
Provisions for nuclear plant decommissioning	17,489	16,937
Provisions for last cores – portion for future long-term radioactive waste management	590	550
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	**32,676**	**29,975**
REALISABLE VALUE OF DEDICATED ASSETS	**33,848**	**31,624**
REGULATORY COVERAGE RATE	**103.6%**	**105.5%**

At 31 December 2020, by the regulatory calculations provisions are 103.6% covered by dedicated assets. The regulatory caps on the realisable value of certain investments set in the Environment Code were respected at 31 December 2020.

At 31 December 2019, by the regulatory calculations provisions were 105.5% covered by dedicated assets and also respected these regulatory caps on realisable value.

15.2 EDF Energy's nuclear provisions

The specific financing terms for long-term nuclear obligations related to EDF Energy are reflected as follows in the EDF group's financial statements:

- the obligations are reported in liabilities in the form of provisions amounting to €15,280 million at 31 December 2020;
- in the assets, EDF Energy reports receivables corresponding to the amounts payable under the restructuring agreements by the NLF, for non-contracted obligations or decommissioning obligations, and by the British Government for contracted obligations (or historical liabilities).

These receivables are discounted at the same real rate as the obligations they are intended to finance. They are included in "Financial assets" in the consolidated balance sheet (see note 18.1.3) at the amount of €13,034 million at 31 December 2020 (€13,303 million at 31 December 2019).

Details of changes in provisions for the back-end of the nuclear cycle and provisions for decommissioning and last cores are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases	Discount effect	Translation adjustments	Other movements	31/12/2020
Provisions for spent fuel management	1,503	14	(206)	34	(79)	20	1,286
Provisions for waste removal and conditioning	532	3	-	10	(29)	30	546
Provisions for long-term radioactive waste management	1,053	3	-	53	(58)	55	1,106
Provisions for the back-end of the nuclear cycle	**3,088**	**20**	**(206)**	**97**	**(166)**	**105**	**2,938**
Provisions for nuclear plant decommissioning	10,303	-	(48)	168	(557)	304	10,170
Provisions for last cores	1,892	-	-	71	(106)	315	2,172
Provisions for decommissioning and last cores	**12,195**	**-**	**(48)**	**239**	**(663)**	**619**	**12,342**
PROVISIONS RELATED TO NUCLEAR GENERATION	**15,283**	**20**	**(254)**	**336**	**(829)**	**724**	**15,280**

Other movements include the changes in nuclear liabilities with a corresponding adjustment in the amount of reimbursements receivable from the Nuclear Liabilities Fund (NLF) and the British government, and the change in the provision for last cores *via* an adjustment to fixed assets.

The overall change mainly results from the decrease in the discount rate for an amount of €644 million, of which €322 million was recognised through the receivable representing reimbursements to be made by the Nuclear Liabilities Fund (NLF) and the British government, and €322 million recognised *via* an adjustment to fixed assets.

15.2.1 Regulatory and contractual framework

Amendments signed with the Nuclear Liabilities Fund (NLF – an independent trust set up by the UK Government as part of the restructuring of British Energy) following the EDF group's acquisition of British Energy had a limited impact on the contractual financing commitments made to British Energy by the UK Secretary of State and the NLF under the "Restructuring Agreements". These agreements were entered into by British Energy on 14 January 2005 as part of the restructuring led by the UK Government from 2005 in order to stabilise British Energy's financial position. These agreements were amended and restated on 5 January 2009 as part of the acquisition of the British Energy Generation Limited by the Group. British Energy Generation Limited changed its name to EDF Energy Nuclear Generation Limited on 1 July 2011 and replaced British Energy in these agreements and amendments.

Under the terms of the Restructuring Agreements:

- the NLF agreed to fund, to the extent of its assets: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for management of spent fuel from the Sizewell B power station); and (ii) qualifying decommissioning costs for EDF Energy's existing nuclear power stations;
- the Secretary of State agreed to fund: (i) qualifying contingent and/or latent nuclear liabilities (including liabilities for the management of spent fuel from the Sizewell B power station) and qualifying decommissioning costs related to EDF Energy's existing nuclear power stations, to the extent that they exceed the assets of the NLF; and (ii) subject to a cap of £2,185 million (in December 2002 monetary values, adjusted accordingly), qualifying known existing liabilities for EDF Energy's spent fuel (including liabilities for management of spent fuel from plants other than Sizewell B loaded in reactors prior to 15 January 2005);
- EDF Energy is responsible for funding certain excluded or disqualified liabilities (*e.g.* those defined as EDF Energy liabilities), and additional liabilities which could be created as a result of failure by EDF Energy to meet minimum performance standards under applicable law. The obligations of EDF Energy to the NLF and the Secretary of State are guaranteed by the assets of the principal members of EDF Energy.

EDF Energy also made commitments to pay:

- annual decommissioning contributions for a period limited to the useful life of the plants as at the date of the "restructuring agreements"; the corresponding provision amounts to €101 million at 31 December 2020;
- £150,000 (indexed to inflation) per tonne of uranium loaded in the Sizewell B reactor after the date of the "restructuring agreements".

Furthermore, EDF Energy entered into a separate contract with the Nuclear Decommissioning Authority (NDA) for management of AGR spent fuel and associated radioactive waste resulting from operation of power plants other than Sizewell B after 15 January 2005, and bears no responsibility for this fuel and waste once it is transferred to the processing site at Sellafield. The corresponding costs of £150,000 (indexed to inflation) per tonne of loaded uranium – plus a rebate or surcharge dependent on market electricity price and electricity generated in the year – are included in inventories (see note 13.1).

EDF Energy has been in discussions since 2019 with the UK government to agree changes and clarifications to the Restructuring Agreements to provide for efficient recovery of qualifying costs and clarity that once the AGR stations have finished defueling, they will transfer to the Nuclear Decommissioning Authority (NDA) for subsequent decommissioning activities.

EDF Energy in early 2020 submitted phase 1 of the decommissioning plan submission (DPS 20) which was an update to the defueling liability. The NDA response to the DPS 20 is expected as part of the conclusion in the discussions with the UK government.

The second phase of the DPS 20 should take place late 2021, it will involve updates of all the other decommissioning activities for the AGR plants and decommissioning of Sizewell. At the same time, there will also be an update to the uncontracted liability discharge plan.

15.2.2 Provisions for the back-end of the nuclear cycle

Spent fuel from the Sizewell B PWR (pressurised water reactor) plant is stored on site. Spent fuel from other plants is transferred to Sellafield for storage and reprocessing.

EDF Energy's provisions for the back-end of the nuclear cycle concern obligations for reprocessing and storage of spent fuel and long-term storage of radioactive waste, required by the existing regulations in the UK approved by the Nuclear Decommissioning Authority (NDA). Their amount is based on contractual agreements or if this is not possible, on the most recent technical estimates.

(in millions of euros)	31/12/2020 Costs based on year-end economic conditions	31/12/2020 Amounts in provisions at present value	31/12/2019 Costs based on year-end economic conditions	31/12/2019 Amounts in provisions at present value
Spent fuel management	2,318	1,286	2,655	1,503
Waste removal and conditioning	1,875	546	1,979	532
Long-term radioactive waste management	3,724	1,106	3,886	1,053
BACK-END NUCLEAR CYCLE EXPENSES	**7,917**	**2,938**	**8,520**	**3,088**

15.2.3 Provisions for nuclear plant decommissioning

Provisions for decommissioning of nuclear plants result from the Group management's best estimates. They cover the full cost of decommissioning and are measured on the basis of existing techniques and methods that are most likely to be used for application of current regulations.

As explained above, EDF Energy has been in discussions since 2019 with the UK government to agree changes and clarifications to the Restructuring Agreements, to provide for efficient recovery of qualifying costs and clarity that once the AGR stations have finished defueling, they will transfer to the Nuclear Decommissioning Authority (NDA) for subsequent decommissioning activities.

In early 2020, EDF Energy submitted phase 1 of the decommissioning plan submission (DPS 20) which was an update to the defueling liability. This led to a €1.9 billion increase in the provision at 31 December 2019, notably reflecting i) the extension of the defueling period following risk and contingency modelling, ii) better definition of the costs covered, and iii) an updated estimate of the costs of preparing and removing fuel, following a review of the industrial scenario. The NDA's response to the DPS 20 is expected as part of the conclusion in the discussions with the UK government.

The second phase of the DPS 20 should take place late 2021, and will involve updates of all the other decommissioning activities for the AGR plants and decommissioning of Sizewell. At the same time, there will also be an update to the uncontracted liability discharge plan.

During 2020, EDF Energy announced the closure of Hunterston and Hinkley Point B AGR stations, to take place no later than 7 January 2022 and 15 July 2022 respectively. The impact of this assumption update is immaterial in the context of the decommissioning liability.

(in millions of euros)	31/12/2020 Costs based on year-end economic conditions	31/12/2020 Amounts in provisions at present value	31/12/2019 Costs based on year-end economic conditions	31/12/2019 Amounts in provisions at present value
PLANT DECOMMISSIONING EXPENSES	**18,175**	**10,069**	**19,278**	**10,187**

The decrease in the costs based on year-end economic conditions is mainly explained by the effect of translation adjustments.

15.2.4 Discounting of EDF Energy's provisions related to nuclear generation

Until 30 June 2020, the discount rate was calculated using an average series of data for a sample of UK Government gilts over the longest available durations plus the spread of UK Corporate bonds rated A to AA, again over the longest-term duration. The implicit inflation rate used in determining a discount rate is based on a long-term forecast of adjusted retail prices (the UK's CPIH index).

As of 31 December 2020, the method used to determine the discount rate changed as follows:

- like the discount rate for nuclear provisions in France, the discount rate for EDF Energy's provisions is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (UK gilt 0-20 year yield) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) plus a curve of the spread of corporate bonds rated A to BBB. Based on expected disbursements corresponding to nuclear obligations, a single equivalent discount rate is deduced from the curve constructed in this way. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions;
- the inflation assumption is based on an inflation curve constructed by reference to economic forecasts and inflation-indexed market products, in long-term coherence with the inflation assumption underlying the UFR (2%).

The real discount rate determined in this way and applied by EDF Energy at 31 December 2020 for calculation of its nuclear obligations is 1.8% (2.0% at 31 December 2019).

15.3 Nuclear provisions in belgium

In Belgium, the Belgian law of 11 April 2003 assigned management of provisions concerning the Belgian nuclear plants, and the funds that cover them, to Synatom (a subsidiary of the ENGIE group). Luminus contributes *via* Synatom to these funds, to cover its share of plant decommissioning and back-end nuclear fuel expenses as a co-owner of 4 nuclear plants. These funding mechanisms are reflected through the following items in the consolidated financial statements:

- obligations presented in the liabilities in the form of provisions, amounting to €265 million at 31 December 2020 (€259 million at 31 December 2019);
- a receivable representing the advance payments made to Synatom, recognised in the consolidated balance sheet assets as financial assets carried at fair value (see note 18.1.3) at the value of €263 million at 31 December 2020 (€230 million at 31 December 2019). This receivable, which corresponds to the fair value of the share of funds held by Synatom on behalf of Luminus, is discounted by applying the same real discount rate used to determine the obligations they will cover.

Other provisions related to nuclear generation in Belgium correspond to liabilities covered by provisions that are not part of the mechanisms described above.

Note 16 Provisions for employee benefits

Accounting principles and methods

The Group grants its employees post-employment benefits (pension plans, retirement indemnities, etc.) and other long-term benefits (*e.g.* long-service awards) in compliance with the specific laws and measures in force in each country where it does business.

Calculation and recognition of employee benefits

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end under all types of plan, taking into consideration the prospects for wage increases and each country's specific economic conditions.

Post-employment benefit obligations are valued mainly using the following methods and assumptions:

- retirement age, determined on the basis of the applicable rules for each plan, and the requirements to qualify for a full pension;
- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data available in each country;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate;
- a discount rate that depends on the geographical zone and the duration of the obligations, determined at the year-end date by reference to the market yield on high-quality corporate bonds or the rate on government bonds whose duration is coherent with EDF group's commitments to employees.

The amount of the provision corresponds to the value of obligations less the fair value of the fund assets that cover those obligations.

The net expense booked during the year for employee benefit obligations includes:

- in the income statement:
  - the current service cost, corresponding to additional benefit entitlements earned during the year,
  - the net interest expense, corresponding to interest on obligations net of the return on fund assets, which is calculated using the same discount rate as for the obligations,
  - the past service cost, including the income or expense related to amendments or settlements of benefit plans or introduction of new plans,
  - the actuarial gains and losses relating to other long-term benefits;
- in other components of consolidated comprehensive income:
  - the actuarial gains and losses relating to post-employment benefits and any return on hedging assets in excess of the discount rates used,
  - the effect of the limitation to the asset ceiling if any.

Post-employment benefit obligations

When they retire, Group employees benefit from pensions determined under local rules. They may also be entitled to benefits directly paid by the companies, and additional benefits prescribed by the relevant regulations.

French entities covered by the IEG system

Entities belonging to the specific IEG (electricity and gas) sector system, namely EDF, Enedis, Électricité de Strasbourg, EDF PEI and certain subsidiaries of the Dalkia subgroup, are Group companies where almost all employees benefit from the IEG statutes, including the special pension system and other statutory benefits.

After the financing reform for the IEG sector system took effect on 1 January 2005 (law of 9 August 2004), pension provisions were recognised by IEG companies to cover entitlements not funded by France's standard systems (CNAV, AGIRC and ARRCO), to which the IEG system is affiliated, or by the CTA (*contribution tarifaire d'acheminement*) levy on gas and electricity transmission and distribution services.

As a result of the system affiliation mechanism, any change (whether favourable or unfavourable to employees) in the standard French pension system that is not passed on to the IEG pension system is likely to cause a variation in the amount of the provisions recorded by the Group to cover its obligations.

The obligations concerned by the pensions and for which a provision is recorded thus include:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (transmission and distribution) (benefits earned prior to that date are financed by the CTA levy).

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind: Article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at preferential prices. The obligation for supplies of energy to employees of the EDF and ENGIE (formerly GDF-Suez) groups corresponds to the probable present value of kWh to be supplied to beneficiaries or their dependants during their retirement, valued on the basis of the unit cost. It also includes the payment made under the energy exchange agreement with ENGIE;
- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy;
- bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26 - § 5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension, subject to a ceiling) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include help with the cost of studies, time banking for pre-retirement leave, and pensions for personnel sent on secondment to subsidiaries not covered by the IEG system.

French and foreign subsidiaries not covered by the special IEG system

Pension obligations principally relate to the British companies and are mostly covered by defined-benefit plans.

In the United Kingdom, EDF Energy has three principal defined-benefit pension plans:

- the British Energy Generation Group (BEGG) plan affiliated to the Electricity Supply Pension Scheme (ESPS), of which the majority of members are employees in Nuclear Generation. The BEGG plan was closed to new members in August 2012;
- the EDF Energy Generation and Supply Group (EEGSG) plan, also affiliated to the ESPS, which was established in December 2010 for the employees remaining with EDF Energy following the transfer of the former Group plan to UK Power Networks as part of the sale of the Networks. The EEGSG plan has not accepted any new members since then;
- the EDF Energy Pension Scheme (EEPS). This scheme was established in March 2004 and membership remains open to new employees.

Each pension plan is financially independent of the others. The BEGG and EEGSG plans are part of the industry-wide ESPS which is one of the largest private-sector pension schemes in the United Kingdom.

Other long-term benefit obligations

These benefits concern employees currently in service, and are earned according to local regulations, particularly the statutory regulations for the electricity and gas sector for EDF and French subsidiaries covered by the IEG regime. They include:

- annuities following incapacity, invalidity, industrial accident or work-related illness;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

16.1 Group provisions for employee benefits

(in millions of euros)	31/12/2020	31/12/2019
Provisions for employee benefits – current portion	879	945
Provisions for employee benefits – non-current portion	22,130	20,539
PROVISIONS FOR EMPLOYEE BENEFITS	**23,009**	**21,484**

16.1.1 Breakdown of the change in the provision by geographical area: obligations, fund assets, net liability

(in millions of euros)	France [1]	United Kingdom	Others	Total
Obligations at 31/12/2019	**33,310**	**9,690**	**899**	**43,899**
Net expense for 2020	1,241	456	39	1,736
Actuarial gains and losses	2,356	896	41	3,293
Employer's contributions to funds	-	-	-	-
Employees' contributions to funds	-	9	-	9
Benefits paid [2]	(1,418)	(404)	(25)	(1,847)
Translation adjustment	-	(530)	(2)	(532)
Other movements	-	-	-	-
OBLIGATIONS AT 31/12/2020	**35,489**	**10,117**	**952**	**46,558**

(in millions of euros)	France [1]	United Kingdom	Others	Total
Fund assets at 31/12/2019	**(12,581)**	**(10,712)**	**(368)**	**(23,661)**
Net expense for 2020	(160)	(215)	(3)	(378)
Actuarial gains and losses	(1,204)	(1,179)	(7)	(2,390)
Employer's contributions to funds	-	(283)	(25)	(308)
Employees' contributions to funds	-	(9)	-	(9)
Benefits paid	475	404	4	883
Translation adjustment	-	588	1	589
FUND ASSETS AT 31/12/2020	**(13,470)**	**(11,406)**	**(398)**	**(25,274)**

(in millions of euros)	France [1]	United Kingdom	Others	Total
Net employee benefit liability at 31/12/2019 [2]	**20,729**	**(1,022)**	**531**	**20,238**
Net expense for 2020	1,081	241	36	1,358
Actuarial gains and losses	1,152	(283)	34	903
Employer's contributions to funds	-	(283)	(25)	(308)
Employees' contributions to funds	-	-	-	-
Benefits paid	(943)	-	(21)	(964)
Translation adjustment	-	58	(1)	57
Other movements	-	-	-	-
NET EMPLOYEE BENEFIT LIABILITY AT 31/12/2020	**22,019**	**(1,289)**	**554**	**21,284**
Including:				
Provisions for employee benefits				*23,009*
Non-current financial assets [3]				*(1,725)*

(1) France comprises the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 16.2).
(2) The net liability at 31 December 2019 comprised €21,484 million for the provisions for employee benefits and €(1,246) million of non-current financial assets, giving a net liability amount of €20,238 million.
(3) At 31 December 2020, EDF Energy recognised surplus funding on its EEGSG and BEGG pension schemes.

Actuarial gains and losses on obligations in 2020

Actuarial gains and losses on obligations amount to €3,293 million for 2020, including:

- €2,356 million in France as a result of:
  - the €2,695 million change in the discount rate,
  - the €(604) million change in the inflation rate;
- €896 million in the United Kingdom, essentially associated with changes in the discount and inflation rates (see note 16.1.2).

Actuarial gains and losses on obligations amount to €5,130 million for 2019, including:

- €4,151 million in France as a result of:
  - the €5,515 million change in the discount rate,
  - the €(926) million change in the inflation rate,
  - €(285) million due to the proposed law on social security system funding for 2020,
  - €(183) million due to an update of the wage law;
- €873 million in the United Kingdom, essentially associated with changes in the discount and inflation rates.

Actuarial gains and losses on fund assets in 2020

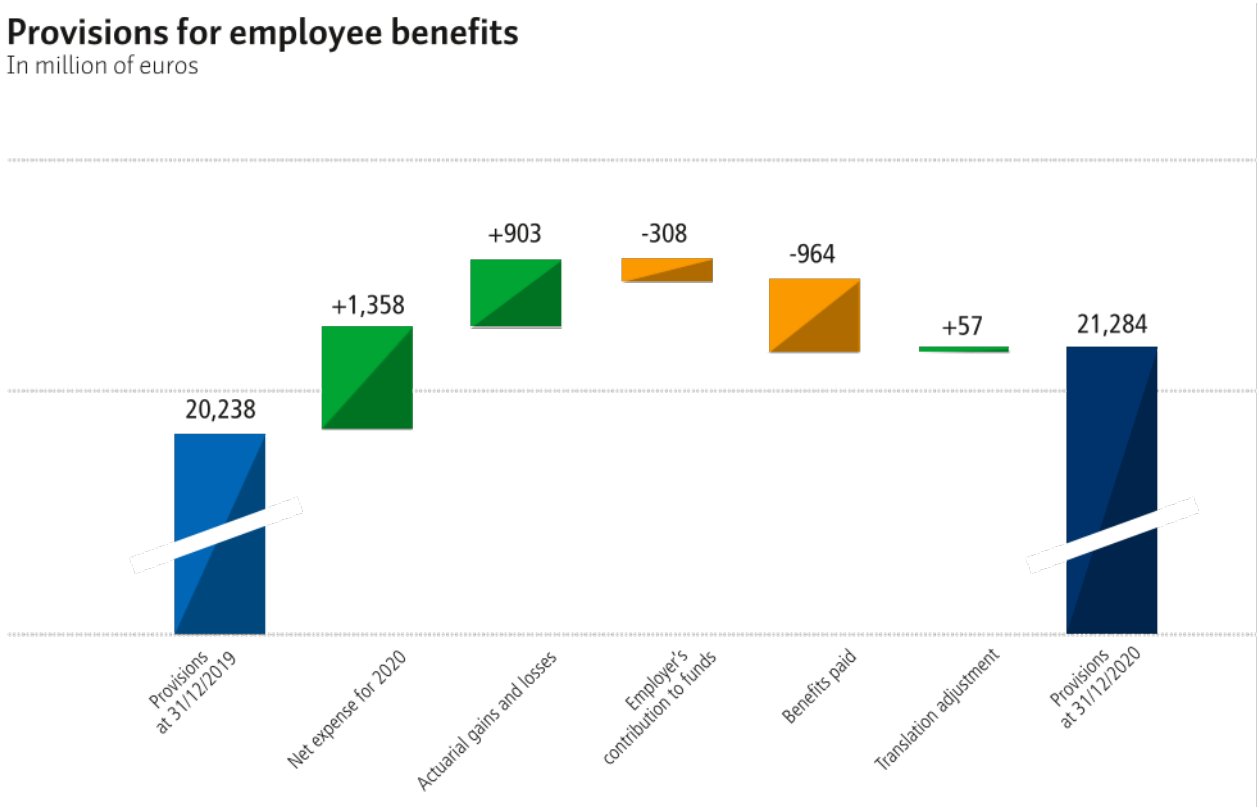
Actuarial gains and losses on fund assets amount to €(2,390) million for 2020. They mainly result from a €(1,179) million change in the United Kingdom and a €(1,204) million change in France due to a very good performance on the bond markets.

Net employee benefit liability at 31 December 2020

The net liability at 31 December 2020 amounted to €21,284 million, including:

- €22,019 million in France;
- €(1,289) million in the United Kingdom, reflecting:
- recognition by EDF Energy of surplus funding on its EEGSG and BEGG pension schemes (as explained in the accounting principles and methods below), totalling €1,725 million compared to €1,246 million at 31 December 2019. This surplus funding, which increased due to the good performance by fund assets, is recognised in balance sheet assets under "non-current financial assets";
- recognition by EDF Energy of a €436 million provision in respect of its EEPS pension scheme at 31 December 2020, compared to €224 million at 31 December 2019.

Changes in the net liability in 2020 were as follows:



16.1.2 Actuarial assumptions and sensitivity analyses

The following actuarial assumptions are used:

	France		United Kingdom	
(in %)	31/12/2020	31/12/2019	31/12/2020	31/12/2019
Discount rate/rate of return on assets [1]	0.90%	1.30%	1.45%	2.11%
Inflation rate	1.20%	1.30%	2.53%	2.89%
Wage increase rate [2]	2.30%	2.40%	2.37%	2.28%

(1) The interest income generated by assets is calculated using the discount rate. The difference between this interest income and the return on assets is recorded in equity.

(2) Average wage increase rate, including inflation and projected over a full career.

In France, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations. For longer durations, the calculation also takes into consideration data from a wider selection of corporate bonds adjusted for comparability with the high-quality bonds, given the smaller panel of bonds with these durations since 2017. The decrease in the discount rate essentially relates to the decrease in risk-free rates observed over 2020.

Changes in the economic and market parameters used have led the Group to set the discount rate at 0.90% at 31 December 2020 (1.30% at 31 December 2019).

The inflation assumption is based on an inflation curve constructed from economic forecasts and inflation-indexed market products.

As a result of changes in the economic and market parameters, the assumed average inflation rate used as the Group's benchmark for Euro zone countries is 1.2% at 31 December 2020 (1.3% at 31 December 2019).

The wage law used to calculate obligations refers to wage increases observed over the period 2015-2018 (adjusted for non-recurring effects).

The mortality table used to calculate obligations is based on the INSEE 2013-2070 generation table (produced by the French statistics office), corrected for differences in mortality between the general French population and the population covered by the IEG regime.

In the United Kingdom, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations.

Sensitivity analyses on the amount of the obligations are as follows:

	31/12/2020	
(in %)	France	United Kingdom
Impact of a 25bp increase or decrease in the discount rate	-5.0%/+5.4%	-5.4%/+6.0%
Impact of a 25bp increase or decrease in the inflation rate	+5.1%/-4.7%	+5.4%/-4.3%
Impact of a 25bp increase or decrease in the wage increase rate	+4.9%/-4.6%	+0.3%/-0.1%

16.1.3 Breakdown by geographical area of post-employment and other long-term employee benefits

	2020			
(in millions of euros)	France	United Kingdom	Other	Total
Current service cost	(663)	(262)	(28)	(953)
Past service cost	-	-	-	0
Actuarial gains and losses – other long-term benefits	(146)	-	-	(146)
Net expenses recorded as operating expenses	**(809)**	**(262)**	**(28)**	**(1,099)**
Interest expense (discount effect)	(432)	(194)	(11)	(637)
Return on fund assets	160	215	3	378
Net interest expense included in financial result	**(272)**	**21**	**(8)**	**(259)**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	**(1,081)**	**(241)**	**(36)**	**(1,358)**
Actuarial gains and losses – post-employment benefits	(2,356)	(896)	(41)	(3,293)
Actuarial gains and losses on fund assets	1,204	1,179	7	2,390
Actuarial gains and losses	**(1,152)**	**283**	**(35)**	**(903)**
Translation adjustments	**-**	**(58)**	**1**	**(57)**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	**(1,152)**	**225**	**(34)**	**(960)**

	2019			
(in millions of euros)	France	United Kingdom	Other	Total
Current service cost	(563)	(230)	(28)	(821)
Past service cost	-	-	3	3
Actuarial gains and losses – other long-term benefits	(205)	-	-	(205)
Net expenses recorded as operating expenses	**(768)**	**(230)**	**(25)**	**(1,023)**
Interest expense (discount effect)	(668)	(243)	(20)	(931)
Return on fund assets	252	263	8	523
Net interest expense included in financial result	**(416)**	**20**	**(12)**	**(408)**
EMPLOYEE BENEFIT EXPENSES RECORDED IN THE INCOME STATEMENT	**(1,184)**	**(210)**	**(37)**	**(1,431)**
Actuarial gains and losses – post-employment benefits	(4,151)	(873)	(106)	(5,130)
Actuarial gains and losses on fund assets	1,647	998	23	2,668
Actuarial gains and losses	**(2,504)**	**125**	**(83)**	**(2,462)**
Translation adjustments	**-**	**47**	**(1)**	**46**
GAINS AND LOSSES ON EMPLOYEE BENEFITS RECORDED DIRECTLY IN EQUITY	**(2,504)**	**172**	**(84)**	**(2,416)**

In 2020, actuarial gains and losses on post-employment benefits and other long-term employee benefits amount to €(3,439) million (€(146) million for long-term employee benefits and €(3,293) million for post-employment benefit obligations), including:

- €(896) million in the United Kingdom;
- €(2,502) million in France (€(146) million for long-term employee benefits and €(2,356) million for post-employment benefit obligations). These actuarial gains and losses relate to changes in the discount rate, the inflation rate and experience adjustments (see note 16.1.2).

The actuarial gains and losses on obligations generated over 2019 amount to €(4,356) million in France and are mainly associated with changes in the discount rate, the inflation rate, the proposed law on social security system funding for 2020 and the updating of the wage law.

(in millions of euros)	2020	2019
Experience adjustments	(355)	(95)
Changes in demographic assumptions	-	(1)
Changes in financial assumptions*	(2,147)	(4,260)
ACTUARIAL GAINS AND LOSSES ON OBLIGATIONS	**(2,502)**	**(4,356)**
Including:		
Actuarial gains and losses on post-employment benefits	*(2,356)*	*(4,151)*
Actuarial gains and losses on other long-term benefits	(146)	(205)

** Financial assumptions mainly concern the discount rate, inflation rate and wage increase rate.*

16.2 France (regulated activities, and generation and supply)

Given the strong similarities between their pension schemes, the two operating segments "France – Generation and Supply" and "France – Regulated activities" (see note 4.1) are combined here into a single subtotal, "France", which primarily includes EDF and Enedis. Almost all of these companies' employees have IEG status, including the special IEG pension and other IEG benefits.

16.2.1 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2020	31/12/2019
Current employees	20,477	18,994
Retirees	15,012	14,316
OBLIGATIONS	**35,489**	**33,310**

16.2.2 Provision for employee benefits by nature

At 31 December 2020

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2020	**33,893**	**(13,470)**	**20,423**
Including:			
Pensions	25,951	(12,671)	13,280
Benefits in kind (electricity/gas)	5,294	-	5,294
Retirement gratuities	941	(784)	157
Other	1,707	(15)	1,692
Provisions for other long-term employee benefits at 31/12/2020	**1,596**	**-**	**1,596**
Including:			
Annuities following work-related accident and illness, and invalidity	1,339	-	1,339
Long service awards	225	-	225
Other	32	-	32
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2020	**35,489**	**(13,470)**	**22,019**

At 31 December 2019

(in millions of euros)	Obligations	Fund assets	Provisions in the balance sheet
Provisions for post-employment benefits at 31/12/2019	**31,776**	**(12,581)**	**19,195**
Including:			
Pensions	24,463	(11,778)	12,685
Benefits in kind (electricity/gas)	4,876	-	4,876
Retirement gratuities	898	(787)	111
Other	1,539	(16)	1,523
Provisions for other long-term employee benefits at 31/12/2019	**1,534**	**-**	**1,534**
Including:			
Annuities following work-related accident and illness, and invalidity	1,290	-	1,290
Long service awards	214	-	214
Other	30	-	30
PROVISIONS FOR EMPLOYEE BENEFITS AT 31/12/2019	**33,310**	**(12,581)**	**20,729**

16.2.3 Fund assets

For France, fund assets, managed under an asset/liability model, amount to €13,470 million at 31 December 2020 (€12,581 million at 31 December 2019) and concern the coverage of retirement gratuities and the specific benefits of the special pension system.

They consist of insurance contracts with the following risk profile:

- 66% in a hedging pocket consisting of bonds, designed to replicate variations in the obligation caused by changes in interest rates;
- 34% in a growth asset pocket consisting of international equities.

Fund assets break down as follows:

(in millions of euros)	31/12/2020	31/12/2019
FUND ASSETS	**13,470**	**12,581**
Assets funding special pension benefits	**12,671**	**11,778**
Including (%)		
Listed equity instruments (shares)	34%	31%
Listed debt instruments (bonds)	66%	69%
Assets funding retirement gratuities	**784**	**787**
Including (%)		
Listed equity instruments (shares)	37%	34%
Listed debt instruments (bonds)	63%	66%
Other fund assets	**15**	**16**

At 31 December 2020, the equities held as part of fund assets are distributed as follows:

- approximately 59% of the total are shares in North American companies;
- approximately 19% of the total are shares in European companies;
- approximately 22% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

This distribution is relatively stable compared to the distribution at 31 December 2019.

At 31 December 2020, the bonds held as part of fund assets are distributed as follows:

- approximately 70% of the total are AAA and AA-rated bonds;
- approximately 30% of the total are bonds with A, BBB and other ratings.

Around 65% of bonds are sovereign bonds issued by Euro zone countries, and the balance mainly consists of bonds issued by financial and non-financial firms.

The performance of pension fund assets in France is +11% in 2020.

16.2.4 Future Cash Flows

Cash flows related to future employee benefits are as follows:

(in millions of euros)	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	1,385	1,379
One to five years	4,596	4,460
Five to ten years	5,018	4,629
More than ten years	35,949	25,021
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	**46,948**	**35,489**

At 31 December 2020, the average duration of employee benefit commitments in France is 20.6 years.

16.3 United Kingdom

The United Kingdom segment chiefly comprises EDF Energy.

16.3.1 Breakdown of obligations by type of beneficiary

(in millions of euros)	31/12/2020	31/12/2019
Current employees	5,702	5,202
Retirees	4,415	4,488
OBLIGATIONS	**10,117**	**9,690**

16.3.2 Funds assets

Pension obligations in the United Kingdom are partly covered by external funds with a present value of €11,406 million at 31 December 2020 (€10,712 million at 31 December 2019).

The investment strategy applied in these funds is a liability driven investment strategy. The allocation between growth and back-to-back is regularly reviewed by the trustees, at least after every actuarial valuation, to ensure that the funds' overall investment strategy remains coherent in order to achieve the target coverage level required.

These assets break down as follows:

(in millions of euros)	31/12/2020	31/12/2019
BEGG pension fund	8,585	8,144
EEGSG pension fund	1,585	1,493
EEPS pension fund	1,236	1,075
FUND ASSETS	**11,406**	**10,712**
Including (%)		
Listed equity instruments (shares)	11%	11%
Listed debt instruments (bonds)	61%	57%
Real estate properties	6%	7%
Cash and cash equivalents	4%	2%
Other	18%	23%

At 31 December 2020, the equities held as part of fund assets are distributed as follows:

- approximately 60% of the total are shares in North American companies;
- approximately 23% of the total are shares in European companies;
- approximately 17% of the total are shares in companies in the Asia-Pacific zone and emerging countries.

At 31 December 2020, the bonds held as part of fund assets are distributed as follows:

- approximately 70% of the total are AAA and AA-rated bonds;
- approximately 30% of the total are bonds with A, BBB and other ratings.

Around 71% of all these bonds are sovereign bonds, mainly issued by the United Kingdom. The balance mainly consists of bonds issued by financial and non-financial firms.

The portion of sovereign bonds issued by the United Kingdom was 1 percentage point higher than at 31 December 2019.

16.3.3 Future cash flows

Cash flows related to future employee benefits are as follows:

(in millions of euros)	Cash flow under year-end economic conditions	Amount covered by provisions (present value)
Less than one year	409	440
One to five years	1,742	1,690
Five to ten years	2,419	2,130
More than ten years	9,640	5,857
CASH FLOWS RELATED TO EMPLOYEE BENEFITS	**14,210**	**10,117**

The contribution to funds for 2021 is estimated at approximately €298 million (€288 million contributed by the employer and €10 million by the employees).

The average weighted duration of funds in the United Kingdom is 23.5 years at 31 December 2020.

Note 17 Other provisions and contingent liabilities

(in millions of euros)	Notes	31/12/2020 Current	31/12/2020 Non-current	31/12/2020 Total	31/12/2019 Current	31/12/2019 Non-current	31/12/2019 Total
Other provisions for decommissioning	17.1	120	1,744	**1,864**	105	1,573	**1,678**
Other provisions	17.2	2,675	3,630	**6,305**	2,710	3,065	**5,775**
OTHER PROVISIONS		**2,795**	**5,374**	**8,169**	**2,815**	**4,638**	**7,453**

17.1 Other provisions for decommissioning

The breakdown by company is as follows:

(in millions of euros)	EDF	EDF Energy	Edison	Framatome	Other	Total
OTHER PROVISIONS FOR DECOMMISSIONING AT 31/12/2020	**772**	**128**	**172**	**412**	**380**	**1,864**
Other provisions for decommissioning at 31/12/2019	**667**	**143**	**161**	**388**	**319**	**1,678**

Other provisions for decommissioning principally concern fossil-fired power plants, installations for the production of nuclear fuel assemblies, and dismantling of wind farms.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation. The provision recorded at 31 December 2020 reflects the most recent known cost estimates and includes rehabilitation costs for generation sites.

Provisions for decommissioning notably include €140 million for Basic nuclear facilities (INB) in France, in the amounts of €78 million for Framatome and €62 million for Cyclife France. Dedicated assets have been set aside to cover these provisions as required by the regulations.

Dedicated assets of Framatome and Cyclife France

The dedicated assets of Framatome and Cyclife France (formerly SOCODEI) relating to Basic nuclear facilities (INB) in France have realisable values of €97 million in Framatome and €57 million in Cyclife France and the degree of coverage of provisions according to the regulations is 124% for Framatome and 91% for Cyclife France, mainly due to the decrease in the real discount rate at 31 December 2020.

17.2 Other provisions

Details of changes in other provisions are as follows:

(in millions of euros)	31/12/2019	Increases	Decreases: Utilisations	Decreases: Reversals	Changes in scope	Other changes*	31/12/2020
Provisions for contingencies related to subsidiaries and investments	766	8	(28)	(8)	(1)	64	801
Provisions for tax liabilities (excluding income tax)	155	26	(13)	(2)	-	-	166
Provisions for litigation	479	68	(56)	(101)	-	2	392
Provisions for onerous contracts and losses on completion	1,356	527	(261)	(14)	(6)	288	1,890
Provisions related to environmental schemes	1,517	1,535	(1,807)	-	-	(53)	1,192
Other provisions for risks and liabilities	1,502	752	(356)	(46)	1	11	1,864
TOTAL	**5,775**	**2,916**	**(2,521)**	**(171)**	**(6)**	**312**	**6,305**

** Other changes principally concern the effects of the change in real discount rate at 31 December 2020 (see note 8.2).*

Provision for onerous contracts

Provisions for onerous contracts primarily relate to multi-year agreements for the purchase or sale of energy and services:

- losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price;
- losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied;
- losses on gas-related service agreements are measured by comparing the costs of fulfilling a contract with the resulting economic benefits, based on market and sales assumptions.

Provisions for onerous contracts are mainly attributable to the Group's LNG activities (long-term LNG purchase contracts and a long-term regasification contract with Dunkerque LNG).

The revenues and margin on Framatome's long-term contracts are recorded under the percentage-of-completion method. When the estimated result upon completion is negative, the loss is immediately recorded in profit and loss, after deducting the loss already recognised under the percentage-of-completion method, and a provision is booked.

Provisions related to environmental schemes

Provisions related to environmental schemes include provisions to cover shortfalls in greenhouse gas emission rights, renewable energy certificates and energy savings certificates, based on the assigned obligations (see notes 5.4.3, 10.2, 20.1 and 20.2.1).

Through the **renewable energy certificates scheme**, the EDF group has an obligation to surrender renewable energy certificates, particularly in the United Kingdom and Belgium.

At 31 December 2020, a provision of €932 million was booked in connection with the obligation to surrender renewable energy certificates at that date, essentially concerning EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations is covered by purchases of certificates included in intangible assets.

One of the main features of the third phase of the European Union **greenhouse gas emission quota system**, running from 2013 to 2020, is the discontinuation of free allocation of emission rights to electricity producers in certain countries, including France and United Kingdom.

In the EDF group, the entities concerned by this system are EDF, EDF Energy, Edison, Dalkia, PEI and Luminus.

In 2020, the Group surrendered, according the best estimate 21 million tonnes in respect of emissions generated in 2019. In 2019, the Group surrendered 26 million tonnes in respect of emissions generated in 2018.

The Group's total emission rights allocation for 2020 recorded in the national registers is 0 million tonnes (1 million tonnes for 2019).

The volume of emissions at 31 December 2020 stood at 19 million tonnes (21 million tonnes for 2019).

At 31 December 2020, a provision of €260 million was recognised for over-quota greenhouse gas emissions by the Group (€414 million at 31 December 2019).

Other provisions for risks and liabilities

These provisions cover various contingencies and expenses related to operations (employers' matching contributions to employee profit sharing, restructuring operations, contractual maintenance obligations, etc.). No individual provision is significant.

In extremely rare cases, description of a specific litigation covered by a provision may be omitted from the notes to the financial statements if such disclosure could cause serious prejudice to the Group.

17.3 Contingent liabilities

Accounting principles and methods

A contingent liability is:

- a potential obligation arising from past events, which will only be confirmed by the occurrence (or non-occurrence) of one or more uncertain future events that are not completely within the entity's control, or
- a present obligation arising from past events that is not recognised in the financial statements because an outflow of resources representing economic benefits is unlikely to be necessary to extinguish the obligation, or because the amount of the obligation cannot be measured reliably.

The principal contingent liabilities at 31 December 2020 are the following:

17.3.1 Tax inspections

EDF

For the period 2008 to 2017, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. As stated in the 2019 financial statements, this recurrent reassessment, which is applied for each year, represented a cumulative financial risk of some €556 million in income taxes at 31 December 2019. In two rulings made in 2017 and one in 2019, Montreuil Administrative Court recognised the tax-deductibility of these liabilities and validated the position taken by the Company. The Minister appealed against two of these rulings. In January 2020, the Versailles Administrative Court upheld EDF's position for the year 2008, but the Minister appealed. In a decision of 11 December 2020 the Council of State overturned the Versailles court's decision and sent the case back before the same court (see note 15.1.1.4). In application of IFRIC 23, EDF has recognised a net tax liability of €510 million in its 2020 financial statements.

For the years 2012 to 2017, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *cotisation sur la valeur ajoutée des entreprises* (tax on corporate value added) and questioned the deductibility of long-term provisions.

EDF International

Following the tax inspections of EDF International for the years 2009 to 2014, the French tax authorities questioned the valuation of the bond convertible into shares issued to refinance the acquisition of British Energy. The total amount concerned was approximately €310 million. EDF International contested this reassessment.

In judgements of 2 July 2019 for the period 2009-2013 and 30 January 2020 for the year 2014, Montreuil Administrative Court confirmed the tax reassessments. EDF International has therefore paid the tax in execution of these decisions, which it has also appealed.

17.3.2 Labour litigation

EDF and its subsidiaries are party to a number of labour lawsuits. The Group considers that none of these lawsuits, individually, is likely to have a significant impact on its financial results or financial position. However, because they relate to situations that could concern a large number of EDF's employees in France, any increase in such litigations could have a potentially negative impact on the Group's financial position.

17.3.3 Litigation with photovoltaic producers

Announcements in 2010 of a cut in electricity purchase tariffs triggered an upsurge, particularly in August 2010, in connection applications submitted to distribution network operators in mainland France and in zones not interconnected to the mainland national grid (since the applicable tariff depended on the date at which a complete connection application was filed). By a decree of 9 December 2010 (the "moratorium decree") the Government suspended the conclusion of new contracts with purchase obligations for a three-month period, and stated that any applications not approved by 2 December 2010 would have to be resubmitted at the end of this three-month period, based on a new decision fixing the purchase price for photovoltaic electricity. That tariff decision was issued on 4 March 2011, and significantly reduced the electricity purchase prices. A tender system was developed in parallel.

A ruling given by the French Council of State on 16 November 2011 rejecting appeals against the moratorium decree generated a large volume of legal proceedings against Enedis and EDF in late 2011 which continued through 2012, 2013, 2014 and 2015. Since March 2016, new actions for compensation relating to the photovoltaic moratorium are definitively barred.

Most of these legal proceedings were initiated by electricity producers who argued that they were forced to abandon their projects because the new electricity purchase tariffs made operating conditions less favourable. These producers consider the network operators responsible for this situation, on the grounds that they did not issue the technical and financial connection proposals in time for them to benefit from more advantageous electricity purchase terms.

The first instance and appeal court rulings given varied in their reasoning and verdicts: some rejected all claims while others awarded indemnities, which were generally smaller than the amounts initially claimed.

In December 2015 Versailles Appeal Court decided to apply to the Court of Justice of the European Union (CJEU) for a preliminary ruling on the point of whether the tariff decisions of 2006 and 2010 complied with European law on State aid.

This application was considered irreceivable for procedural reasons. On 20 September 2016, Versailles Appeal Court made another application to the CJEU for a preliminary ruling on the same point, and decided to suspend its own ruling. In an order of 15 March 2017, the CJEU confirmed that the decisions of 10 July 2006 and 12 January 2010 setting the purchase tariffs for photovoltaic electricity constituted "intervention by the State or using State resources", one of the four criteria that characterise State aid. The Court stated that such a support measure, implemented without prior notification to the Commission, is illegal, and concluded that it was now up to the national courts to act accordingly, particularly by banning application of these illegal decisions.

Several courts found in favour of Enedis during 2018. Notably, in early July 2018 Versailles Appeal Court dismissed 150 producers' claims, because there was no evidence establishing misconduct by Enedis, or because there was no causal link between Enedis' misconduct and the prejudice, or because the prejudice was not deemed eligible for compensation since the tariff decisions of 2006 and 2010 are illegal, as the European Commission did not receive the prior notification required by State aid control rules. Appeals were filed before the Court of Cassation against most of these decisions. On 18 September 2019, the French Court of Cassation issued several decisions rejecting claims concerning both Enedis and EDF, judging the aid illegal because the tariff decisions were not notified to the European Commission as required by Article 108 of the TFEU. Consequently, the Court of Cassation concluded that the prejudice of producers who could not benefit from that aid is deemed not legally reparable. Court of Cassation decisions have essentially confirmed its ruling of 18 September 2019 and rejected producers' appeals founded on state aid arguments.

In parallel to the compensation claims before civil courts, EDF and Enedis sought to apply their Civil Liability insurance policy, but the insurers refused their claim. The French Court of Cassation considered in a ruling of 9 June 2015 (for the Green Yellow case) that the insurance payment was due and that the distribution network operator was at fault. Following that ruling, Enedis and EDF brought action against their insurers in April 2017, applying to the courts for formal recognition of two partial serial claims. If the courts were to recognise the existence of two partial serial claims, a single excess and a single limit would apply for all claims with the same technical cause.

17.3.4 Edison – Sale of Ausimont (site de Bussi)

Several legal actions before the civil, administrative and criminal courts were begun following the sale by Edison of the Ausimont SpA industrial complex to Solvay Solexis SpA in 2002. The following proceedings are still ongoing:

- two administrative cases:
  - on 28 February 2018, the Province of Pescara notified Solvay Speciality Polymers Italy SpA (formerly Solvay Solexis SpA) and Edison SpA of the launch of an administrative procedure to determine who was responsible for the pollution of the land outside the industrial complex belonging to Ausimont SpA which had been sold. The Province also ordered it to remove waste that was on the land concerned. Edison first appealed against this order before Pescara regional administrative court, and then before the Italian Council of State. In April 2020 the Council of State rejected the claim and Edison, considering the ruling unfair and unlawful, filed an application for its annulment before the Court of Cassation and the Council of State. The proceedings are ongoing. Meanwhile Edison has begun work to make the site safe in agreement with the competent Public Administrations,
  - in an announcement of 18 December 2019, the Province of Pescara ordered Edison SpA to clean up the land located inside the industrial complex. Edison has challenged this order before Pescara regional administrative court and the proceedings are ongoing;
- one arbitration case: in 2012, arbitration proceedings were launched by Solvay SA and Solvay Specialty Polymers Italy SpA (the purchaser of Ausimont) for violation by Edison of the representations and warranties in environmental matters concerning the Bussi and Spinetta Marengo sites contained in the sale agreement. These proceedings are ongoing, and Edison expects a decision within the first half of 2021;
- one civil case: on 8 April 2019, the Italian Ministry for the Environment brought a civil action against Edison, claiming damages for environmental disaster. These proceedings are ongoing.

17.3.5 Edison – Mantua – Environmental procedure

In recent years the Italian province of Mantua notified Edison of eight orders to rehabilitate land and the whole Mantua petrochemical site sold by Montedison to the ENI group in 1990, despite two settlement agreements concerning these environmental matters signed by Montedison and Edison with ENI and the Italian Ministry for the Environment.

Edison appealed against all these orders before the Brescia Division of the Lombardy regional administrative court, but lost its appeal in August 2018. Edison then took the matter to the Italian Council of State.

The Council of State rejected Edison's appeal in a ruling of 1 April 2020 and the first-instance decisions were therefore upheld.

Edison pursued its appeal before the Court of Cassation and the Council of State itself.

However, Edison has already begun remedial work on site, taking over from the previous operators by proceeding to a series of tenders.

17.3.6 Enedis – Quadlogic

On 24 February 2016, Enedis received a summons for proceedings brought before the Paris Regional Court by an American company, Quadlogic Controls Corporation (QCC), for alleged infringement of a European patent held by QCC. Enedis strongly contested both QCC's inventive input and the alleged infringement.

In November 2017, the Paris Regional Court ruled in favour of Enedis and cancelled QCC's European patent in France. QCC filed an appeal against this ruling on 12 March 2018.

In November 2020 the parties reached an amicable settlement that ended this litigation.

Note 18 Financial assets and liabilities

Accounting principles and methods

Financial assets comprise equity instruments (particularly non-consolidated investments), debt securities, loans and receivables at amortised cost, derivative assets (see note 18.7) and cash and cash equivalents (see note 18.2).

The classification and measurement of financial instruments depend on the business model and the instruments' contractual characteristics. They are carried at amortised cost, fair value through other comprehensive income (OCI), or fair value through profit and loss.

Financial liabilities comprise loans and other financial liabilities, bank credit and derivative liabilities (see note 18.7).

Financial assets and liabilities are recorded in the balance sheet as current if they mature within one year and non-current if they mature after one year, apart from derivatives held for trading, which are all classified as current.

Derecognition of financial assets and liabilities

The Group derecognises a financial asset when:

- the contractual rights to the cash flows generated by the asset expire; or
- the Group transfers the rights to receive contractual cash flows related to the financial asset through the transfer of substantially all of the risks and rewards associated with ownership of the asset.

Any interest created or retained by the Group in transferred financial assets is recorded as a separate asset or liability.

The Group derecognises a financial liability when its contractual obligations are extinguished, cancelled or expire. When a debt is renegotiated with a lender the Group derecognises the debt and recognises a new liability when the new terms are substantially different; otherwise, the book value is recalculated. In either case, the impacts of the debt renegotiation are recorded in profit and loss.

18.1 Financial assets

Accounting principles and methods

Financial assets comprise debt and equity securities. The accounting treatment applied depends on their contractual characteristics and business model.

Financial assets carried at fair value through OCI with or without recycling

Financial assets carried at fair value through OCI comprise:

- non-consolidated investments for which the Group has irrevocably opted to recognise subsequent fair value changes in OCI, with no recycling to profit and loss in the event of sale. Only dividends received from these investments are recognised in the income statement, under "Other financial income";
- debt securities (such as bonds) invested under a mixed "collect and sell" business model for which contractual cash flows consist entirely of principal and interest payments reflecting the time value of money and the credit risk associated with the instrument (the IFRS 9 "SPPI" test – Solely Payment of Principal and Interest). Changes in fair value are recorded directly in OCI with recycling and transferred to profit and loss when the securities are sold. For these debt securities, interest income is calculated at the effective interest rate and credited to the income statement under the heading "Other financial income".

Upon **initial recognition**, these financial assets are recorded at fair value plus transaction costs attributable to their acquisition.

At each reporting date, they are adjusted to fair value based on quoted prices where possible, or using the discounted future cash flow method or by reference to external sources otherwise. Changes in the fair value of these instruments are recorded directly in OCI with recycling (for debt securities) or OCI with no recycling (for equity instruments) in the income statement.

Financial assets carried at fair value through profit and loss

Financial assets carried at fair value through profit and loss comprise:

- assets acquired from inception with the intention of resale in the short term;
- derivatives not classified as hedges (derivatives held for trading) (see note 18.7);
- equity instruments (non-consolidated investments) which the Group has not irrevocably opted to classify as at fair value through OCI with no recycling;
- debt securities that do not meet the requirements of the SPPI test, regardless of their business model. This chiefly concerns shares in investment funds.

These assets are recorded **at the transaction date** at fair value, which is generally equal to the amount of cash paid out. Transaction costs directly attributable to the acquisition are recorded in the income statement.

At each reporting date, they are adjusted to fair value based on quoted prices where possible, or using recognised valuation techniques such as the discounted cash flow method or reference to external sources otherwise. Changes in the fair value of these instruments are recorded in the income statement under the heading "Other financial income and expenses".

Financial assets carried at amortised cost

Loans and financial receivables are carried at amortised cost if the business model involves holding the instrument in order to collect contractual cash flows which consist entirely of principal and interest.

The interest received is calculated under the effective interest rate method and recorded in "Other financial income" in the income statement.

Loans and financial receivables that are not eligible for classification at amortised cost are carried at fair value through profit and loss, and recorded in "Other financial income and expenses" in the income statement.

Impairment model

The impairment model is based on expected credit loss (ECL). The Group applies a rating-based approach for counterparties with low credit risk. In application of the risk management policy, the Group's bond portfolio consists almost entirely of instruments issued by low-risk counterparties rated "Investment Grade".

In this situation, the ECL is estimated over a 12-month horizon following the year-end.

The threshold indicating a significant increase in credit risk is reached when the counterparty ceases to be rated "Investment Grade". The significant increase in the default risk may lead to reassessment of the ECL over the instrument's residual life.

For loans and receivables, the Group has chosen an approach based on the probability of default by the counterparty and assessment of changes in the credit risk.

18.1.1 Breakdown between current and non-current financial assets

Current and non-current financial assets break down as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Current	Non-current	Total	Current	Non-current	Total
Instruments at fair value through OCI with recycling	13,044	5,696	18,740	17,711	6,208	23,919
Instruments at fair value through OCI with no recycling	34	228	262	5	447	452
Instruments at fair value through profit and loss	2,556	22,807	25,363	1,593	20,193	21,786
Debt and equity securities	**15,634**	**28,731**	**44,365**	**19,309**	**26,848**	**46,157**
Trading derivatives – Positive fair value	5,038	-	5,038	6,813	-	6,813
Hedging derivatives – Positive fair value	1,625	3,814	5,439	1,803	3,956	5,759
Loans and financial receivables*	1,235	15,070	16,305	1,476	15,415	16,891
CURRENT AND NON-CURRENT FINANCIAL ASSETS	**23,532**	**47,615**	**71,147**	**29,401**	**46,219**	**75,620**

** Including impairment of €(432) million at 31 December 2020 (€(352) million at 31 December 2019).*

18.1.2 Debt and equity securities

Details of debt and equity securities

Financial assets are monitored and managed by the Group with two main objectives:

- **dedicated assets set aside in France for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste, as required by Article L. 594 of France's Environment Code.** These assets consist of diversified investments in bonds, monetary and equity investment funds, and equity investments held by EDF Invest. The general management policy for dedicated assets and a breakdown of the portfolio is presented in note 15.1.2;
- **assets managed according to a liquidity-oriented policy** ("liquid assets"). These are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash. EDF's monetary investment funds included in liquid assets amount to €2,441 million at 31 December 2020 (€409 million at 31 December 2019).

Details of debt and equity securities are shown in the table below:

	31/12/2020				31/12/2019
(in millions of euros)	At fair value through OCI with recycling	At fair value through OCI with no recycling	At fair value through profit and loss	Total	Total
Debt and equity securities					
EDF dedicated assets	6,172	-	22,226	28,398	26,018
Liquid assets	12,509	-	2,519	15,028	18,900
Other assets*	59	262	618	939	1,240
TOTAL	**18,740**	**262**	**25,363**	**44,365**	**46,157**

** Investments in non-consolidated companies.*

Changes in debt and equity securities

(in millions of euros)	31/12/2019	Net increases	Changes in fair value	Changes in scope	Translation adjustments	Other	31/12/2020
Instruments at fair value through OCI with recycling	23,919	(5,091)	143	-	(243)	12	18,740
Instruments at fair value through OCI with no recycling	452	1	(39)	(179)	-	27	262
Instruments at fair value through profit and loss	21,786	2,614	819	121	(8)	31	25,363
TOTAL DEBT AND EQUITY SECURITIES	**46,157**	**(2,476)**	**923**	**(58)**	**(251)**	**70**	**44,365**

Changes in fair value recorded in equity

Changes in the fair value of debt and equity securities were recorded in equity (EDF share) over the period as follows:

	2020			2019		
(in millions of euros)	Gross changes in fair value recorded in OCI with recycling [1]	Gross changes in fair value recorded in OCI with no recycling [1]	Gross changes in fair value recycled to profit and loss [2]	Gross changes in fair value recorded in OCI with recycling [1]	Gross changes in fair value recorded in OCI with no recycling [1]	Gross changes in fair value recycled to profit and loss [2]
EDF dedicated assets	224	-	162	297	-	136
Liquid assets	(29)	-	13	139	-	7
Other assets	-	(34)	-	-	(22)	-
DEBT AND EQUITY SECURITIES [3]	**195**	**(34)**	**175**	**436**	**(22)**	**143**

(1) +/(): increase/(decrease) in equity (EDF share).
(2) +/(): increase/(decrease) in income (EDF share).
(3) Excluding associates and joint ventures.

In 2020, gross changes in fair value recorded in OCI with recycling principally concern EDF (€20 million, including €62 million for dedicated assets). In 2019, gross changes in fair value recorded in OCI with recycling principally concern EDF (€293 million, including €161 million for dedicated assets).

No significant impairment was recorded in 2020.

18.1.3 Loans and financial receivables

Loans and financial receivables consist of the following:

(in millions of euros)	31/12/2020	31/12/2019
Amounts receivable from the NLF	13,034	13,303
CSPE	-	684
Loans and financial receivables – other	3,271	2,904
LOANS AND FINANCIAL RECEIVABLES	**16,305**	**16,891**

At 31 December 2020 loans and financial receivables mainly include:

- amounts representing reimbursements receivable from the NLF and the British government for coverage of long-term nuclear obligations, totalling €13,034 million at 31 December 2020 (€13,303 million at 31 December 2019), discounted at the same rate as the provisions they finance (see note 15.2);
- the receivable corresponding to the accumulated shortfall in the Contribution to the Public Electricity Service (CSPE) at 31 December 2017 and the costs of bearing that shortfall. In 2020, reimbursements of principal and interest amounted to €660 million and €30 million, in line with the schedule published in the ministerial orders of 13 May 2016 and 2 December 2016, made in application of Article R. 121-31 of the French Energy Code. At 31 December 2020, EDF's financial receivable was fully repaid by the State (see note 5.4.1). This CSPE receivable was allocated in its entirety to dedicated assets;
- other loans and financial receivables notably include:
  - the overfunding of EDF Energy's EEGSG and BEGG pension schemes by €1,725 million, compared to €1,246 million at 31 December 2019 (see note 16.1.1),
  - an amount of €263 million representing the advance payments made by Luminus to Synatom to cover long-term nuclear obligations (€230 million at 31 December 2019). In Luminus' financial statements these amounts are discounted at the same rate as the provisions they fund (see note 15.3). This receivable is equal to the fair value of the amounts held by Synatom on behalf of Luminus as fund assets;
- loans made by EDF Renewables in the course of its project development activity, mainly in connection with wind farms in France and North America, amounting to €382 million at 31 December 2020 compared to €559 million at 31 December 2019.

Changes in loans and financial receivables

(in millions of euros)	31/12/2019	Net increases	Discount effect	Changes in scope	Translation adjustments	Other	31/12/2020
Loans and financial receivables	**16,891**	**(913)**	**262**	**(61)**	**(827)**	**953**	**16,305**

The net decrease in loans and financial receivables includes the €(684) million change in the CSPE receivable.

Other changes in loans and financial receivables principally correspond to the changes in the receivable representing amounts reimbursable by the Nuclear Liabilities Fund (NLF) and the British government, and the surplus funding of EDF Energy's EEGSG and BEGG pension schemes.

18.2 Cash and cash equivalents

Accounting principles and methods

Cash and cash equivalents comprise immediately available liquidities and very short-term investments that are readily convertible (*e.g.* in monetary funds) into a known amount of cash, usually maturing within three months or less of the acquisition date, and with negligible risk of fluctuation in value. These items are held to cover short-term obligations rather than for short-term investments or other purposes. When they mature in more than 3 months, they are included in Liquid assets in Debt and equity securities (see note 18.1.2).

"Cash equivalents" are recorded at fair value, with changes in fair value included in the heading "Other financial income and expenses".

Cash and cash equivalents include the following amounts recorded in the balance sheet:

(in millions of euros)	31/12/2020	31/12/2019
Cash	5,832	3,698
Cash equivalents	438	236
CASH AND CASH EQUIVALENTS	**6,270**	**3,934**

Cash restrictions

Cash and cash equivalents include €242 million of cash subject to restrictions at 31 December 2020 (€213 million at 31 December 2019) (see note 1.3.5).

18.3 Financial liabilities

Accounting principles and methods

Loans and other financial liabilities are carried at amortised cost, adjusted for changes in the value of the risks hedged when they are covered by a fair value hedge (see note 18.7). Interest expenses are calculated at the effective interest rate and recorded in the income statement in "Cost of gross financial indebtedness" over the duration of the loan or financial liability.

18.3.1 Breakdown between current and non-current financial liabilities

Current and non-current financial liabilities break down as follows:

	31/12/2020			31/12/2019		
(in millions of euros)	Non-current	Current	Total	Non-current	Current	Total
Loans and other financial liabilities	54,066	11,525	65,591	56,306	11,074	67,380
Trading derivatives – negative fair value*	-	5,125	5,125	-	6,327	6,327
Hedging derivatives – negative fair value*	1,833	959	2,792	696	1,134	1,830
FINANCIAL LIABILITIES	**55,899**	**17,609**	**73,508**	**57,002**	**18,535**	**75,537**

* *See note 18.7.*

18.3.2 Loans and other financial liabilities

18.3.2.1 Changes in loans and other financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued Interest	Total
Balances at 31/12/2019	**52,448**	**3,139**	**5,952**	**4,510**	**1,331**	**67,380**
Increases	2,531	835	3,235	479	129	7,209
Decreases	(3,769)	(371)	(2,293)	(719)	(215)	(7,367)
Translation adjustments	(440)	(119)	(210)	(44)	(6)	(819)
Changes in scope of consolidation	(18)	(206)	(19)	(20)	(2)	(265)
Changes in fair value	(554)	3	(81)	-	-	(632)
Other changes	(2)	16	(13)	101	(17)	85
BALANCES AT 31/12/2020	**50,196**	**3,297**	**6,571**	**4,307**	**1,220**	**65,591**

The main **bond**-related operation of 2020 was the offering of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). The debt component of these bonds is presented in bonds at the net-of-expense amount of €2,389 million (see notes 14.4.1 and 18.3.2.2).

At 31 December 2020, EDF's **other financial liabilities** include negotiable debt instruments amounting to €2,288 million, and an amount of €821 million recognised in respect of the cash received for debt securities transferred to banks under repurchase agreements. These operations do not affect the net indebtedness.

A breakdown of the issuance and repayments of borrowings as presented **in the cash flow statement** is presented below:

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Termination of hedging derivatives	31/12/2020
Issuance of borrowings	2,531	835	3,235	-	-	6,601
Repayments of borrowings	(3,769)	(371)	(2,293)	(719)	90	(7,062)

18.3.2.2 Principal borrowings of the Group

The Group's principal borrowings (excluding Green Bonds and OCEANEs) at 31 December 2020 are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue*	Maturity	Issue amount	Currency	Rate
Euro MTN	EDF	01/2009	01/2021	2,000	EUR	6.25%
Euro MTN	EDF	01/2012	01/2022	2,000	EUR	3.88%
Euro MTN	EDF	09/2012	03/2023	2,000	EUR	2.75%
Euro MTN	EDF	09/2009	09/2024	2,500	EUR	4.63%
Euro MTN	EDF	11/2010	11/2025	750	EUR	4.00%
Bond	EDF	01/2017	01/2027	107,900	JPY	1.09%
Euro MTN	EDF	03/2012	03/2027	1,000	EUR	4.13%
Bond	EDF	09/2018	09/2028	1,800	USD	4.50%
Euro MTN	EDF	04/2010	04/2030	1,500	EUR	4.63%
Euro MTN	EDF	10/2018	10/2030	1,000	EUR	2.00%
Euro MTN	EDF	07/2001	07/2031	650	GBP	5.88%
Euro MTN	EDF	02/2003	02/2033	850	EUR	5.63%
Euro MTN	EDF	06/2009	06/2034	1,500	GBP	6.13%
Euro MTN	EDF	10/2016	10/2036	750	EUR	1.88%
Bond	EDF	09/2018	09/2038	650	USD	4.88%
Bond	EDF	01/2009	01/2039	1,750	USD	6.95%
Euro MTN	EDF	11/2010	11/2040	750	EUR	4.50%
Euro MTN	EDF	10/2011	10/2041	1,250	GBP	5.50%
Bond	EDF	01/2014	01/2044	1,000	USD	4.88%
Bond	EDF	10/2015	10/2045	1,500	USD	4.75%
Bond	EDF	10/2015	10/2045	1,150	USD	4.95%
Bond	EDF	09/2018	09/2048	1,300	USD	5.00%
Euro MTN	EDF	12/2019	12/2049	1,250	EUR	2.00%
Euro MTN	EDF	09/2010	09/2050	1,000	GBP	5.13%
Euro MTN	EDF	10/2016	10/2056	2,164	USD	4.99%
Euro MTN	EDF	11/2019	12/2069	2,000	USD	4.50%
Bond	EDF	01/2014	01/2114	1,350	GBP	6.00%

** Date funds were received.*

At 31 December 2020, the Group's principal Green Bonds (see note 20.3.1) are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue	Maturity	Issue amount	Currency	Rate
Euro MTN (Green Bond)	EDF	11/2013	04/2021	1,400	EUR	2.25%
Bond (Green Bond)	EDF	10/2015	10/2025	1,250	USD	3.63%
Euro MTN (Green Bond)	EDF	10/2016	10/2026	1,750	EUR	1.00%

On 8 September 2020, EDF made an offering of Green Bonds convertible into new shares and/or exchangeable for existing shares (*OCEANEs Vertes*). The key features of this issue are as follows:

Type of borrowing *(in millions of currencies)*	Entity	Issue	Maturity	Issue amount	Currency	Rate
OCEANEs Vertes Green Bonds	EDF	09/2020	09/2024	2,400	EUR	0%

The issue price for these bonds was €11.70, *i.e.* 107.00% of their nominal value or a gross annual return of -1.68%. The nominal value of the bonds was set at €10.93 including a conversion premium of 32.5% over the Company's reference price on Euronext Paris, the regulated Paris stock market [(1)].

Holders of these bonds have the right to convert them into new EDF shares and/or exchange them for existing EDF shares.

The conversion and/or exchange rate is set at one share per bond, subject to the standard adjustments including anti-dilution and dividend protections as described in the terms of the issue.

The bonds may be redeemed prior to maturity at the option of the Company, subject to certain conditions.

Unless previously converted, exchanged, redeemed or repurchased and cancelled, the bonds will be redeemed at nominal value when they reach maturity.

These bonds are listed on the Euronext Access™ market operated by Euronext in Paris.

18.3.3 Loans and financial liabilities by maturity, currency and interest rate

18.3.3.1 Maturity of loans and financial liabilities

(in millions of euros)	Bonds	Loans from financial institutions	Other financial liabilities	Lease liability	Accrued Interest	Total
Less than one year	3,447	575	5,951	673	879	11,525
From one to five years	12,078	1,478	106	2,034	136	15,832
More than five years	34,671	1,244	514	1,600	205	38,234
LOANS AND OTHER FINANCIAL LIABILITIES AT 31/12/2020	**50,196**	**3,297**	**6,571**	**4,307**	**1,220**	**65,591**

The non-discounted lease liability matures as follows:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1-5 years	> 5 years	Total
NON-DISCOUNTED CONTRACTUAL CASH FLOWS	**4,883**	**757**	**2,183**	**1,943**	**5,052**

18.3.3.2 Breakdown of loans and other financial liabilities by currency

The breakdown of loans and other financial liabilities by currency includes the effect of derivatives classified as hedges (of debts in foreign currencies and net investments in foreign subsidiaries) under IFRS 9.

At 31 December 2020

	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Euro (EUR)	36,241	55%	11,798	48,039	73%
American dollar (USD)	16,735	26%	(10,958)	5,777	9%
Pound sterling (GBP)	9,996	15%	537	10,533	16%
Other	2,619	4%	(1,377)	1,242	2%
LOANS AND OTHER FINANCIAL LIABILITIES	**65,591**	**100%**	**-**	**65,591**	**100%**

(1) The reference price is equal to the volume-weighted average EDF share price observed on Euronext Paris between the launch date of the green bond offering until the final pricing of the bonds was determined the same day, i.e. €8.2465.

At 31 December 2019

	31/12/2019				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Euro (EUR)	33,360	50%	18,491	51,851	77%
American dollar (USD)	20,867	31%	(14,814)	6,053	9%
Pound sterling (GBP)	10,269	15%	(1,705)	8,564	13%
Other	2,884	4%	(1,972)	912	1%
LOANS AND OTHER FINANCIAL LIABILITIES	**67,380**	**100%**	**-**	**67,380**	**100%**

18.3.3.3 Breakdown of loans and other financial liabilities by type of interest rate

The breakdown of loans and other financial liabilities by type of interest rate includes the effect of derivatives classified as hedges under IFRS 9.

At 31 December 2020

	31/12/2020				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Fixed rates	60,667	92%	(15,217)	45,450	69%
Floating rates	4,924	8%	15,217	20,141	31%
LOANS AND OTHER FINANCIAL LIABILITIES	**65,591**	**100%**	**-**	**65,591**	**100%**

At 31 December 2019

	31/12/2019				
	Initial debt structure		Impact of hedging instruments	Debt structure after hedging	
(in millions of euros)	amount	% of debt	amount	amount	% of debt
Fixed rates	62,128	92%	(21,035)	41,093	61%
Floating rates	5,252	8%	21,035	26,287	39%
LOANS AND OTHER FINANCIAL LIABILITIES	**67,380**	**100%**	**-**	**67,380**	**100%**

A large portion of the EDF group's fixed-rate loans is swapped to variable rates.

18.3.4 Early repayment clauses

Project financing loans to EDF Renewables from non-Group parties generally include early repayment clauses, mainly applicable when the project company concerned fails to maintain a minimum Debt Service Coverage Ratio (DSCR). In general, early repayment clauses are activated when this ratio falls below 1.

In other Group entities, certain clauses contained in contracts for financing or other commitments may make reference to Group ratings but are not classified as covenants.

Three borrowings with a combined total of €1,150 million contain a rendezvous clause requiring contact between the borrower and lender if the borrower's rating falls below a specified level, possibly leading to renegotiation of the terms of the loan.

No early repayment took place in 2020 as a result of any Group entity's failure to comply with contractual clauses concerning loans.

18.4 Unused Credit lines

In 2019, EDF signed 3 renewable credit lines, each one for €300 million, respectively with BBVA, the Crédit Agricole group and Société Générale CIB.

These three credit facilities incorporate an adjustment mechanism that links their cost to three of the Group's sustainability KPIs: direct CO_2 emissions, use of online consumption monitoring tools by its French residential customers (as a proxy for EDF's success in getting French residential customers actively engaged with their energy consumption), and electrification of its light vehicle fleet.

On 30 October 2020 EDF and Standard Chartered Bank signed a €200 million renewable credit facility. The cost of this facility will be indexed on three EDF group sustainability KPIs: EDF's direct CO_2 emissions, electrification of its light vehicle fleet, and use of online consumption monitoring tools by its French residential customers (see note 20.3.2).

At 31 December 2020, the Group has unused credit lines with various banks totalling €11,110 million (€10,490 million at 31 December 2019), including €5,650 million of credit lines indexed on ESG criteria.

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1-5 years	> 5 years	Total
CONFIRMED CREDIT LINES	**11,110**	**1,808**	**8,483**	**819**	**10,490**

18.5 Fair value of financial instruments

Accounting principles and methods

Financial instruments are stated at fair value, which corresponds to the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction on the principal or most advantageous market at the measurement date. The valuation methods for each level are generally as follows:

- level 1 (unadjusted quoted prices): prices accessible to the entity at the measurement date on active markets, for identical assets or liabilities;
- level 2 (observable data): data concerning the asset or liability, other than the market prices included in initial level 1 input, which are directly observable (such as a price) or indirectly observable (*i.e.* deduced from observable prices);
- level 3 (non-observable data): data that are not observable on a market, including observable data that have been significantly adjusted.

The distribution of financial assets and liabilities in the balance sheet by level is as follows.

At 31 December 2020

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,563	1,563	24	1,121	418
Debt securities	42,802	42,802	2,423	40,337	42
Hedging derivatives	5,439	5,439	59	5,372	8
Trading derivatives	5,038	5,038	289	4,057	692
Cash equivalents	438	438	343	95	-
FINANCIAL ASSETS CARRIED AT FAIR VALUE	**55,280**	**55,280**	**3,138**	**50,982**	**1,160**
Receivables from the NLF	13,034	13,034	-	13,034	-
Other loans and financial receivables	3,271	3,271	-	3,271	-
FINANCIAL ASSETS CARRIED AT AMORTISED COST	**16,305**	**16,305**	**-**	**16,305**	**-**
Hedging derivatives	2,792	2,792	1	2,791	-
Trading derivatives	5,125	5,125	290	4,645	190
FINANCIAL LIABILITIES CARRIED AT FAIR VALUE	**7,917**	**7,917**	**291**	**7,436**	**190**
Loans and other financial liabilities	65,591	75,680	-	75,680	-
FINANCIAL LIABILITIES CARRIED AT AMORTISED COST	**65,591**	**75,680**	**-**	**75,680**	**-**

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

At 31 December 2019

(in millions of euros)	Balance sheet value	Fair value	Level 1 Unadjusted quoted prices	Level 2 Observable data	Level 3 Non-observable data
Equity securities	1,603	1,603	15	1,002	586
Debt securities	44,554	44,554	3,718	40,798	38
Hedging derivatives	5,759	5,759	15	5,731	13
Trading derivatives	6,813	6,813	53	6,244	516
Cash equivalents	236	236	156	80	-
FINANCIAL ASSETS CARRIED AT FAIR VALUE	**58,965**	**58,965**	**3,957**	**53,855**	**1,153**
Receivables from the NLF	13,303	13,303	-	13,303	-
CSPE receivable	684	688	-	688	-
Other loans and financial receivables	2,904	2,904	-	2,904	-
FINANCIAL ASSETS CARRIED AT AMORTISED COST	**16,891**	**16,895**	**-**	**16,895**	**-**
Hedging derivatives	1,830	1,830	5	1,825	-
Trading derivatives	6,327	6,327	38	5,914	375
FINANCIAL LIABILITIES CARRIED AT FAIR VALUE	**8,157**	**8,157**	**43**	**7,739**	**375**
Loans and other financial liabilities	67,380	75,407	-	75,407	-
FINANCIAL LIABILITIES CARRIED AT AMORTISED COST	**67,380**	**75,407**	**-**	**75,407**	**-**

Level 3 debt and equity securities are principally non-consolidated investments carried at historical value.

18.6 Market and counterparty risks

As an operator in the energy sector worldwide, the EDF group is exposed to financial market risks, energy market risks and counterparty risks. All these risks could generate volatility in the financial statements.

A more detailed description of these risks and the sensitivity analyses required by IFRS 7 can be found in section 5.1.6 "Management and control of market risks" of Universal Registration Document 2020.

Financial market risks

The main financial market risks to which the Group is exposed are the liquidity risk, the foreign exchange risk, the interest rate risk and the equity risk.

The objective of the Group's liquidity risk management is to seek resources at optimum cost and ensure their constant accessibility.

The foreign exchange risk relates to the diversification of the Group's businesses and geographical locations, and results from exposure to the risk of exchange rate fluctuations. These fluctuations can affect the Group's translation differences, balance sheet items, financial expenses, equity and net income.

The interest rate risk results from exposure to the risk of fluctuations in interest rates that can affect the value of assets invested by the Group, the value of the liabilities covered by provision, or its financial expenses.

The Group is exposed to equity risks, particularly through its dedicated asset portfolio held for secure financing of long-term nuclear commitments, through external pension funds, and to a lesser extent through its cash assets and directly-held investments.

Energy market risks

With the opening of the final customer market, development of the wholesale markets and international business expansion, the EDF group operates on deregulated energy markets, mainly in Europe, through its generation and supply activities. This exposes the Group to price variations on the wholesale markets for energy (electricity, gas, coal, oil products) and the CO_2 emissions quota market, with a potentially significant impact on the financial statements.

Counterparty risks

Counterparty risk is defined as the total loss that the EDF group would sustain on its business and market transactions if a counterparty defaulted and failed to perform its contractual obligations.

Regarding the customer risk, which is another component of the counterparty risk, a statement of receivables not yet due and overdue is shown in note 13.3.1.

18.7 Derivatives and hedge accounting

Accounting principles and methods

The Group uses derivatives such as swaps and forward contracts to hedge its interest rate, foreign exchange, energy and commodity risks.

In accordance with IFRS 9, hedge accounting can be applied to derivatives when they meet certain eligibility criteria. Some derivatives classified as "own use" are excluded from application of IFRS 9.

Derivatives not covered by IFRS 9: "own use" contracts

Forward purchase and sale contracts for physical delivery of energy or commodities are considered to fall outside the scope of application of IFRS 9 when they are entered into as part of the Group's normal business activity ("own use"). This is demonstrated to be the case when all the following conditions are fulfilled:

- a physical delivery takes place under all such contracts;
- the volumes purchased or sold under these contracts correspond to the Group's operating requirements;
- the contracts cannot be considered as options as defined by the standard. In the specific case of electricity sale contracts, the contract is equivalent to a firm forward sale or can be considered as a capacity sale.

The Group considers that transactions negotiated with a view to balancing the volumes between electricity purchase and sale commitments are part of its normal business as an integrated electricity operator, and are thus outside the scope of IFRS 9.

Measurement and recognition of derivatives

Derivatives are initially recorded at fair value, based on quoted prices and market data available from external sources. If no quoted prices are available, the Group may refer to recent comparable transactions or, if no such transactions exist, base its valuation on internal models that are recognised by market participants, giving priority to information directly derived from observable data such as over-the-counter listings.

In application of IFRS 13, the fair value of derivatives incorporates the counterparty credit risk for derivative assets and the own credit risk for derivative liabilities.

Derivatives classified as hedges

The EDF group uses derivatives to hedge its foreign exchange and interest rate risks, as well as risks related to certain commodity contracts.

The Group applies the criteria defined by IFRS 9 to identify operations subject to hedge accounting, particularly regarding the existence of formal documentation from their inception and compliance with hedge effectiveness requirements.

The hedging relationship ends when it ceases to satisfy the above criteria. This includes situations in which the hedging instrument expires or is sold, terminated or exercised, or when the risk management objectives initially defined are no longer met.

Only derivatives external to the Group, and internal derivatives that are matched with similar transactions external to the Group, qualify for hedge accounting.

The Group uses the following categories for hedges:

- fair value hedge;
- cash flow hedge;
- net foreign investment hedge.

Hedge categories

Fair value hedge

This is a hedge of exposure to changes in the fair value of an asset or liability recorded in the balance sheet, or a firm commitment to purchase or sell an asset. Changes in the fair value of the hedged item attributable to the hedged component of that item are recorded in profit and loss and offset by corresponding variations in the fair value of the hedging instrument. Only the ineffective portion of the hedge has an impact on profit and loss.

Some loans and financial liabilities are covered by a fair value hedge. In such cases their balance sheet value is adjusted for changes in fair value attributable to the hedged risks (foreign exchange and interest rate risks).

Cash flow hedge

This is a hedge of exposure to variability in cash flows associated with an asset or liability or a highly probable future transaction for which variations in cash flows generated by the hedged item are offset by changes in the value of the hedging instrument.

The effective portion of accumulated changes in the hedging instrument's fair value is recorded in equity, and the ineffective portion (*i.e.* changes in the fair value of the hedging instrument in excess of changes in the fair value of the hedged item) is recorded in profit and loss.

When the hedged cash flows materialise, the amounts previously recognised in equity are recycled to profit and loss in the same way as for the hedged item, or are treated as an adjustment to the value of the non-financial asset acquired.

Net foreign investment hedge

This is a hedge of exposure to the foreign exchange risk related to a net investment in an entity which does not have the same functional currency as the Group. The effective portion of accumulated changes in the hedging instrument's fair value is recorded in equity until the disposal or liquidation of the net investment, when it is included in the gain or loss on disposal. The ineffective portion (defined in the same way as for cash flow hedges) is recorded directly in profit and loss.

This risk is hedged in the EDF group level either by matching it with debts in the same currency, or by using derivatives.

Trading derivatives

Trading derivatives comprise:

- derivatives subscribed for economic hedging that do not qualify as hedges for accounting purposes; changes in the value of these instruments are reported in profit and loss. When the derivatives are used for economic hedging of negotiable debt instruments and purchased bonds, they are included in "Other financial income and expenses". When the derivatives are used for economic hedging of generation and supply operations, they are included in "Net changes in fair value on Energy and Commodity derivatives, excluding trading activities" (see note 6);
- derivatives used in trading activities; changes in the fair value of these instruments are included in sales (see note 5.1).

18.7.1 Breakdown of hedging and trading derivatives

The fair value of hedging and trading derivatives reported in the balance sheet breaks down as follows:

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Positive fair value of hedging derivatives	*18.1.1*	5,439	5,759
Negative fair value of hedging derivatives	*18.3.1*	(2,792)	(1,830)
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**
Positive fair value of trading derivatives	*18.1.1*	5,038	6,813
Negative fair value of trading derivatives	*18.3.1*	(5,125)	(6,327)
FAIR VALUE OF TRADING DERIVATIVES		**(87)**	**486**

The fair value of hedging and trading derivatives by type of risk hedged is shown below:

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Hedging derivatives – interest rate risk	*18.7.2*	3,149	2,939
Hedging derivatives – foreign exchange risk	*18.7.3*	(733)	877
Hedging derivatives – commodity risks	*18.7.4*	231	113
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**
Trading derivatives – interest rate risk	*18.7.2*	(25)	(22)
Trading derivatives – foreign exchange risk	*18.7.3*	4	(185)
Trading derivatives – commodity risk	*18.7.4*	(66)	693
FAIR VALUE OF TRADING DERIVATIVES		**(87)**	**486**

The fair value of hedging derivatives by type and purpose of hedge is shown below:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Fair value hedges of loans and liabilities		3,724	3,474
Cash flow hedges of loans and liabilities		(1,738)	(87)
Sub-total	***19.2***	**1,986**	**3,387**
Fair value hedges of commodity contracts		6	106
Cash flow hedges of commodity contracts		170	138
Sub-total		**176**	**244**
Net foreign investment hedges		280	261
Fair value hedges of dedicated assets		205	37
FAIR VALUE OF HEDGING DERIVATIVES		**2,647**	**3,929**

18.7.2 Interest rate derivatives

The Group is exposed to the risk of fluctuations in interest rates that can affect the value of its loans and financial liabilities, its assets (liquid assets and dedicated assets), and its future financial expenses.

The Group hedges its exposure to changes in the fair value of fixed-rate debts, many of which are converted to floating rates. The derivatives used for these hedges are fixed/floating interest rate swaps and cross-currency swaps, with changes in fair value recorded in profit and loss symmetrically to changes in the value of the hedged debts.

The Group also hedges its floating-rate debt against future changes in interest rates by using floating/fixed interest rate swaps for cash flow hedges.

Details of interest rate derivatives used in a hedging relationship or designated as trading derivatives are shown below:

	Notional at 31/12/2020				Notional at 31/12/2019	Fair Value	
(in millions of euros)	< 1 year	1-5 years	> 5 years	Total	Total	31/12/2020	31/12/2019
Fixed rate payer/floating rate receiver	111	1,301	4,511	5,923	2,733	(144)	(51)
Floating rate payer/fixed rate receiver	1,400	4,612	14,666	20,678	23,633	4,143	3,143
Floating rate/floating rate	-	800	1,508	2,308	2,447	3	60
Fixed rate/fixed rate	764	682	8,152	9,598	9,901	(853)	(213)
Interest rate swaps	**2,275**	**7,395**	**28,837**	**38,507**	**38,714**	**3,149**	**2,939**
INTEREST RATE DERIVATIVES – HEDGING	**2,275**	**7,395**	**28,837**	**38,507**	**38,714**	**3,149**	**2,939**
Interest rate operations	**-**	**-**	**515**	**515**	**520**	**8**	**14**
Interest rate swaps	**1,379**	**1,954**	**612**	**3,945**	**5,181**	**(33)**	**(36)**
INTEREST RATE DERIVATIVES – TRADING	**1,379**	**1,954**	**1,127**	**4,460**	**5,701**	**(25)**	**(22)**

The fair value of interest rate/exchange rate cross-currency swaps comprises the interest rate effect only.

The notional value of cross-currency swaps is included both in this note and the note on currency derivatives (see note 18.7.3).

18.7.3 Currency derivatives

The Group is exposed to the risk of exchange rate fluctuations due to the diversification of its businesses, supply contracts in foreign currencies for goods and services, and its geographical locations. These fluctuations can affect the Group's translation differences recognised in equity, balance sheet items, financial expenses, equity and net income.

There are several types of hedged item:

- liabilities in foreign currencies, for which cross-currency swaps are used in cash flow hedge;
- financial assets subscribed in foreign currencies;
- purchases of commodities and fuels, for which the Group hedges the associated foreign exchange risk;
- net investments in subsidiaries in foreign currencies.

Details of currency derivatives used in a hedging relationship or designated as trading derivatives are shown in the following tables. The notional value of cross-currency swaps is included both in this note and the note on interest rate hedging derivatives (see note 18.7.2).

At 31 December 2020

	Notional amount to be received at 31/12/2020				Notional amount to be given at 31/12/2020				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	Total	< 1 year	1-5 years	> 5 years	Total	31/12/2020
Forward exchange transactions	1,480	91	-	1,571	1,473	91	-	1,564	(1)
Swaps	20,394	6,891	16,368	43,653	20,090	6,933	17,152	44,175	(745)
Options	355	-	-	355	326	-	-	326	13
CURRENCY DERIVATIVES – HEDGING	**22,229**	**6,982**	**16,368**	**45,579**	**21,889**	**7,024**	**17,152**	**46,065**	**(733)**
Forward transactions	3,389	6,490	-	9,879	3,380	6,491	-	9,871	4
Swaps	14,576	5,180	275	20,031	14,606	5,162	255	20,023	-
Options	10	-	-	10	11	-	-	11	-
CURRENCY DERIVATIVES – TRADING	**17,975**	**11,670**	**275**	**29,920**	**17,997**	**11,653**	**255**	**29,905**	**4**

At 31 December 2019

	Notional amount to be received at 31/12/2019				Notional amount to be given at 31/12/2019				Fair value
(in millions of euros)	< 1 year	1-5 years	> 5 years	Total	< 1 year	1-5 years	> 5 years	Total	31/12/2019
Forward exchange transactions	1,843	1,357	-	**3,200**	1,838	1,526	-	**3,364**	3
Swaps	19,619	6,566	17,367	**43,552**	19,006	6,268	16,892	**42,166**	874
CURRENCY DERIVATIVES – HEDGING	**21,462**	**7,923**	**17,367**	**46,752**	**20,844**	**7,794**	**16,892**	**45,530**	**877**
Forward transactions	4,220	3,280	-	**7,500**	4,187	3,262	-	**7,449**	29
Swaps	14,203	6,387	198	**20,788**	14,328	6,536	198	**21,062**	(214)
CURRENCY DERIVATIVES – TRADING	**18,423**	**9,667**	**198**	**28,288**	**18,515**	**9,798**	**198**	**28,511**	**(185)**

The notional value of cross-currency swaps shown in this note is also included in the note on interest rate derivatives (see note 18.7.2).

18.7.4 Commodity derivatives

The Group is exposed to price variations on the wholesale markets for energy (electricity, gas, coal, oil products) and the CO_2 emissions quota market with a potentially significant impact on the financial statements.

The Group hedges its forecast sales and purchases of electricity, gas, and coal using futures, forwards, options and swaps, essentially through cash flow hedges.

Details of commodity derivatives used for hedging are as follows:

		31/12/2020					31/12/2019	
		Net notional						
(in millions of euros)	Units of measure	< 1 year	1-5 years	> 5 years	Total	Fair value	Net notional	Fair value
Electricity	TWh	(9)	(15)	-	(25)	35	(49)	393
Gas	Millions of therms	1,083	1,048	-	2,131	102	2,253	(398)
Oil products	Thousands of barrels	3,062	6,548	-	9,610	18	13,637	2
CO_2	Thousands of tonnes	4,501	3,424	-	7,925	76	26,666	44
Coal	Millions of tonnes	(1)	-	-	(1)	-	(416)	72
COMMODITY DERIVATIVES – HEDGING		**8,636**	**11,005**	**-**	**19,640**	**231**	**42,091**	**113**

Details of commodity derivatives used for trading are as follows:

		31/12/2020		31/12/2019	
(in millions of euros)	Units of measure	Net notional	Fair value	Net notional	Fair value
Electricity	TWh	(174)	(380)	(17)	824
Gas	Millions of therms	(6,803)	310	(7,826)	76
Oil products	Thousands of barrels	24,301	58	14,290	8
CO_2	Thousands of tonnes	3,355	(55)	(41,604)	(128)
Coal and freight	Millions of tonnes	1	(7)	2	(12)
Other commodities		-	8	-	(75)
COMMODITY DERIVATIVES – TRADING		**20,680**	**(66)**	**(35,155)**	**693**

These instruments mainly include contracts included in EDF Trading's portfolio.

18.7.5 Impact of hedging derivatives on comprehensive income

Changes in the fair value of hedging derivatives included in equity (EDF share) and profit and loss are detailed below:

	2020			2019		
(in millions of euros)	Gross changes in fair value recorded in equity [1]	Gross changes in fair value transferred to income – Recycling [2]	Gross changes in fair value transferred to income – Ineffectiveness	Gross changes in fair value recorded in equity [1]	Gross changes in fair value transferred to income – Recycling [2]	Gross changes in fair value transferred to income – Ineffectiveness
Interest rate hedging	(24)	-	-	(39)	(106)	3
Exchange rate hedging	(850)	51	13	(200)	(156)	(17)
Net foreign investment hedging	661	-	-	(416)	(448)	-
Commodity hedging	644	430	(14)	1,482	719	3
HEDGING DERIVATIVES [3]	**431**	**481**	**(1)**	**827**	**9**	**(11)**

(1) +/( ): increase/(decrease) in equity (EDF share).
(2) +/( ): increase/(decrease) in net income (EDF share).
(3) Excluding associates and joint ventures.

The amount transferred to operating profit before depreciation and amortisation in 2020 is €430 million in respect of commodity hedges comprises:

- €818 million for electricity hedging contracts, mainly concerning the United Kingdom and the France – Generation and supply segments;
- €(452) million for gas hedging contracts, concerning the France – Generation and supply segment;
- €64 million for other hedging contracts.

18.7.6 Offsetting of financial assets and liabilities

Accounting principles and methods

A financial asset and financial liability must be netted if the entity currently has a legally enforceable right to do so and intends either to settle the net amount or to realise the asset and settle the liability simultaneously.

At 31 December 2020

			Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
(in millions of euros)	As reported in balance sheet	Balance without offsetting	Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	Net amount recognised after offsetting under IAS 32	Financial instruments	Fair value of financial collateral	Net amount
Fair value of derivatives – assets	10,477	2,956	11,091	(3,570)	7,521	(1,672)	(2,797)	3,052
Fair value of derivatives – liabilities	(7,917)	(2,927)	(8,560)	3,570	(4,990)	1,672	568	(2,750)

At 31 December 2019

			Balance with offsetting under IAS 32			Amounts covered by a general offsetting agreement but not offset under IAS 32		
(in millions of euros)	As reported in balance sheet	Balance Without offsetting	Gross amount recognised (before offsetting)	Gross amount offset under IAS 32	Net amount recognised after offsetting under IAS 32	Financial instruments	Fair value of financial collateral	Net amount
Fair value of derivatives – assets	12,572	3,752	13,300	(4,480)	8,820	(1,298)	(3,097)	4,425
Fair value of derivatives – liabilities	(8,157)	(3,785)	(8,852)	4,480	(4,372)	1,298	531	(2,543)

Note 19 Financial indicators

The financial indicators are not defined by the accounting standards and are not directly visible in the Group's financial statements. The principal financial indicators are the following.

19.1 Net income excluding non-recurring items

Net income excluding non-recurring items corresponds to the Group's share of net income (EDF net income) excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.

The following tables show the transition from EDF net income to net income excluding non-recurring items:

At 31 December 2020

		2020			
(in millions of euros)	***Notes***	**Gross value**	**Income taxes**	**Non-controlling interests**	**EDF net income**
Net income					**650**
Changes in the fair value of debt and equity instruments [1]	***8.3***	**(1,248)**	**377**	**(2)**	**(873)**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	***6***	**175**	**(51)**	**-**	**124**
Impairment		**1,111**	**(156)**	**(111)**	**844**
• *impairment of fixed assets*	*10.8.1 and 10.8.2*	*799*	*(156)*	*(102)*	*541*
• *impairment of investments in associates and joint ventures*	*12.3*	*195*	*-*	*(6)*	*189*
• *impairment of Edison's E&P operations (application of IFRS 5)*	*3.2.2*	*117*	*-*	*(3)*	*114*
Other items		**809**	**414**	**1**	**1,224**
• *other operating income and expenses [2]*	*7*	*487*	*(153)*	*1*	*335*
• *tax litigations*	*9.2*	*-*	*537*	*-*	*537*
• *change of income tax rate in the United Kingdom*	*9.2*	*-*	*121*	*-*	*121*
• *accelerated depreciation of thermal power plants in France*	*10.3*	*250*	*(80)*	*-*	*170*
• *other*		*72*	*(11)*	*-*	*61*
NET INCOME EXCLUDING NON-RECURRING ITEMS					**1,969**

(1) Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.

(2) In 2020 other income and expenses notably include exceptional additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR, totalling €(397) million.

The net income excluding non-recurring items amounts to €1,969 million at 31 December 2020, down by €1,902 million compared to 2019.

At 31 December 2019

(in millions of euros)	Notes	2019 Gross value	Income taxes	Non-controlling interests	EDF net income
Net income					**5,155**
Changes in the fair value of debt and equity instruments [1]	***8.3***	**(2,703)**	**923**	**-**	**(1,780)**
Net changes in fair value on Energy and Commodity derivatives, excluding trading activities	***6***	**(642)**	**152**	**-**	**(490)**
Impairment		**989**	**(70)**	**(36)**	**883**
● *impairment of fixed assets*	*10.8.1 and 10.8.2*	*403*	*(70)*	*(23)*	*310*
● *impairment of investments in associates and joint ventures*	*12.3*	*73*	*-*	*-*	*73*
● *impairment of Edison's E&P operations (application of IFRS 5)*	*3.2.2*	*513*	*-*	*(13)*	*500*
Other items		**269**	**(172)**	**6**	**103**
● *other operating income and expenses* [2]	*7*	*185*	*(144)*	*6*	*47*
● *accelerated depreciation of thermal power plants in France*	*10.3*	*141*	*(49)*	*-*	*92*
● *other*		*(57)*	*21*	*-*	*(36)*
NET INCOME EXCLUDING NON-RECURRING ITEMS					**3,871**

(1) Including fair value hedges of dedicated assets and changes in the fair value of debt and equity instruments comprised in investments in associates and joint ventures.

(2) In 2019 other income and expenses principally comprised the €(30) million cost of the ERO employee shareholding offer, restructuring expenses in certain entities, and other operations of non-significant amounts individually.

19.2 Net indebtedness

Net indebtedness comprises total loans and financial liabilities, less cash and cash equivalents and liquid assets. Liquid assets are financial assets consisting of funds or interest rate instruments with initial maturity of over three months that are readily convertible into cash and are managed according to a liquidity-oriented policy.

Net indebtedness are as follows:

(in millions of euros)	Notes	31/12/2020	31/12/2019
Loans and other financial liabilities	*18.3.2*	65,591	67,380
Derivatives used to hedge liabilities	*18.7.1*	(1,986)	(3,387)
Cash and cash equivalents	*18.2*	(6,270)	(3,934)
Debt and equity securities – liquid assets	*18.1.2*	(15,028)	(18,900)
Net indebtedness of assets held for sale	*3.2.1*	(17)	(26)
NET INDEBTEDNESS		**42,290**	**41,133**

The Group's net indebtedness amounts to €42,290 million at 31 December 2020 (€41,133 million at 31 December 2019). The ratio of net indebtedness to operating proft before depreciation and amortisation at 31 December 2020 is 2.61.

Note 20 Sustainable development and climate action

In coherence with its *raison d'être*, "To build a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive well-being and economic development", in February 2020 the EDF group, along with more than 300 other companies worldwide (as of December 2020), signed up to the "Business Ambition for 1.5 degrees" commitment to achieve carbon neutrality, a target set in line with the Paris Climate Agreement.

Following this commitment, on the fifth anniversary of the Paris Climate Agreement, the Group's reinforced CO_2 emission-cutting trajectory was officially validated by the Science Based Targets initiative as "well below 2°C", and it set up dedicated governance arrangements aligned with best practices as recommended by the Taskforce on Climate-Related Financial Disclosure (see the press release of 10 December 2020).

The Group's financial statements reflect issues relating to climate change and sustainable development through the implementation of its investment and divestment strategy and a sustainable financing strategy, through expenditure incurred specifically in response to environmental issues, particularly under applicable laws and regulations, and also through the valuation methods used for the Group's assets and liabilities.

20.1 Regulatory expenses

The regulatory frameworks and accounting principles for greenhouse gas emission rights, renewable energy certificates and energy savings certificates are presented in notes 5.4.3, 10.2 and 17.2.

20.1.1 Greenhouse gas emission rights

The European Union's Emissions Trading System (EU ETS) exists to fight climate change and reduce greenhouse gas emissions.

This system, which has been incorporated into national laws, sets an annual cap on emissions. Businesses (including EDF) receive or buy emission quotas, then the following year surrender to the European Commission a number of greenhouse gas emission rights corresponding to their emissions for the year elapsed. Fines are payable if there is a shortfall (€110 per tonne of CO_2 not covered by quotas, and an obligation to cover these amounts by quota the following year).

The cap is being progressively reduced in order to bring down the total emissions in Europe.

One of the main features of the third phase of the ETS (2013 to 2020) is the discontinuation of free allocation of emission rights to electricity producers in all EU countries (except certain Eastern European countries which, subject to approval from the European Commission, were allowed to give away some of their quotas free of charge).

The legislative framework of the EU-ETS for the next trading period (phase 4: 2021-2030) was revised in early 2018 to contribute to achievement of emission reduction targets in line with the 2030 Climate and Energy framework and the EU's contribution to the Paris Climate Agreement adopted in 2015. Key measures of the revision were increasing the reductions in quotas to 48 million tonnes per year (2.2% lower than the 2010 allocations), continuing free allocation of quotas within certain limits for sectors exposed to risks of carbon leakage and the electricity sector in highly coal-dependent countries, subject to certain criteria. In France, the Energy and Climate law of 8 November 2019 introduced a cap on greenhouse gas emissions, applicable from 1 January 2022.

In the EDF group, the entities concerned by application of this Directive are EDF, EDF Energy, Edison, Dalkia, PEI and Luminus.

The Group's total emission rights allocation in 2020 for Scope 1, *i.e.* direct greenhouse gas emissions from electricity and heat production, recorded in the EU-ETS Transaction Log, was 0 million tonnes (1 million tonnes for 2019).

The volume of emissions at 31 December 2020 stood at 19 million tonnes (21 million tonnes for 2019).

Over-quota greenhouse gas emissions by the Group amount to €260 million at 31 December 2020 (€414 million at 31 December 2019), and are recorded in balance sheet provisions.

Greenhouse gas emissions are a component of intangible assets related to environmental regulations, and had a net value of €769 million at 31 December 2020.

In compliance with the obligation to surrender a number of greenhouse gas emission rights equivalent to its emissions, in 2020, according to the best estimate, the Group surrendered 21 million tonnes under the EU-ETS scheme in respect of emissions generated in 2019 (in 2019, it surrendered 26 million tonnes of emission rights in respect of emissions generated in 2018).

20.1.2 Renewable energy certificates (green certificates)

To encourage use of renewable energy produced from renewable sources, every EU member state has set itself national targets for consumption of electricity from renewable sources. Guarantee of Origin certificates prove the renewable origins of the electricity, which transits through the grid. They are sold by operators of renewable energy plants and bought by customers who want to use renewable-source electricity.

There are two ways for States to meet their targets:

- incorporating the costs of these certificates into the sale price for electricity (this is the approach taken in France);
- introducing an obligation to surrender a certain volume of renewable energy certificates depending on the level of sales to customers (as is the case in the United Kingdom, Italy and Belgium).

The renewable energy certificate system may apply to:

- non-obligated electricity producers when the obligation applies to sales (EDF Renewables);
- obligated electricity producers when the obligation applies to generation;
- electricity producers who are also sellers of electricity when the obligation applies to energy sales (EDF Energy, Edison and Luminus).

A provision of €932 million was recognised at 31 December 2020 concerning the obligations for renewable energy certificates to be surrendered at that date, essentially by EDF Energy (United Kingdom) and Luminus (Belgium). A large portion of these obligations are covered by purchased certificates recorded in intangible assets.

20.1.3 Energy savings certificates

In all its subsidiaries, the Group is engaged in a process to control its energy consumption through various measures developed by national legislation in application of European Union Directives.

In the United Kingdom for example, EDF Energy helps companies explore and develop solutions by enabling them to save energy, carbon and costs, particularly through its Powershift flexibility platform.

In France, the Law of 13 July 2005 introduced a system of energy savings certificates, imposing energy savings obligations on suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level. At the end of the period concerned, obligated actors are required to present energy savings certificates that correspond to their obligatory energy savings, otherwise sanctions apply. These certificates are obtained in return for energy savings operations conducted directly or indirectly, or purchased from other obligated or "eligible" economic actors.

On 1 January 2018 the energy savings certificates scheme began its fourth period, extended by one year to last 4 years. The EDF group has three sources of action to meet this obligation: supporting consumers in energy efficiency operations, for instance by carrying out renovations (277,000 renovation projects were completed in 2020, 20% more than in 2019), funding State-approved programmes, and purchasing certificates from eligible actors.

At 31 December 2020, the Group is confident that it can fulfil its obligations.

20.2 Valuation of assets and liabilities

20.2.1 Provisions for environmental risks

Provisions related to nuclear generation comprise provisions for back-end nuclear cycle expenses (management of spent fuel and radioactive waste), provisions for plant decommissioning and provisions for last cores. Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved. Details of these provisions are provided in notes 15 and 17.

Provisions related to environmental schemes include provisions for greenhouse gas emission rights, renewable energy certificates and energy savings certificates. In 2020, these provisions totalled €1,192 million (€1,517 million in 2019, see note 17.2).

Contingent liabilities also exist in connection with environmental litigation, such as the dispute concerning the Ausimont SpA industrial complex. These liabilities are described in note 17.3.

20.2.2 Valuation of assets

Climate issues are taken into account in valuing long-term assets through impairment testing. The long-term scenarios used for electricity prices in countries where the Group does business are consistent with the trajectories of European decarbonisation targets, particularly as set in the Paris climate agreement (see note 10.8).

Significant impairment has been booked on most of the thermal assets controlled by the Group in recent years (see note 13 to the consolidated financial statements at 31 December 2015 and similar notes to the financial statements of subsequent years).

20.3 Sustainable financing

20.3.1 Green Bonds

Since 2013 the Group has made five Green Bond issues for a value equivalent to €4.5 billion, in order to support its development in renewable energies. It has invested around €2.5 billion per year to such operations.

After the two Green Bond issues chiefly intended to finance the building of new wind and solar power projects by its subsidiary EDF Renewables (€1.4 billion in November 2013 and $1.25 billion in October 2015), the Group expanded its Green Bond Framework to finance investments in the renovation and modernisation of its hydropower assets in mainland France.

The new Framework was first applied to a €1.75 billion issue in October 2016 and then to a JPY 26 billion issue in two tranches in January 2017. The Group extended the scope of its Green Bond Framework further in early 2020 by opening it up to international hydropower assets, energy efficiency projects and biodiversity conservation projects.

On 8 September 2020, EDF made a landmark offering of unsecured senior Green Bonds convertible into new shares and/or exchangeable for existing shares of the Company (*OCEANEs Vertes*) maturing in 2024, for the nominal amount of approximately €2.4 billion.

This was the largest convertible bond issue in Europe since 2003 (excluding bonds redeemable in shares), the largest convertible Green Bond issue ever undertaken, and the largest Green Bond issue ever by a European corporate issuer.

The Green Bonds are included in the Group's borrowings, see note 18.3.2. Allocation of the funds raised by EDF's Green Bond issues is certified by one of the Statutory Auditors: see section 6.7 of the Universal Registration Document.

20.3.2 Credit lines indexed on ESG criteria

The EDF group is strongly committed to Corporate Social Responsibility (CSR) and advocates closer ties between non-financial performance and financing strategy.

The credit lines indexed to the Group's sustainable development performance incorporate a cost adjustment mechanism.

EDF SA has a €4 billion syndicated credit line with more than 20 banks that incorporate a margin adjustment mechanism linked to Group performance on three KPIs: direct CO_2 emissions, French residential customers' use of online consumption monitoring tools, and electrification of EDF's light vehicle fleet.

The Group has also signed 7 renewable bilateral credit lines indexed on ESG criteria (incorporating a cost adjustment mechanism based on the Group's performance on certain KPIs or its rating by a nonfinancial ratings agency), amounting to a total €1.6 billion.

At 31 December 2020, ESG-indexed renewable credit lines, which were undrawn, totalled over €5.6 billion, or 51% of the EDF group's total undrawn credit facilities (see note 18.4).

The selected KPIs reflect the EDF group's major environmental commitments, principally cutting greenhouse gas emissions (CO_2) by 50% by 2030, closing down coal-fired plants in France and the United Kingdom with a view to achieving carbon neutrality by 2050, and completing electrification of the whole EDF group vehicle fleet by 2030. The focus on consumption monitoring tools reflects the Group's ambition to provide its customers with energy solutions appropriate to their needs.

They are a concrete illustration of EDF's *raison d'être*, which was enshrined in the Group's articles of association in May 2020.

20.4 Sustainable investments, research and development, and other expenditure for protection of the environment and the climate

20.4.1 Sustainable investments

In 2020 the Group continued its programme of gross operating investments, which amounted to €16.5 billion gross and included €16 billion of gross investments in intangible assets and property, plant and equipment (see notes 4 and 10.7) and €0.5 billion of gross financial investments.

As part of its work on the European taxonomy for sustainable activities, the Group has estimated its rate of gross operating investments validated as green by the European Union. Under the chosen methodology these investments do not include gross financial investments or "corporate" investments such as renewal of IT equipment or vehicle fleets.

In 2020, close to 94% of the Group's investments met its low-carbon objectives: 51% of investments concerned the nuclear sector, and 43% were compliant with the European taxonomy for sustainable activities (by a method currently based on the Technical Expert Group report of March 2020) notably including production of renewable energies (*e.g.* hydropower, wind and solar power), networks, and energy services. These figures are likely to be revised in the light of changes in "Taxonomy" regulations, particularly when the delegated acts are published in 2021. The low-carbon investment strategy is also reflected in the objective of converting some of the Group's coal or oil-fired units to low-carbon generation methods.

With the Ecocombust project in France, the Group's main objective is to optimise the performance by all of its fossil-fired plants by making innovative, ecological fuel that can be used in heating or electricity-generating installations that currently run on coal. If satisfactory results are achieved by the technical trials and impact studies required under the preliminary work programme validated by EDF and the Ministry for the Ecological and Inclusive Transition, EDF will aim to begin industrial production of this new fuel in 2022. The fuel would then be used for co-firing, with a minority coal component, in the Cordemais plant's boilers from 2022.

EDF is also playing a part in the energy transition through investments in new activities. In 2017, the EDF group created its start-up incubator EDF Pulse Croissance, to explore the ecological and digital transition and provide its clients with innovative, competitive offerings and services. EDF Pulse Croissance is part of the Group's CAP 2030 strategy to develop a portfolio of assets focusing on carbon-free energy, services for customers and decentralised energy solutions.

In 2019 EDF Pulse Croissance invested in start-ups and formed subsidiaries that developed out of entrepreneurial projects. One of these is Hynamics, a subsidiary dedicated to the production and marketing of low-carbon hydrogen from water electrolysis, to meet the needs of industry and heavy-duty transport. Hynamics is also contributing to installing a network of hydrogen charging points across France for heavy-duty electric vehicles such as trains, buses, refuse collection trucks, commercial vehicles and river transport vessels.

As a consequence of the multi-year energy programme (PPE) fixing a final deadline of 2026 for the discontinuation of coal-fired power generation in France, and also due to the Ecocombust project, the ends of the depreciation periods for the Le Havre and Cordemais plants were changed in the first half of 2019 and set at 2021 for Le Havre and 2026 for Cordemais (for Cordemais, the date could still change depending on final decisions to be made about the Ecocombust project).

The Group is also taking action under the PPE for the French island territories, which plans a progressive conversion to liquid biomass for plants that currently run on fuel oil.

Another reflection of the EDF group's commitment to achieving carbon neutrality by 2050 is the management policy applied to its portfolio of dedicated assets held to finance long-term nuclear expenses in France (€33.8 billion at 31 December 2020). The Group has drawn up a responsible investor's charter covering three areas (compliance with the United Nations' Principles for Responsible Investment; respect of the major international agreements on human rights; and an annual report on responsible investments). This charter is applicable both to assets managed directly and assets managed by specialist companies under delegated management arrangements.

In addition, on 17 December 2020, the Group finalised the sale of its Exploration and Production operations to Energean (see notes 1.4.2 and 3.1). The progressive disposal of the hydrocarbons Exploration and Production (E&P) operations is consistent with the priorities of the CAP 2030 strategy.

20.4.2 Research and development (R&D)

Given the goal of carbon neutrality by 2050, and the fact that electricity is a major lever in action to decarbonise the French economy, R&D has a crucial role to play in the electricity, climate, digital and societal transition.

In 2020, the EDF group's total R&D expenditure amounted to €685 million, and EDF's R&D budget for environmental protection was €79 million.

R&D expenditure is particularly channelled into research into energy efficiency, uses of electricity as a substitute for fossil fuel-based energies, renewable energies and their insertion into the grid, energy storage, carbon-free hydrogen and its applications for decarbonising the economy, sustainable cities, the local impacts of climate change and other environmental issues such as biodiversity, water quality, and the mitigation of all forms of pollution.

Research concerning electricity storage, enhancement of energy performance diagnosis methods, improvement of techniques for urban heating and cooling networks, platforms for sharing studies relevant to the ecological transition, and increasing safety at nuclear power plants is supported by public subsidies, notably from the European Union.

Accounting principles and methods for R&D are presented in note 10.2.

20.4.3 Other expenses for protection of the environment and climate

Accounting principles and methods

Other expenses for protection of the environment and climate are identifiable expenses incurred to prevent, reduce or repair damage that has been or may be caused by the Group as a result of its activities. These expenses are treated as follows:

- they are **capitalised** if they are incurred to prevent or reduce future damage or protect resources (*e.g.* expenses for structures to facilitate the passage of migrating fish, effluent treatment installations, etc.);
- they are booked as environmental liabilities and increases to **provisions for environmental risks** if they correspond to an obligation that exists at the year-end and it is probable or certain at the reporting date that they will lead to an outflow of resources;
- they are recognised as expenses if they are **operating expenses** for the units in charge of environmental concerns, environmental supervision, environmental duties and taxes, processing of liquid and gas effluents and non-radioactive waste, or research unrelated to an investment.

All of the Group's functions, employees, activities and projects are mobilised to fulfil EDF's objective of being an environmentally responsible company. Some of the actions concerned are presented below.

Action for biodiversity

The Group takes action associated with France's national biodiversity plan, promoting a positive approach to biodiversity. For example, through its subsidiary EDF Hydro and its hydroelectricity activities, between 2013 and 2020 the Group undertook more than 50 operations to facilitate fish migration at ecologically sensitive sites in mainland France ("list 2" sites for the purposes of the national law on water and aquatic environments), installing fish passes and fish ladders and removing river weirs. These operations benefited from subsidies from the national water agencies.

Action for employees and vehicle fleet electrification

Consistent with its ambitions for the environment and the climate, the Group works to raise awareness among its employees and educate them about environmental and sustainable development issues. In 2020 its "Environment and sustainable development" training offering comprising courses on environmental management, standards and regulations, and environmental analysis, provided 1,545 employees with 12,710 hours of training.

In addition, the rollout at Group level of the "Climate Collage" collaborative workshop, led in person or online by 173 volunteer employees after internal training, gave 3,061 employees greater awareness of the issues of climate disruption.

Furthermore, sustainable and digital development indicators have been introduced that account for 20% of the 2020 employee profit share criteria. These indicators reflect efforts made to reduce paper printouts, and achievement of the "carbon-neutrality passport" training certificate.

As the first French Group to sign the EV100 initiative, EDF made a commitment to have a fully-electric light vehicle fleet by 2030. In 2020 the worldwide fleet numbered slightly more than 45,000 light vehicles (especially in Europe) and more than 12.2% were already electric (over 5,500 electric vehicles, an increase of more than 1,700 from 2019). Joining the EV100 initiative is also an encouragement for Group employees to control their energy consumption and reduce their carbon footprint, as it gives them access to a special agreement with car suppliers and offers for recharging services sold by EDF subsidiaries.

Note 21 Off-balance sheet commitments

This note presents off-balance sheet commitments given and received by the Group at 31 December 2020. The amounts of commitments correspond to non-discounted contractual values.

21.1 Commitments given

The table below shows off-balance sheet commitments given by the Group that have been valued. Other commitments are described separately in the detailed notes.

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Operating commitments given	*21.1.1*	42,235	41,110
Investment commitments given	*21.1.2*	16,494	18,237
Financing commitments given	*21.1.3*	5,536	6,343
TOTAL COMMITMENTS GIVEN		**64,265**	**65,690**

In almost all cases, these are reciprocal commitments, and the third parties concerned are under a contractual obligation to supply the Group with assets or services related to operating, investment and financing activities.

21.1.1 Operating commitments given

Operating commitments given by the Group are as follows:

(in millions of euros)	31/12/2020	31/12/2019
Fuel and energy purchase commitments*	24,715	25,373
Operating contract performance commitments given	17,151	15,248
Operating lease commitments as lessee	369	489
TOTAL OPERATING COMMITMENTS GIVEN	**42,235**	**41,110**

* *Excluding gas purchases and related services*

21.1.1.1 Fuel and energy purchase commitments

In the course of its ordinary generation and supply activities, the Group has entered into long-term contracts for purchases of electricity, gas, other energies and commodities and nuclear fuel, for periods of up to 20 years.

The Group has also entered into long-term purchase contracts with a certain number of electricity producers, by contributing to the financing of power plants.

At 31 December 2020, fuel and energy purchase commitments mature as follows:

	31/12/2020					31/12/2019
		Maturity				
(in millions of euros)	Total	< 1 year	1 to 5 years	5 to 10 years	> 10 years	Total
Electricity purchases and related services [1]	10,574	2,562	4,123	2,121	1,768	9,999
Other energy and commodity purchases [2]	308	64	124	120	-	281
Nuclear fuel purchases	13,833	1,610	5,870	4,374	1,979	15,093
FUEL AND ENERGY PURCHASE COMMITMENTS	**24,715**	**4,236**	**10,117**	**6,615**	**3,747**	**25,373**

(1) Including commitments given by controlled entities to joint ventures, amounting to €533 million at 31 December 2020 (€569 million at 31 December 2019).
(2) Excluding gas purchases and related services (see note 21.1.1.1.4).

21.1.1.1.1 Electricity purchases and related services

Electricity purchase commitments mainly concern EDF and EDF Energy. In the case of EDF many of these commitments are borne by the Island Energy Systems (SEI), which have made commitments to purchase the electricity generated using bagasse and coal.

In addition to the obligations reported above and under Article 10 of the Law of 10 February 2000, in mainland France, EDF is obliged, at the producer's request and subject to compliance with certain technical features, to purchase the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydro-electric plants, photovoltaic power, etc.). The additional costs generated by this obligation are offset, after validation by the CRE, by the CSPE. These purchase obligations total 59TWh for 2020 (57TWh for 2019), including 7TWh for co-generation (7TWh for 2019), 31TWh for wind power (30TWh for 2019), 11TWh for photovoltaic power (11TWh for 2019) and 4TWh for hydropower (3TWh for 2019).

21.1.1.1.2 Other energy and commodity purchases

Purchase commitments for other energies and commodities mainly concern coal and oil used to operate the fossil-fired plants, and purchases of biomass fuel used by Dalkia in the course of its business.

21.1.1.1.3 Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover the EDF group's needs for uranium and fluoration, enrichment and fuel assembly production services.

21.1.1.1.4 Gas purchases and related services

Gas purchase commitments are principally undertaken by Edison and EDF. The volumes concerned for both entities at 31 December 2020 are as follows.

	31/12/2020				31/12/2019
		Maturity			
(in billions of m³)	Total	< 1 year	1 to 5 years	> 5 years	Total
Edison	124	12	44	68	135
EDF	26	2	8	16	24

Gas purchase contracts

Edison has entered into agreements to import natural gas from Russia, Libya, Algeria and Qatar, for a total maximum volume of 12.4 billion m³ per year. The residual terms of these contracts vary between 1 and 14 years.

The contract with Algeria was renewed in 2019 for 1 billion m³ per year until 2027. The long-term contract for gas from Russia terminated in 2019 and Edison signed a new contract for 1 billion m³ for 2020, then for 2021.

These contracts contain "take-or-pay" clauses committing the buyer to pay for a minimum volume of gas every year, whether or not it actually takes delivery of that volume. At 31 December 2020, off-balance sheet commitments relating to Edison's take-or-pay clauses amount to €117 million, corresponding to the value of the volumes of gas not withdrawn at that date and for which delivery is deferred to a subsequent period.

EDF has entered into an import contract for LNG from the United States, concerning an annual supply of 0.7 million tonnes of LNG (1 billion m³ of natural gas per year) for a 20-year period beginning in May 2020.

In 2020, EDF signed a new 5-year contract for 3 billion m³ from Norway.

Gas-related service contracts

Under the contract with Terminale GNL Adriatico, Edison also benefits from approximately 80% of the terminal's regasification capacities until 2034.

Under the contract with the Dunkerque LNG methane terminal, EDF benefits from approximately 61% of the terminal's regasification capacities until 2037, in return for payment of an annual premium of approximately €150 million. A provision for onerous contracts has been recorded in connection with this contract.

Other commitments and risks

Edison has signed two significant purchase contracts for gas from Azerbaijan (1 billion m³ per year), with deliveries scheduled to start in 2021, and LNG from the United States (1 million tonnes per year), with deliveries scheduled to start in 2023.

21.1.1.2 Operating contract performance commitments given

At 31 December 2020, these commitments mature as follows:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
Operating guarantees given	9,185	2,320	2,711	4,154	7,349
Operating purchase commitments [(1)]	7,720	4,359	2,732	629	7,594
Other operating commitments	246	92	87	67	305
OPERATING CONTRACT PERFORMANCE COMMITMENTS GIVEN [(2)]	**17,151**	**6,771**	**5,530**	**4,850**	**15,248**

(1) Excluding fuel and energy.

(2) Including commitments given by controlled entities to joint ventures, amounting to €1,714 million at 31 December 2020 (€1,019 million at 31 December 2019).

In the course of its business, the Group provides contract performance guarantees, generally through the intermediary of banks.

Operating guarantees given at 31 December 2020 mainly consist of guarantees given by EDF, Edison and EDF Renewables in connection with its development projects.

The change in these guarantees is essentially explained by new EDF Renewables projects in development (particularly in the United States) and by the higher parent company guarantee given by EDF covering the differential between the value of UK pension obligations under the Trustees' method and under IAS 19.

21.1.1.2.1 Operating guarantees given

Operating guarantees given are as follows:

(in millions of euros)	31/12/2020	31/12/2019
EDF	2,496	2,081
EDF Renouvelables	2,447	1,612
Edison	1,657	1,319
EDF Energy	1,055	912
Framatome	573	552
Other entities	957	873
TOTAL	**9,185**	**7,349**

21.1.1.2.2 Operating purchase commitments

Operating purchase commitments are as follows:

(in millions of euros)	31/12/2020	31/12/2019
EDF	3,524	3,028
Framatome	1,659	1,880
Enedis	845	829
EDF Energy	591	613
Other entities	1,101	1,244
TOTAL	**7,720**	**7,594**

21.1.1.3 Lease commitments as lessee

At 31 December 2020, lease commitments as lessee break down as follows:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
LEASE COMMITMENTS AS LESSEE	**369**	**54**	**181**	**134**	**489**

The only remaining off-balance sheet lease commitments are:

- leases that are exempt from recognition in application of IFRS 16. The total amount concerned at 31 December 2020 is €191 million (€211 million at 31 December 2019);
- leases of assets that have not yet been made available to the Group (principally real estate and LNG tankers under construction). The right-of-use assets and the lease liability will be recognised in the balance sheet when the leased asset is made available. The total amount concerned at 31 December 2020 is €178 million (€278 million at 31 December 2019).

21.1.2 Investment commitments given

At 31 December 2019, details of investment commitments are as follows:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
Commitments related to acquisition of tangible and intangible assets	15,625	8,650	6,459	516	17,430
Commitments related to acquisition of financial assets	716	95	523	98	583
Other commitments related to investments	153	143	10	-	224
TOTAL INVESTMENT COMMITMENTS GIVEN*	**16,494**	**8,888**	**6,992**	**614**	**18,237**

* *Including commitments given by controlled entities to joint ventures, amounting to €212 million at 31 December 2020 (€265 million at 31 December 2019).*

21.1.2.1 Commitments related to acquisition of tangible and intangible fixed assets

The commitments related to acquisition of tangible and intangible fixed assets are as follows:

(in millions of euros)	31/12/2020	31/12/2019
EDF	4,284	4,654
EDF Energy	5,966	6,466
Enedis	2,461	2,555
EDF Renouvelables	1,369	2,437
Framatome	462	517
Other entities	1,083	801
TOTAL	**15,625**	**17,430**

The decrease in commitments given related to acquisition of tangible and intangible fixed assets is mainly explained by progress on many projects developed by EDF Renewables in the United States and Brazil, and the lower commitments by EDF Energy, mainly due to the effect of the depreciation of the pound sterling against the euro. The decrease in Enedis' commitments is due to the continued rollout of Linky meters.

New contracts were signed by EDF PEI in 2020 in connection with the Larivot power plant project in Guyana (a renewable-energy plant using liquid biomass, developed as part of the multi-year energy plan).

21.1.2.2 Commitments related to acquisition of financial assets

The main share purchase commitments that cannot be valued concern Luminus.

Luminus signed an amendment to the shareholder pact on 26 October 2015 defining a liquidity clause for the investments held by its minority shareholders, which could, in certain conditions under the control of EDF, result in sale of their shares through an IPO, or purchase of their shares by the Group at market value. This liquidity clause is valid at all times from 1 July 2018 to 31 December 2025.

Regarding the investment in EDF Investissements Groupe (EIG), C3 (a fully-owned EDF subsidiary) and NBI (Natixis Belgique Investissement, a subsidiary of the Natixis group) amended the agreements for their investment in EIG on 19 December 2018.

C3 now has a call option to buy EIG shares held by NBI at a fixed price, exercisable at any time until May 2026. Meanwhile, NBI has a put option to sell EDF all of its EIG shares for a fixed amount of cash, exercisable subject to certain conditions between February 2024 and May 2025.

Due to their features, in compliance with IAS 32, NBI's put option and C3's call option are considered as derivatives and their net value is included in the positive or negative fair value of trading derivatives. At 31 December 2020, the fair value of these trading derivatives is not significant.

On 7 December Framatome signed a final purchase contract with Rolls Royce to acquire its Civil Nuclear Instrumentation and Control (I&C) activity. The transaction should be completed early in the second half of 2021, subject to customary conditions including regulatory approvals.

21.1.2.3 Other commitments related to investments

Other commitments given related to investments at 31 December 2020 mainly comprise guarantees given by EDF Norte Fluminense in connection with its 51% investment in CES, the company in charge of constructing and operating a hydroelectric dam on the Teles Pires river in Brazil.

21.1.3 Financing commitments given

Financing commitments given by the Group at 31 December 2020 comprise the following:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
Security interests in real property	4,179	90	2,246	1,843	4,587
Guarantees related to borrowings	949	51	495	403	1,314
Other financing commitments	408	364	6	38	442
TOTAL FINANCING COMMITMENTS GIVEN*	**5,536**	**505**	**2,747**	**2,284**	**6,343**

* *Including commitments given by controlled entities to joint ventures, amounting to €1,156 million at 31 December 2020 (€1,225 million at 31 December 2019). These financing commitments to joint ventures mainly concern EDF Renewables.*

Security interests and assets provided as guarantees mainly concern pledges or mortgages of tangible assets and shares representing investments in consolidated subsidiaries which own property, plant and equipment, for EDF Renewables.

21.2 Commitments received

The table below shows off-balance sheet commitments received by the Group that have been valued. Other commitments received are described separately in the detailed notes.

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Operating commitments received [1]	*21.2.1*	8,108	9,291
Investment commitments received	*21.2.2*	132	181
Financing commitments received	*21.2.3*	31	22
TOTAL COMMITMENTS RECEIVED [2]		**8,271**	**9,494**

(1) Excluding commitments related to supplies of energy and related services (see note 21.2.1.4).
(2) Excluding commitments related to credit lines, which are described in note 18.4.

21.2.1 Operating commitments received

Operating commitments received by the Group at 31 December 2020 comprise the following:

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
Operating lease commitments as lessor	711	114	355	242	770
Operating sale commitments	5,903	1,490	3,457	956	6,706
Operating guarantees received	1,444	1,195	161	88	1,756
Other operating commitments received	50	18	15	17	59
OPERATING COMMITMENTS RECEIVED	**8,108**	**2,817**	**3,988**	**1,303**	**9,291**

21.2.1.1 Operating lease commitments as lessor

In 2020, the Group benefits from commitments as lessor in operating leases amounting to €711 million.

These commitments mainly concern the Asian Independent Power Projects (IPPs) and real estate leases.

21.2.1.2 Operating sale commitments

Operating sale commitments received exclude energy deliveries and principally concern firm orders made through contracts recorded on a percentage-of-completion basis at Framatome (construction and engineering contracts) and EDF Renewables (agreements for operation services, maintenance services, and development and sale of structured assets).

21.2.1.3 Operating guarantees received

Operating guarantees received primarily concern EDF and relate to guarantees received from suppliers, particularly in connection with deliveries under the ARENH system.

21.2.1.4 Electricity supply commitments

In the course of its business, the EDF group has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5GW;
- in execution of France's Law on organisation of the French electricity market, EDF has a commitment to sell some of the energy generated by its existing nuclear power plants to other suppliers. This covers volumes of up to 150TWh each year until 31 December 2025.

21.2.2 Investment commitments received

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
INVESTMENT COMMITMENTS RECEIVED	**132**	**14**	**118**	**-**	**181**

21.2.3 Financing commitments received

	31/12/2020				31/12/2019
		Maturity			
(in millions of euros)	Total	< 1 year	1 to 5 years	> 5 years	Total
FINANCING COMMITMENTS RECEIVED	**31**	**2**	**19**	**10**	**22**

Note 22 Related parties

Accounting principles and methods

Related parties include the French State, companies in which the State holds majority ownership and certain of their subsidiaries, and companies in which the EDF group exercises joint control or significant influence. They also include members of the Group's management and governance bodies.

Details of transactions with related parties are as follows:

	Associates and joint ventures		Joint operations		French State or State-owned entities*		Group Total	
(in millions of euros)	31/12/2020	31/12/2019	31/12/2020	31/12/2019	31/12/2020	31/12/2019	31/12/2020	31/12/2019
Sales	355	455	-	-	2,082	1,889	2,437	2,344
Energy purchases	3,885	4,063	1	4	2,114	2,104	6,000	6,171
External purchases	13	18	7	3	348	253	368	274
Financial assets	179	150	-	-	-	-	179	150
Other assets	495	633	-	-	593	532	1,088	1,165
Financial liabilities	-	-	-	-	-	-	-	-
Other liabilities	1,114	1,228	1	1	600	624	1,715	1,853

* *Excluding tax and social liabilities and the CSPE receivable.*

22.1 Transactions with entities included in the scope of consolidation

Transactions with the principal associates (CTE (the company that owns RTE), CENG and Taishan) are presented in note 12.

Transactions with other associates, joint ventures, and partner entities in joint arrangements with the Group mainly consist of sales and purchases of energy.

22.2 Relations with the French State and State-owned entities

22.2.1 Relation with French State

The French State holds 83.68% of the capital of EDF at 31 December 2020, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, the EDF group is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (Cour des comptes) or Parliament, and verifications by the French General Finance Inspectorate (Inspection générale des finances).

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions assigned to EDF by the lawmaker for an unlimited period. The Law of 9 August 2004 does not stipulate the duration of the contract.

22.2.2 Relations with GRDF

Enedis and GRDF have an agreement that defines their relations for provision of certain common services and the resulting division of costs, under Article L. 111-71 of the French Energy Code.

In the gas and electricity distribution sector, this agreement covers work related to plant construction, site project management, and network operation and maintenance. It is updated regularly.

In 2018, Enedis and GRDF reorganised some of their joint operations by creating two mixed entities: one handles employment contracts, studies and medical/social matters and the other is the IT and telecoms operator for all telephone and office technology activities. These two entities took effect from 1 January 2019.

The support functions for Real Estate, Vehicles and Machines, Litigation and Insurance, Training and Recruitment, and Office purchases, which were previously combined, are now handled separately by each of the two companies.

In July 2020, Enedis and GRDF decided to initiate a shared project for transformation of their common activities (*transformation des activités communes* or TAC), with the aim of ending co-employability in the activities that remain mixed: equipment procurement and logistics, employment contracts, medical/social matters, housing management, IT and telecommunication for offices, and accounting.

Concerning the common service of LPG distribution and supply in the cities of Ajaccio and Bastia in Corsica, ENGIE informed EDF in October 2020 that it was considering terminating its LPG activities in Corsica on 31 March 2021 (its concession agreements ended in the 1990s). The same month, the city of Ajaccio launched a call for tenders for the LPG distribution concession and ENGIE submitted a bid. The city of Bastia also announced that it would launch a call for tenders. The 1951 agreement stipulates the terms for exchanges of information between EDF and ENGIE regarding the reciprocal impacts of their decisions.

22.2.3 Relations with public sector entities

The EDF group's relations with public sector entities mainly concern the two entities belonging to the former AREVA group (Orano and AREVA SA).

Transactions with Orano concern:

- the front-end of the nuclear fuel cycle (uranium supplies, conversion and enrichment services);
- the back-end of the nuclear fuel cycle (transportation, storage, processing and recycling services for spent fuel).

Front-end of the cycle

Several important agreements were negotiated between EDF and Orano:

- for supplies of natural uranium: Orano Mining contracts;
- for fluoration, enrichment of natural uranium into uranium 235: an Orano Conversion-Enrichissement contract (formerly Orano cycle contract).

In connection with the plan to construct two EPRs in the UK at the Hinkley Point site, on 29 September 2016 EDF and Orano signed a uranium contract with Orano Mining, and a conversion contract and an enrichment contract with Orano Conversion-Enrichissement.

Back-end of the cycle

Relations between EDF and Orano Recyclage concerning transportation, processing and recycling of spent fuels are described in note 15.1.1.1.

22.3 Management compensation

The Company's key management and governance personnel are the Chairman and CEO, the members of the COMEX (Executive Committee) throughout 2020 or since their date of appointment if they joined the COMEX during the year, and the directors. Directors representing the employees receive no remuneration for their services.

The total compensation paid by EDF and controlled companies to the Group's key management and governance personnel amounted to €11.9 million in 2020 (€12.6 million in 2019). This amount covered short-term benefits (basic salaries, performance-related salary, profit share and benefits in kind), special IEG post-employment benefits where relevant, and the corresponding employer contributions, plus any director's fees.

EDF's key management and governance personnel benefit from no special pension system, starting bonus or severance payment entitlement except by contractual negotiation.

Note 23 Subsequent events

No developments have occurred since the year-end in addition to those presented in other notes.

Note 24 Statutory Auditors' fees

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2020:

	Deloitte network		KPMG network	
(in thousands of euros)	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit – Statutory audit, certification, review of company and consolidated accounts				
EDF	2,794	24.6	2,945	16.2
Controlled entities [1]	4,560 [3]	40.1	13,503	74.2
Sub-total	**7,354**	**64.7**	**16,448**	**90.4**
Non-audit services [2]				
EDF	561	4.9	953	5.2
Controlled entities [1]	3,448	30.4	804	4.4
Sub-total	**4,009**	**35.3**	**1,757**	**9.6**
TOTAL	**11,363**	**100**	**18,205**	**100**

(1) Fully consolidated subsidiaries and jointly controlled entities whose auditors' fees are included in the consolidated income statement.

(2) Services required by laws and regulations, and services supplied at the request of the Group. Non-audit services mainly correspond to (i) certifications of financial and accounting information or Independent Reports on social, environmental and societal information required under Article L. 225-102-1 of the French Commercial Code, (ii) services relating to disposals of entities, (iii) tax services authorised by local legislation, and (iv) operating process reviews and information system consulting services that are unrelated to the production of accounting and financial information.

(3) The decrease results from a transfer between audit firms with no impact on the overall level of fees to the Group's auditors, and a change of Statutory Auditor for a significant French entity in the Group, which is now audited by the Group's Statutory Auditors and another audit firm.

Statutory Auditors' fees for 2019

The following table sets forth the fees paid for work done by the Statutory Auditors and their network during 2019:

	Deloitte network		KPMG network	
(in thousands of euros)	Amount (excluding taxes)	%	Amount (excluding taxes)	%
Audit – Statutory audit, certification, review of company and consolidated accounts				
EDF	2,709	19.2	2,822	17.1
Controlled entities [1]	8,104	57.4	11,654	70.6
Sub-total	**10,813**	**76.6**	**14,476**	**87.7**
Non-audit services [2]				
EDF	883	6.3	867	5.3
Controlled entities [1]	2,425	17.1	1,152	7.0
Sub-total	**3,308**	**23.4**	**2,020**	**12.3**
TOTAL	**14,121**	**100**	**16,496**	**100**

(1) Fully consolidated subsidiaries and jointly controlled entities whose auditors' fees are included in the consolidated income statement.

(2) Services required by laws and regulations, and services supplied at the request of the Group. Non-audit services mainly correspond to (i) certifications of financial and accounting information or Independent Reports on social, environmental and societal information required under Article L. 225-102-1 of the French Commercial Code, (ii) services relating to disposals of entities, (iii) tax services authorised by local legislation, and (iv) operating process reviews and information system consulting services that are unrelated to the production of accounting and financial information.

6.2 Statutory Auditors' report on the consolidated financial statements

This is a translation into English of the Statutory Auditors' report on the consolidated financial statements of the Company issued in French and it is provided solely for the convenience of English speaking users.

This Statutory Auditors' report includes information required by European regulation and French law, such as information about the appointment of the Statutory Auditors or verification of the information concerning the Group presented in the management report. This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

For the year ended 31 December 2020

To the Shareholders,

Opinion

In compliance with the engagement entrusted to us by your General Meeting, we have audited the accompanying consolidated financial statements of Électricité de France SA ("EDF", the "Company" or the "Group") for the year ended 31 December 2020.

In our opinion, the consolidated financial statements give a true and fair view of the assets and liabilities and of the financial position of the Group as at 31 December 2020 and of the results of its operations for the year then ended in accordance with International Financial Reporting Standards as adopted by the European Union.

The audit opinion expressed above is consistent with our report to the Audit Committee.

Basis for Opinion

Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described herein in the *Statutory Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report.

Independence

We conducted our audit engagement in compliance with independence requirements of the French Commercial Code (*Code de Commerce*) and the French Code of Ethics (*Code de déontologie*) for Statutory Auditors for the period from 1 January 2020 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in Article 5(1) of regulation (EU) no. 537/2014.

Justification of Assessments – Key Audit Matters

Due to the global crisis related to the Covid-19 pandemic, the financial statements of this period have been prepared and audited under specific conditions. Indeed, this crisis and the exceptional measures taken in the context of the state of sanitary emergency have had numerous consequences for companies, particularly on their operations and their financing, and have led to greater uncertainties on their future prospects. Those measures, such as travel restrictions and remote working, have also had an impact on the companies' internal organization and the performance of the audits.

It is in this complex and evolving context that, in accordance with the requirements of Articles L. 823-9 and R. 823-7 of the French Commercial Code (*Code de Commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the consolidated financial statements.

Valuation of provisions related to nuclear generation in France – back-end of the nuclear cycle, plant decommissioning and last cores – and dedicated assets

Notes 1.3.4.2, 15 and 18.1 to the consolidated financial statements

Key audit matter

As at 31 December 2020, the provisions recorded to cover obligations relating to nuclear power plants for which EDF is the operator in France total €44,822 million, including €24,622 million with respect to the back-end of the nuclear cycle (management of spent fuel and radioactive waste) and €20,200 million with respect to the decommissioning of nuclear power plants and last cores.

The valuation of these provisions depends on the regulatory context is described in Notes 1.3.4.2 and 15. It requires defining technical and financial assumptions and using complex calculation models.

They are updated and the assumptions taken into consideration in the models are reviewed at least once a year. As of 31 December 2020, the methodologies used to determine the discount rate changed, in connection with the change in 2020 in certain regulations regarding secure financing of nuclear expenses. These assumptions reflect management's best estimate at the reporting date of the impacts of the applicable regulation, the implementation of decommissioning and storage processes or changes in the main financial parameters.

Furthermore, the Company is required to allocate so-called "dedicated" assets to secure financing of certain categories of nuclear provisions in France. The realizable value of these assets should allow the Company's commitments relating to the decommissioning of nuclear power plants and long-term storage of radioactive waste in France to be covered (Notes 15.1.2 and 18.1). The realizable value of these dedicated assets, for an amount of €33,848 million (or a net carrying amount of €32,105 million) as of 31 December 2020, was determined based on the fair value of diversified equity and bonds investments, and the equity value of a non-listed assets portfolio managed by the division EDF Invest.

We considered the valuation of provisions related to nuclear generation and dedicated assets to be a key audit matter due to:

- the sensitivity of the assumptions on which the valuation of these provisions is based, notably in terms of cost, inflation and long-term discount rates, as well as the depreciation periods of nuclear power plants in operation, and forecast cash outflows; the modification of these parameters can lead to a material revision in the provisioned amounts;
- the negative impacts on the financial position of the Company (cash earmarked to increase the amount of dedicated assets) in the event of an increase in nuclear provisions in France, a change in the realisable values of dedicated assets or changes in the coverage rate of nuclear provisions for dedicated assets;

it being specified that the valuation of provisions covers and includes uncertainties related to the fact that certain scenarios and technical solutions have never been implemented.

Responses

We have analysed the measures for recognising provisions related to nuclear generation in France and gained an understanding of the industrial scenarios for decommissioning nuclear power plants and the technical solutions adopted in terms of management of spent fuel and radioactive waste. We have assessed the compliance of the methods for determining the provisions with regard to applicable accounting, legal and regulatory measures.

We have verified the calculation models used by the Company and assessed the assumptions adopted in terms of cost, forecast cash outflows and financial parameters (discount and inflation rates).

Our work also consisted in verifying the type of costs used to determine provisions and assessing the reconciliation of forecast costs and forecast cash outflows with industrial scenarios as well as the available studies and quotes.

We have also assessed the appropriateness of:

- margins for uncertainties and risks included in the provisions, to take into account the degree of control over decommissioning techniques and the management of spent fuel and radioactive waste;
- the series and mutualisation effects adopted in the quotes for decommissioning nuclear power plants in operation, for which the nominal cost represents €19,693 million to economic conditions at the end of the period, for a provision of €12,775 million in discounted value (note 15.1.1.5).

Concerning the inflation and discount rates and their calculation methods adopted by management described in note 15.1.1.5, we have verified their compliance with applicable accounting standards and regulatory measures, notably the ministerial decree and order of 1 July 2020. We have reconciled the data used for this purpose with available market data.

Concerning the securing of financing for certain of these provisions through dedicated assets, we have reconciled the realisable value of the dedicated assets in the portfolio at the reporting date with the available certificate of depository statements, and available external data and valuations. We have also assessed the accounting treatment and their valuation, in particular, the compliance with the IFRS 9 accounting standard of the impairment model described in the accounting principles and methods of the note 18.1.

Finally, we have verified the appropriateness of the disclosures given in the Notes for the provisions related to nuclear generation in France and the dedicated assets, notably regarding the sensitivity of the valuation of provisions to changes in macro-economic assumptions (note 15.1.1.5).

Valuation of goodwill, intangible assets with indefinite useful live, property, plants and equipments

Notes 1.3.4.1, 1.3.4.4 and 10 to the consolidated financial statements

Key Audit Matter

As at 31 December 2020, the goodwill, intangible assets with indefinite useful live and tangible assets represent significant amounts of the Group's equity.

Notes 1.3.4.4 and 10.8 describe the methodologies adopted and applied to determine if indicators exist showing that an asset may be subject to an impairment loss. These notes also describe the methods for performing impairment tests. The tests and the determination of recoverable amounts are carried out annually at the cash-generating unit (CGU) level for those holding intangible assets with indefinite lives or goodwill. The recoverable amount corresponds, for the majority of these CGU, to the value in use determined based on the discounted value of future cash flows.

We considered in particular the valuation of non-regulated assets in France, the United Kingdom and in Italy, to be a key audit matter, due to the sensitivity of valuations to macro-economic, industry and financial assumptions to determine recoverable amounts and the estimates and judgments that they require from management.

In particular, as indicated in note 10.8.2, a market environment in an unfavorable economic and sanitary crisis context with persistent low interest rates, a lowering demand for energy, in connection with energy efficiency policies and development of renewable energies, and lowering long-term fossil commodities and electricity prices in the main markets where EDF operates, may significantly decrease the recoverable amount of certain goodwill, intangible assets, property, plant and equipment and may lead to significant impairment losses.

Responses

As part of our work, we analysed the existence of indicators of impairment losses at the CGU level. We have also gained an understanding of the process for formulating estimates and assumptions made by management as part of impairment testing and we have also assessed the appropriateness of the valuation model.

We have verified, for the CGU tested, that the discounted future cash flow projections correspond to those generated by the assets included in these CGU and that they were consistent with (i) the budget data, medium-term plans (MTP) and, beyond, with the Group's long-term assumptions, (ii) past performances, (iii), market outlook and (iv) the expected operating life of the assets.

We have assessed, by conducting interviews with management, the different underlying assumptions (economic growth, price of raw material and CO2, electricity demands, production capacities and interconnections and changes in energetic mix) on which the medium and long-term price assumptions are based, by substantiating them with external studies carried out by international organisms or experts in energy.

We have verified the determination methods and the consistency of the discount rate assumptions, based on the weighted average cost of capital (WACC) by geographic area and by activity and, in particular, analysed, with the assistance of our internal experts, the consistency of risk-free rates and the risk premiums adopted by management with the underlying market assumptions.

We have assessed the highly probable aspect of the disposals decided by the Group and the items considered to evaluate the realizable value as describe in note 3.2 on the assets and liabilities held for sale.
Finally, we have assessed if notes 1.3.4.4 and 10.8 of the consolidated financial statements provide appropriate disclosure in particular in terms of assumptions adopted to perform impairment tests and sensitivity analyses.

Specific Verifications

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations of the Group's information given in the management report of the Board of Directors.

We have no matters to report as to its fair presentation and its consistency with the consolidated financial statements.

We attest that the consolidated non-financial statement required by Article L. 225-102-1 of the French Commercial Code is included in the information pertaining to the Group presented in the management report, being specified that, in accordance with the provisions of Article L. 823-10 of the Code, we have not verified the fair presentation and the consistency with the consolidated financial statements of the information contained therein and should be reported on by an independent insurance services provide.

Report on Other Legal and Regulatory Requirements

Format of presentation of the consolidated financial statements intended to be included in the annual financial report

We have also verified, in accordance with the professional standard applicable in France relating to the procedures performed by the Statutory Auditor relating to the annual and consolidated financial statements presented in the European single electronic format, that the presentation of the consolidated financial statements intended to be included in the annual financial report mentioned in Article L. 451-1-2, I of the French Monetary and Financial Code (*Code monétaire et financier*), prepared under the responsibility of the Chief Executive Officer, complies with the single electronic format defined in the european delegated regulation no. 2019/815 of 17 December 2018. As it relates to consolidated financial statements, our work includes verifying that the tagging of these consolidated financial statements complies with the format defined in the above delegated regulation.

Based on the work we have performed, we conclude that the presentation of the consolidated financial statements intended to be included in the annual financial report complies, in all material respects, with the European single electronic format.

We have no responsibility to verify that the consolidated financial statements that will ultimately be included by your company in the annual financial report filed with the AMF are in agreement with those on which we have performed our work.

Appointment of the Statutory Auditors

We were appointed as Statutory Auditors of Électricité de France SA by the General Meeting of 6 June 2005 for KPMG Audit and the by decision of the Board of Directors of 25 April 2002 for Deloitte & Associés.

As at 31 December 2020, KPMG Audit was in the 16th year of total uninterrupted engagement and Deloitte & Associés was in the 19th year of total uninterrupted engagement, which for both 16 years since securities of the Company were admitted to trading on a regulated market.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards as adopted by the European Union, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The consolidated financial statements were approved by the Board of Directors.

Statutory Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Objectives and audit approach

Our role is to issue a report on the consolidated financial statements. Our objective is to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As specified in Article L. 823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the Statutory Auditor exercises professional judgment throughout the audit and furthermore:

- identifies and assesses the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control;
- evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the consolidated financial statements;
- assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the Statutory Auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the consolidated financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein;
- evaluates the overall presentation of the consolidated financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation;
- obtains sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. The Statutory Auditor is responsible for the direction, supervision and performance of the audit of the consolidated financial statements and for the opinion expressed on these consolidated financial statements.

Report to the Audit Committee

We submit a report to the Audit Committee which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control regarding the accounting and financial reporting procedures that we have identified.

Our report to the Audit Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the consolidated financial statements of the current period and which are therefore the key audit matters, that we are required to describe in this report.

We also provide the Audit Committee with the declaration provided for in Article 6 of regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by Articles L. 822-10 to L. 822-14 of the French Commercial Code (*Code de commerce*) and in the French Code of Ethics (*Code de déontologie*) for Statutory Auditors. Where appropriate, we discuss with the Audit Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Paris La Défense, 17 February 2021

The Statutory Auditors

KPMG S.A.
Jay Nirsimloo Michel Piette

Deloitte & Associés
Damien Leurent Christophe Patrier

6.3 Financial statements

NB: Most figures in the tables are reported in millions of euros. The resulting approximation can lead to slight differences in totals or movements and changes.

Income statement

(in millions of euros)	*Notes*	2020		2019
Sales *	*4*	**44,315**		**46,155**
Change in inventories and capitalised production		1,360		1,447
Operating subsidies	*5*	8,148		7,670
Reversals of provisions and impairment	*6*	2,823		3,279
Other operating income and transfers of charges	*7*	846		849
I TOTAL OPERATING INCOME		**57,492**		**59,400**
Purchases and other external expenses	***8***	**36,213**		**38,090**
Fuel purchases used		3,269	3,498	
Energy purchases		16,783	18,232	
Services and other purchases used		16,161	16,360	
Taxes other than Income taxes	***9***	**2,694**		**2,674**
Personnel expenses	***10***	**6,439**		**6,453**
Depreciation, amortisation and provisions	***11***	**7,514**		**6,590**
Depreciation and amortisation	*11.1*	4,538	3,975	
Provisions and impairment	*11.2*	2,976	2,615	
Other operating expenses	***12***	**2,738**		**2,241**
II TOTAL OPERATING EXPENSES		**55,598**		**56,048**
OPERATING PROFIT (I - II)		**1,894**		**3,352**
III JOINT OPERATIONS				**-**
IV FINANCIAL RESULT	***13***	**(2,503)**		**(1,701)**
PROFIT OR LOSS BEFORE INCOME TAXES AND EXCEPTIONAL ITEMS (I - II + III + IV)		**(609)**		**1,651**
V EXCEPTIONAL RESULT	***14***	**425**		**547**
VI INCOME TAXES	***15***	**406**		**(605)**
PROFIT OR LOSS (I - II + III + IV + V + VI)		**222**		**1,593**

* *Production of goods for export in 2020: €8,428 million; production of services for export in 2019: €344 million.*

Balance sheet

ASSETS

(in millions of euros)	Notes	31/12/2020 Gross values	31/12/2020 Amortisation, depreciation and impairment	31/12/2020 Net values	31/12/2019 Net values
Intangible assets	*16-17*	**2,669**	**1,566**	**1,103**	**1,086**
Property, plant and equipment owned by EDF	*16-17*	**91,821**	**61,039**	**30,782**	**29,321**
Property, plant and equipment operated under concessions	*16-17*	**15,820**	**9,197**	**6,623**	**6,028**
Tangible and intangible assets in progress	*16-17*	**21,640**	**84**	**21,556**	**21,618**
Investments and related receivables		60,057	712	59,345	58,954
Investment securities		24,546	153	24,393	22,519
Loans and other financial assets		16,422	140	16,282	12,594
Financial assets	*18*	**101,025**	**1,005**	**100,020**	**94,067**
TOTAL I FIXED ASSETS		**232,975**	**72,891**	**160,084**	**152,120**
Inventories and work-in-progress	*19*	**10,842**	**301**	**10,541**	**9,786**
Advances on orders	*20*	**723**	**4**	**719**	**693**
Trade and other receivables	*20*	**22,588**	**475**	**22,113**	**20,944**
Marketable securities	*21*	**13,065**	**4**	**13,061**	**14,690**
Cash instruments	*20*	**1,814**	**-**	**1,814**	**2,672**
Cash and cash equivalents	*20-22*	**5,364**	**-**	**5,364**	**4,714**
Prepaid expenses	*20*	**987**	**-**	**987**	**1,087**
TOTAL II CURRENT ASSETS		**55,383**	**784**	**54,599**	**54,586**
Deferred charges (III)		**242**	**-**	**242**	**249**
Bond redemption premiums (IV)		**611**	**293**	**318**	**513**
Unrealised foreign exchange losses (V)	*23*	**872**	**-**	**872**	**1,305**
TOTAL ASSETS (I + II + III + IV + V)		**290,083**	**73,968**	**216,115**	**208,773**

EQUITY AND LIABILITIES

(in millions of euros)	*Notes*	31/12/2020	31/12/2019
Capital		**1,550**	**1,552**
Capital-related premiums		**16,506**	**16,506**
Revaluation surplus		**678**	**677**
Reserves			
Legal reserves		**155**	**151**
Other reserves		**2,977**	**3,000**
Retained earnings		**9,121**	**8,005**
Profit or loss for the financial year		**222**	**1,593**
Interim dividend		**-**	**(458)**
Investment subsidies		**160**	**159**
Tax-regulated provisions		**5,786**	**5,935**
EQUITY	***24***	**37,155**	**37,120**
Additional equity	***25***	**11,473**	**9,781**
Special concession accounts	***26***	**2,282**	**2,234**
TOTAL I EQUITY AND CONCESSION ACCOUNTS		**50,910**	**49,135**
Provisions for risks	***27***	**3,140**	**2,688**
Provisions related to nuclear generation (back-end of the nuclear cycle, plant decommissioning and last cores)	*28*	44,822	41,720
Provisions for decommissioning of non-nuclear facilities	*29*	772	667
Provisions for employee benefits	*30*	11,616	11,430
Provisions for other expenses	*31*	1,526	872
Provisions for expenses		**58,736**	**54,689**
TOTAL II PROVISIONS		**61,876**	**57,377**
Financial liabilities	***33***	**52,855**	**55,171**
Advances and progress payments received	***32***	**7,188**	**7,050**
Operating, investment and other liabilities	***32***	**34,673**	**32,322**
Cash instruments	***32***	**5,075**	**4,387**
Deferred income	***32***	**3,202**	**3,112**
TOTAL III LIABILITIES	***32***	**102,993**	**102,042**
Unrealised foreign exchange gains (IV)	***34***	**336**	**219**
TOTAL EQUITY AND LIABILITIES (I + II + III + IV)		**216,115**	**208,773**

Cash flow statement

(in millions of euros)		*Notes*	2020	2019
Operating activities				
Profit/(loss) before income tax			(184)	2,198
Amortisation, depreciation and provisions			8,071	5,393
Capital (gains)/losses			(524)	(181)
Financial income and expenses			(780)	(557)
Changes in working capital			719	1,012
Net cash flow from operations			**7,302**	**7,865**
Net financial expenses, including dividends received [1]			841	(787)
Income taxes paid			(776)	(452)
Net cash flow from operating activities	**(A)**		**7,367**	**6,626**
Investing activities				
Investments in property, plant and equipment and intangible assets			(5,848)	(6,365)
Proceeds from sale of property, plant and equipment and intangible assets			15	23
Changes in financial assets [2]			(4,424)	251
Net cash flow used in investing activities	**(B)**		**(10,257)**	**(6,091)**
Financing activities				
Issuance of green bonds convertible into new shares and/or exchangeable for existing shares (*Océanes vertes*) [3]		*2.4.1*	2,569	-
Issuance of borrowings and underwriting agreements [4]			9,928	5,109
Repayment of borrowings and underwriting agreements [4]			(11,815)	(3,522)
Dividends paid		*24*	-	(58)
Issuance and redemption of perpetual subordinated bonds, net of expenses		*2.4.2*	2,081	(636)
Funding contributions received for assets operated under concessions			7	5
Investment subsidies			9	4
Net cash flow from financing activities	**(C)**		**2,779**	**902**
Net increase/(decrease) in cash and cash equivalents	**(A)+(B)+(C)**		**(111)**	**1,437**
CASH AND CASH EQUIVALENTS – OPENING BALANCE [5]		**22**	**(80)**	**(1,564)**
Effect of currency fluctuations			(102)	15
Financial income on cash and cash equivalents			38	31
Other			(1)	1
CASH AND CASH EQUIVALENTS – CLOSING BALANCE [5]		**22**	**(256)**	**(80)**

(1) The variation in this item is principally explained by the higher level of dividends received in 2020 compared to 2019 (see note 13), and the foreign exchange result.

(2) These changes are principally explained by the increase in loans to subsidiaries (see note 18).

(3) €2,400 million nominal value (see note 2.4.1) and a €169 million issue premium.

(4) In 2020, EDF transferred bonds to several banks under repurchase agreements for the amount of €7,353 million and made corresponding repayments of €(6,532) million. These operations are presented in the lines reporting issuance and repayment of borrowings. Apart from these repurchase operations, the change in 2020 in "Issuance of borrowings and underwriting agreements" and "Repayment of borrowings and underwriting agreements" was a decrease of €(4,295) million, notably explained by bond issues in 2019 totalling €(3,015) million net of premiums which had no equivalent in 2020, and an increase of €(567) million in bond redemptions during 2020.

(5) "Cash and cash equivalents – opening balance" and "Cash and cash equivalents – closing balance" do not include investment funds or negotiable debt instruments maturing in more than three months. Details of the variation in cash and cash equivalents are presented in note 22.

Notes to the financial statements

Électricité de France SA (EDF), the parent company of the EDF group, is a French *société anonyme* governed by French law and registered in France (22-30 avenue de Wagram, 75008 Paris), operating in electricity generation and electricity and gas supply. EDF also covers all the business activities of the Island Energy Systems (SEI) for Corsica and France's overseas departments.

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Note 1 Accounting principles and methods

1.1 Accounting standards

EDF's financial statements are prepared in accordance with the accounting principles and methods defined in regulation 2014-03 of 5 June 2014 issued by the ANC (Autorité des normes comptables, France's Accounting Standards Authority) concerning the current national chart of accounts.

They also comply with the "Recommendations and observations for taking the consequences of the Covid-19 event into account in financial statements and positions established from 1 January 2020", published on 18 May 2020 by the ANC and updated on 3 and 24 July 2020 and 8 January 2021.

The accounting and valuation methods applied are identical to those used in the financial statements for the year ended 31 December 2019.

1.2 Managment judgments and estimates

The preparation of the financial statements requires the use of judgments, best estimates and assumptions in determining the value of assets and liabilities, income and expenses recorded for the period, considering positive and negative contingencies existing at year-end. The figures in EDF's future financial statements could differ significantly from current estimates due to changes in these assumptions or economic conditions.

In a context characterised by volatility on the financial and energy markets, the parameters used to prepare estimates are based on macro-economic assumptions appropriate to the very long-term cycle of EDF's assets.

The principal operations for which EDF uses estimates and judgments are the following:

1.2.1 Depreciation period of nuclear power plants

In the specific case of the depreciation period of its French nuclear power plants, EDF's industrial strategy is to continue operation beyond 40 years, in optimum conditions as regards safety and efficiency.

The depreciation period of 900MW series power plants was extended from 40 years to 50 years in 2016 (except for Fessenheim where both reactors were permanently shut down in the first half of 2020) since all the technical, economic and governance conditions were fulfilled. The depreciation period of other series (1,300MW and 1,450MW), which are more recent, is currently unchanged at 40 years.

These depreciation periods take into account the date of recoupling with the network after the most recent 10-year inspection.

The Tricastin plant's reactor 1 was reconnected to the grid on 23 December 2019 after the fourth 10-year inspection. This was the first 900MW series unit to pass the 40-year mark.

The fourth 10-year inspections of units 2 and 4 at Bugey began in 2020 (respectively early and late in the year), and the number of 10-year inspections to be conducted simultaneously in 2021 has increased to 5.

The decision by the French Nuclear Safety Authority ASN (Agence de sécurité nucléaire) setting the technical prescriptions applicable to 900MW series reactors, in view of the conclusions of the "generic" phase of the fourth periodic review, is expected to be issued by the end of February 2021.

Following the final adoption of France's multi-year energy programme (PPE) in April 2020 (see note 3.1), EDF's financial statements at 31 December 2020 include the impact of the two early reactor shutdowns to take place in 2027 and 2028 before they reach fifty years of operation. Depreciation plans have been accelerated from 1 July 2020, based on the various possible shutdown scenarios, as the decision regarding which reactors should be shut down does not have to be made yet. Nuclear provisions were re-estimated accordingly at 30 June 2020 (see note 28.3).

1.2.2 Nuclear provisions

The measurement of provisions for the back-end of the nuclear cycle, decommissioning and last cores is sensitive to assumptions concerning technical processes, costs, inflation rates, long-term discount rates, the depreciation period of plants currently in operation and disbursement schedules.

These parameters are therefore re-estimated at each closing date to ensure that the amounts accrued correspond to the best estimate of the costs eventually to be borne by EDF.

EDF considers that the assumptions used at 31 December 2020 are appropriate and justified. However, any future change in assumptions could have a significant impact on EDF's balance sheet and income statement (see note 28).

The main assumptions and sensitivity analyses relating to nuclear provisions are presented in note 28.5.

The calculation of provisions incorporates a level of risks and unknowns as appropriate to the operations concerned. The valuation of costs also carries uncertainty factors such as:

- changes in the regulations, particularly on safety, security and environmental protection, and financing of long-term nuclear expenses;
- changes in the regulatory decommissioning process and the time necessary for issuance of administrative authorisation;
- future methods for storing long-lived radioactive waste and provision of storage facilities by the French agency for radioactive waste management ANDRA (Agence nationale pour la gestion des déchets radioactifs);
- changes in the contractual terms for spent fuel management;
- changes in certain financial parameters such as discount rates or inflation rates;
- the depreciation period of nuclear facilities (calculation of decommissioning provisions for nuclear plants in operation is based on the depreciation period of the assets concerned, *i.e.* 50 years for 900MW series power plants and 40 years for 1,300MW series and N4 series power plants).

1.2.3 Pensions and other long-term and post-employment benefit obligations

The value of pensions and other long-term and post-employment benefit obligations is based on actuarial valuations that are sensitive to all the actuarial assumptions used, particularly concerning discount rates, inflation rates and wage increase rates.

The principal actuarial assumptions used to calculate these post-employment and long-term benefits at 31 December 2020 are presented in note 30.4. These assumptions are updated annually. EDF considers the actuarial assumptions used at 31 December 2020 appropriate and well-founded, but future changes in these assumptions could have a significant effect on the amount of the obligations and EDF's net income.

1.2.4 Energy supplied but not yet measured and billed

As explained in note 1.3, the quantities of energy supplied but not yet measured and billed are calculated at the reporting date based on consumption statistic models and selling price estimates. Determination of the unbilled portion of sales revenues at the year-end is sensitive to the assumptions used to prepare these statistics and estimates.

1.3 Sales

Sales essentially comprise income from energy sales (to final customers and as part of trading activities), and sales of services. EDF's energy sales revenues include delivery services through the energy distribution network purchased from the subsidiary Enedis and reinvoiced to end-customers.

Sales are recognised when delivery of goods has taken place or the service has been completed.

The quantities of energy delivered to EDF customers but not yet measured and billed at the end of the period are calculated based on the quantities used by the sites of the EDF balance-responsible entity less the quantities billed, after losses measured by a statistical method presented to the Commission de régulation de l'énergie (CRE), the French Energy Regulation Commission. These quantities are valued using an average price determined by reference to energy invoiced in the previous month.

Sales of goods and services not completed at the balance sheet date are valued by reference to the stage of completion at that date.

Sales of energy to EDF Trading, the EDF group's trading company, are recorded at their contractually stipulated amount.

1.3.1 Capacity mechanism

A capacity mechanism has been set up in France to ensure secure power supplies during peak periods.

French law 2010-1488 of 7 December 2010 on the new organisation of the electricity market introduced an obligation in France to contribute to power supply security from 1 January 2017.

Operators of electricity generation facilities and load-shedding operators must have their capacities certified by RTE, and commit to a forecast level of availability for a given year of delivery. In return, they are awarded capacity certificates. Meanwhile, electricity suppliers and purchasers of power to compensate for network losses (obligated actors) must have capacity certificates equivalent to consumption by their customers in peak periods. Suppliers pass on the cost of the capacity mechanism to final customers through their sale prices.

The system is completed by registers for trading of capacities between actors.

Capacity auctions are held several times a year.

EDF is concerned by both aspects of this system, as an operator of electricity plants and as an electricity supplier.

The operations are recorded as follows:

- sales of certificates are recognised in income when the auctions or over-the-counter sales take place;
- the cost of the capacity mechanism passed on to final customers through regulated sales tariffs and market-price offers is recognised in sales revenues as and when the electricity is delivered. In addition, the ARENH price, although it has not changed since first set up, is considered to have included a capacity value since 1 January 2017 when the capacity mechanism took effect, as the terms of transfer for the capacity guarantees associated with the ARENH system were defined by the CRE;
- stocks of certificates are stated either at their certification value (*i.e.* cost of certification by RTE) or at their purchase value on the markets;
- decreases in the stock of certificates are valued at the weighted average unit cost. The timing of recognition depends on the actor:
  - operators of installations: when the auction sales take place,
  - obligated actors: spread on a straight-line basis over the 5-month peak period;
- for obligated actors, if there is a shortfall in the stocks of capacity certificates, a provision is recorded equivalent to the best estimate of the expense necessary to extinguish the obligation;
- at the closing date, if the realisable value of the stock of capacity certificates is lower than its net book value, impairment is recognised.

1.4 Intangible assets

1.4.1 Research and development expenses

Research expenses are recognised as expenses in the financial period incurred.

Development costs that meet the requirements for capitalisation laid down in Article 211-5 of the French national chart of accounts are included in intangible assets and amortised on a straight-line basis over their foreseeable useful life.

1.4.2 Other intangible assets

Other intangible assets mainly consist of software and storage capacity reservation costs.

Royalties paid for SaaS (Software as a Service) are generally charged to expenses as the services are provided. To qualify as intangible assets, SaaS contracts must confer a right of control to the user in addition to access to the software for a fixed period.

Intangible assets other than research and development expenses are amortised on a straight-line basis over their useful lives regardless of whether they are generated in-house or purchased.

1.5 Property, plant and equipment

EDF's property, plant and equipment is reported under two balance sheet headings, as appropriate to the business and contractual circumstances of the assets' use:

- property, plant and equipment owned by EDF, essentially nuclear generation facilities;
- property, plant and equipment operated under concessions.

1.5.1 Initial measurement

Property, plant and equipment is recorded at acquisition or production cost:

- the cost of facilities developed in-house includes all labour and materials costs, and all other production costs attributable to the construction of the asset;
- the cost of property, plant and equipment also includes the initial estimate of decommissioning costs. These assets are associated with the provisions recorded to cover decommissioning obligations. At the date of commissioning, property, plant and equipment is measured and recorded in the same way as the corresponding provision (see note 1.15);
- decommissioning costs for nuclear generation installations also include last core costs (see note 1.15).

When some of the decommissioning costs for a plant are to be borne by a partner, the expected reimbursement is recognised as accrued income in the assets. The difference between the provision and the accrued income is recorded in Property, plant and equipment, and subsequent payments by the partner are deducted from the accrued income.

EDF capitalises safety expenses incurred as a result of legal and regulatory obligations sanctioning non-compliance by an administrative ban from operation.

Strategic safety spare parts for generation facilities are treated as property, plant and equipment, and depreciated over the residual useful life of the installations.

The costs of work done during major inspections that are necessary for continued operation by generation assets are capitalised and amortised over a period corresponding to the time elapsing between two inspections.

When a part of an asset has a different useful life from the overall asset's useful life, it is identified as an asset component and depreciated over a specific period.

Borrowing costs attributable to the financing of an asset incurred during the construction period are recognised as expenses.

1.5.2 Depreciation

Items of property, plant and equipment are depreciated on a straight-line basis over their useful life, defined as the period during which the Company expects to draw future economic benefits from their use.

The expected useful lives for the main facilities are as follows:

- hydroelectric dams 75 years:
- electromechanical equipment used in hydropower plants 50 years:
- fossil-fired power plants (mainly CCGT-Combined Cycle Gas Turbine plants) 25 to 45 years:
- nuclear generation facilities 40 to 50 years:
- distribution installations (lines, substations) 20 to 45 years.

1.5.3 Concession agreements

EDF is the operator for two types of concessions:

- public electricity distribution concessions in which the grantors are local authorities (municipalities or syndicated municipalities);
- hydropower concessions with the French State as grantor.

The accounting treatment of concessions is based on the 1975 accounting guide for concession operator firms, as there are no specific instructions in the national chart of accounts.

1.5.3.1 Public electricity distribution concessions

EDF is the concession operator for the island public distribution networks located in Corsica and France's overseas departments, under concession agreements based on standard concession specifications approved by the public authorities. Concession agreements signed since 2018 follow the concession model negotiated in 2017 with the National Federation of Licensing Authorities (Fédération nationale des collectivités concédantes et régies – FNCCR) and France Urbaine, while other concessions follow the concession model signed with the FNCCR in 1992 (and updated in 2007).

Concession assets are reported in the balance sheet assets as property, plant and equipment operated under concessions, regardless of their initial financing, at acquisition cost or their estimated value at the transfer date when supplied by the grantor. An offsetting liability is recognised for any assets supplied for nil consideration by concession grantors.

1.5.3.2 Hydropower concessions

Hydropower concessions follow standard rules approved by decree.

For concessions granted before 1999, hydropower concession assets consist solely of hydropower generation equipment (dams, pipes, turbines, etc.), while for more recent concessions, they also include hydropower generation equipment and switching facilities (alternators, etc.).

Assets used in these concessions are recorded under "Property, plant and equipment operated under concessions" at acquisition cost.

Depreciation is calculated over their useful life, which is generally identical to the term of the concession, although electromechanical equipment is depreciated over a period of 50 years.

Additional depreciation is also booked in the balance sheet liabilities for assets operated under concessions (see note 1.14.2).

Most concessions that expired before 2012 were initially for 75 years and were renewed for terms of 30 to 50 years. However, the French government has not yet renewed 18 concessions that have expired. Since their expiry these concessions have thus been in the "rolling extension" situation defined by the law. If, at the expiry date of a concession, no new concession has been established, "the concession is extended on the existing terms until such time as a new concession is granted", so as to ensure continuity of operations in the meantime (Article L. 521-16 par. 3 of the French Energy Code).

1.6 Long-term asset impairment

At each reporting date, EDF assesses whether there is an indication that an asset could have significantly lost value. If so, an impairment test is carried out as follows:

- EDF measures any long-term asset impairment by comparing the carrying value of these assets, combined into groups where necessary, and their recoverable amount, usually determined using the discounted future net cash flow method. When this recoverable amount is lower than the value in the balance sheet, an amount equivalent to the difference is written off under "Depreciation and impairment";
- the discount rates used for these purposes are based on the weighted average cost of capital (WACC) for each asset or group of assets concerned;
- future cash flows are calculated on the basis of the best available information at the valuation date;
  - for the first few years, the flows correspond to the Medium-Term Plan (MTP). Over the MTP horizon, energy and commodity prices are determined based on available forward prices, taking hedges into consideration,
  - beyond the MTP horizon, cash flows are estimated based on long-term assumptions prepared for each country and each energy, in a scenario development process that is updated annually. Medium and long-term electricity prices are constructed analytically by assembling blocks of assumptions, *e.g.* economic growth, commodity prices (oil, gas, coal) and CO_2, demand for electricity, interconnections, and developments in the energy mix (rise of renewable energies, installed nuclear capacity, etc.) with fundamental models of supply-demand balance. The Group refers in particular to external analyses for each assumption object (for example, for commodities and CO_2, which are primary factors in electricity prices, EDF compares its own scenarios with scenarios developed by organisations such as the AIE, IHS, Wood Mackenzie or Aurora, bearing in mind that each of these analysts itself proposes a cone of scenarios corresponding to different macro-economic environments),
  - income from capacity market mechanisms is also taken into consideration in valuing generation assets.

These calculations may be influenced by several variables:

- changes in discount rates;
- changes in market prices for energy and commodities and tariff regulations;
- changes in demand and EDF's market share, and the attrition rate on customer portfolios;
- the useful life of facilities, or the duration of concession agreements where relevant;
- the growth rates used beyond the medium-term plans and where relevant the terminal values taken into consideration.

1.7 Financial assets

1.7.1 Investments

Investments are carried at acquisition cost.

Gains and losses on sales of investments are valued using the FIFO (first in first out) method.

Transfer duties, fees and commissions and legal fees related to acquisitions of investments are included in the cost of acquisition of the asset.

Expenses of this type relating to other shares are included in expenses. Tax-regulated amortisation of acquisition costs is recorded in an excess depreciation account.

When the book value of investments is higher than their value in use, impairment is recorded equivalent to the difference.

The value in use of listed securities in non-consolidated entities is based on stock market price.

For unlisted and listed securities in companies included in the EDF group consolidation, the value in use is determined by reference to the transaction value, equity value or net adjusted consolidated assets, taking into account expert valuation data and information that has become known since the previous year-end when necessary.

1.7.2 Investment securities

EDF holds investment securities comprising financial assets intended to finance operations at the end of the nuclear cycle, for which provisions have been accrued. These assets are managed separately from other financial assets and investments in view of their specific objective, and consist of bonds, equities, collective investment funds and "reserved" funds

Other investments also include treasury shares that cover obligations relating to debt instruments providing access to the Company's capital, acquired under a liquidity contract with an investment services company or through an external growth operation or capital reduction.

Shares are recorded at acquisition cost. Transfer duties, professional fees, commissions, legal expenses and purchasing costs are all charged to expenses, applying the option used for other investments.

Investment securities (shares and bonds) are recorded at acquisition cost. If the carrying amount of a security is lower than the acquisition cost, the unrealised capital loss is fully covered by a provision without being netted against potential gains on other securities. The carrying amount of listed securities is assessed individually, taking the stock market price into account. For unlisted securities, the carrying amount is also assessed individually, mainly by reference to the growth prospects of the companies concerned and their share prices.

1.7.3 Other financial assets

EDF grants short-term loans in foreign currencies to its subsidiaries for the purposes of the Group's activities.

In order to reduce exposure to foreign exchange risks, EDF mainly finances these loans by short-term commercial paper issues in foreign currencies and in Euros, together with the use of currency hedging derivatives. Capitalised receivables are stated at nominal value. Impairment is recognised when the market value falls below the book value.

1.8 Inventories and work-in-progress

The initial cost of inventories includes all direct material costs (including the effect of hedging), labour costs and a share of indirect production costs.

Inventory consumption is generally valued under the weighted average unit cost method. Consumption of greenhouse gas emission rights and Energy Savings Certificates is valued under the FIFO (first in first out) method.

Inventories are carried at the lower of historical cost or net realisable value.

1.8.1 Nuclear fuel and materials

Inventory accounts include:

- nuclear materials, whatever their form during the fuel fabrication cycle;
- fuel components in the warehouse or in the reactor.

The stated value of nuclear fuel and materials and work-in-progress is determined based on direct processing costs including materials, labour and subcontracted services (*e.g.* fluoration, enrichment, fabrication, etc.).

In application of the concept of "loaded fuel" as defined in the ministerial order of 21 March 2007, the cost of inventories for fuel loaded in the reactors but not yet irradiated includes expenses for spent fuel management and long-term radioactive waste management. The corresponding amounts are taken into account in the relevant provisions.

Nuclear fuel consumption is determined by component (natural uranium, fluoration, enrichment, fuel assembly fabrication) as a proportion of the expected output when the fuel is loaded in the reactor. These quantities are valued at weighted average cost of inventories, applied to each component. Inventories are periodically corrected in view of forecast spent quantities based on neutronic measurements and physical inventories.

1.8.2 Other operating inventories

Other operating inventories include:

- fossil fuels required for operation of fossil-fired power plants;
- operating materials and equipment such as spare parts supplied under a maintenance programme (excluding capitalised strategic safety spare parts);
- greenhouse gas emission rights and Energy Savings Certificates acquired for the generation cycle (see notes 1.19.1 and 1.19.2);
- gas stocks, valued at weighted average cost, including direct and indirect purchase costs, especially transport costs;
- certificates issued under the capacity mechanisms (capacity guarantees in France) (see note 3.6).

Impairment of spare parts depends mainly on the turnover of these parts.

1.9 Accounts receivable and marketable securities

1.9.1 Trade receivables

Trade receivables are initially stated at nominal value.

They also include the value of unbilled receivables for energy already supplied.

A write-down is recorded when, based on the probability of recovery assessed according to the type of receivable, the recoverable amount of receivables falls below their book value. Depending on the nature of the receivable, the risk associated with doubtful receivables is assessed individually or by reference to provision matrices based on credit loss histories. EDF does not bear the risks of non-payment for the delivery portion of these receivables, which is borne by Enedis.

1.9.2 Marketable securities

Marketable securities are initially recorded as assets at acquisition cost, and restated at the lower of historical cost or present value at year-end.

For listed securities, the present value is equal to the year-end stock market price. For unlisted securities, the market value is the probable trading value taking the Company's growth prospects into consideration.

Provisions are recorded to fully cover any unrealised losses, without netting against unrecorded unrealised gains.

Gains and losses on sales of marketable securities are valued using the FIFO (first in first out) method.

1.10 Bond issuance expenses and redemption premiums

Bond redemption premiums and any issue premiums are amortised in equal portions prorated to the duration of the bond (straight-line method), regardless of the redemption pattern, applying the option allowed by Article 212-10 of the national chart of accounts.

For the specific case of the OCEANE bond issue (see note 2.4.1), EDF applied the "two separate operations" method for recognition of the issue premium, and the accrued interest method for amortisation, as allowed by the Article 212-10 of the national chart of accounts.

Commissions and external costs paid by EDF upon issuance of borrowings and included in "Deferred charges" are spread on a straight-line basis over the term of the related instruments.

1.11 Unrealised foreign exchange gains and losses

Foreign currency receivables and payables are translated into Euros at the year-end exchange rates. The resulting translation differences are recorded in the balance sheet under "Unrealised foreign exchange gains" and "Unrealised foreign exchange losses". Provisions are recorded to cover all unrealised exchange losses on foreign currency borrowings not hedged for exchange risks. Unrealised gains are not recognised in the income statement.

Unrealised gains and losses on currency derivatives classified as hedging instruments are recorded in the balance sheet in the revaluation surplus accounts, and netted with the unrealised foreign exchange gains and losses booked in respect of the hedged items, in compliance with ANC regulation 2015-05 of 2 July 2015 on forward financial instruments and hedging operations. Realised gains and losses on hedging derivatives are recognised in the income statement symmetrically to gains and losses on the hedged item.

Foreign exchange gains and losses on trade receivables and payables are recorded in operating income and expenses.

1.12 Tax-regulated provisions

This item mainly includes excess depreciation recorded for tax purposes and relates to:

- ordinary depreciation of generation and distribution facilities;
- exceptional depreciation of software developed in-house by the Company;
- amortisation of acquisition expenses for new investments by the Company.

1.13 Additional equity

Perpetual subordinated bonds issued by EDF in Euros and other currencies are recorded in compliance with the French Chartered accountants' body *Ordre des Experts Comptables* opinion 28 of July 1994, taking their specific characteristics into consideration.

As a result, they are classified as additional equity, since redemption is exclusively controlled by EDF.

Issuance expenses and issue premiums are amortised through the income statement, on a *pro rata* basis.

Interest paid on these bonds is recorded in the financial result.

1.14 Special concession liabilities

These liabilities relate mostly to public electricity distribution concessions for the Island Energy Systems (SEI), and hydropower concessions.

1.14.1 Special public electricity distribution concession liabilities – SEI

These liabilities represent the contractual obligations specific to the concession rules for public electricity distribution concessions in France, and comprise the following:

- the concession-granting authority's rights in existing assets (its right to recover all the concession assets), consisting of the value in kind of the facilities (the net book value of assets operated under concessions), less any as yet unamortised financing provided by the operator;
- the concession-granting authority's rights in assets to be replaced (the operator's obligations relating to assets due for replacement). These non-financial liabilities comprise:
  - depreciation recorded on the portion of assets considered to be financed by the concession-granting authority,
  - the provision for replacement, exclusively for assets due for replacement before the end of the concession. This is accrued over the asset's useful life, based on the difference between the asset's replacement value for identical capacity and functions, and the original value. The replacement value is adjusted at each year-end based on indexes from official publications, and the impact of the adjustment is spread over the residual useful life of the assets concerned. This provision is included in provisions for expenses.

When assets are replaced, amortisation recognised on the portion of assets considered to be financed by the concession-granting authority, and the provision for replacement established for the relevant asset, are cancelled and transferred to rights in existing assets. Any excess provision is taken to income.

During the concession, the grantor's rights in assets to be replaced are thus transferred upon the asset's replacement to become the grantor's rights in existing assets, with no outflow of cash to the benefit of the grantor.

1.14.2 Special hydropower concession liabilities

These liabilities comprise:

- the value of assets remitted for nil consideration and contributions received;
- differences arising from revaluations in accordance with French legislation for fixed assets commissioned before 1 January 1959 and before 1 January 1977;
- additional depreciation to industrial depreciation for facilities that are to be returned for nil consideration at the end of the concession but whose useful life extends beyond the concession term.

Following the changes made to the accounting treatment of hydropower concessions at 1 January 2009, the 1959 revaluation reserve is transferred to equity when the assets concerned are retired.

The net revaluation reserve generated by the 1976 revaluation is taken to income over the residual useful life of the assets concerned.

The value of assets remitted for nil consideration and contributions received is transferred to the income statement over the assets' useful lives.

1.15 Provisions other than employee benefit provisions

EDF recognises provisions when it has a present obligation (legal or constructive) arising from a past event, an outflow of resources will probably be required to settle the obligation, and the obligation amount can be estimated reliably.

If it is anticipated that all or part of the expenses covered by a provision will be reimbursed, the reimbursement is recognised under receivables if and only if EDF is virtually certain of receiving it.

Provisions are determined based on the Company's expectation of the cost necessary to settle the obligation. Estimates are based on management data from the information system, assumptions adopted by the Company, and if necessary experience of similar transactions or operations, or based on independent expert reports or contractor quotes. The various assumptions are reviewed for each closing of the accounts.

1.15.1 Provisions related to nuclear generation

Decommissioning provisions for power plants in operation are associated with fixed assets.

The discount effect generated at each closing to reflect the passage of time is recorded in financial expenses.

Changes in provisions resulting from a change in discount rates, a change in the disbursement schedule or a change in cost estimate are recorded:

- as an increase or decrease in the corresponding assets, up to the net book value, if the provision was initially covered by balance sheet assets;
- in the income statement in all other cases.

Provisions related to nuclear generation mainly cover the following:

- back-end nuclear cycle expenses: provisions for spent fuel management, for waste removal and conditioning and for long-term radioactive waste management are established in accordance with the obligations and final contributions specific to France;
- costs for decommissioning power plants;
- costs relating to fuel in the reactor when the reactor is shut down (provisions for last cores). These correspond to the cost of the fuel stock in the reactor that is not totally spent at the time of the final reactor shutdown and cannot be reused due to technical and regulatory constraints, the cost of processing for that fuel, and the cost of removal and storage of the resulting waste.

Obligations can vary noticeably depending on each country's legislation and regulations, and the technologies and industrial scenarios involved.

Detailed information on the principles for determining provisions related to nuclear generation is given in note 28.

1.15.2 Other provisions

These provisions mainly cover:

- losses relating to multi-year agreements for the purchase or sale of energy:
  - losses on energy purchase agreements are measured by comparing the acquisition cost under the contractual terms with the forecast market price,
  - losses on energy sale agreements are measured by comparing the estimated income under the contractual terms with the cost of the energy to be supplied,
  - losses on gas-related service agreements are measured by comparing the costs of fulfilling a contract with the resulting economic benefits, based on market and sales assumptions;
- losses on transportation, regasification, and gas storage contracts;
- unrealised foreign exchange losses;
- risks relating to subsidiaries and affiliates;
- tax risks;
- litigation;
- decommissioning costs for fossil-fired and hydropower plants;
- costs of replacing assets operated under public electricity distribution concessions;
- provisions related to environmental schemes (see note 1.19).

In extremely rare cases, description of a specific litigation covered by a provision may be omitted from the notes to the financial statements if such disclosure could cause serious prejudice to the Company.

1.16 Employee benefits

In accordance with the statutory regulations for companies in France's electricity and gas sector (IEG), EDF's employees are entitled to post-employment benefits (pension plans, retirement indemnities, etc.) and other long-term benefits (*e.g.* long-service awards).

1.16.1 Calculation and recognition of employee benefits

EDF recognises post-employment benefits granted to personnel as provisions.

Obligations under defined-benefit plans are calculated by the projected unit credit method, which determines the present value of entitlements earned by employees at year-end to post-employment benefits and long-term benefits, taking into consideration the prospects for wage increases and the country's specific economic conditions.

Post-employment benefit obligations are valued mainly using the following methods and assumptions:

- retirement age, determined on the basis of the applicable rules, and the requirements to qualify for a full pension;
- career-end salary levels, with reference to employee seniority, projected salary levels at the time of retirement based on the expected effects of career advancement, and estimated trends in pension levels;
- forecast numbers of pensioners, determined based on employee turnover rates and mortality data;
- reversion pensions where relevant, taking into account both the life expectancy of the employee and his/her spouse and the marriage rate for IEG sector employees;
- a discount rate that depends on the duration of the obligations, determined at the year-end date by reference to the market yield on high quality corporate bonds or the rate on government bonds whose duration is coherent with EDF's commitments to employees.

The amount of the provision takes into account the present value of the fund assets that cover these benefits, which is deducted from the benefit obligations.

Any actuarial gain or loss on post-employment benefit obligations in excess of 10% (the "corridor") of the obligations or fund assets, whichever is the highest, is recognised in the income statement progressively over the average residual working life of the Company's employees.

For other long-term benefits, actuarial gains and losses and the full past service cost are directly included in the provision, without application of the "corridor" rule.

The net expense booked during the year for employee benefit obligations includes:

- the current service cost, corresponding to additional benefit entitlements earned during the year;
- the net interest expense, corresponding to interest on obligations net of the return on fund assets;
- the income or expense corresponding to the actuarial gains and losses on long-term benefits and amortisation of actuarial gains or losses on post-employment benefits;
- the past service cost, including the income or expense related to amendments or settlements of benefit plans or introduction of new plans.

1.16.2 Post-employment benefit obligations

Since the financing reform for the IEG sector system took effect on 1 January 2005, the CNIEG (*Caisse Nationale des IEG*, the sector's specific pension body) has managed not only the special IEG pension system, but also the industrial accident, invalidity and death insurance system for the sector.

The CNIEG is a social security body governed by private law, formed by the Law of 9 August 2004. It has legal entity status and reports to the French government, operating under the joint supervision of France's Ministers for the Budget, Social Security and Energy.

Under the funding arrangements introduced by the Law, EDF establishes pension provisions to cover entitlements not funded by France's standard systems (CNAV, AGIRC-ARRCO), to which the IEG system is affiliated, or by the CTA (*Contribution Tarifaire d'Acheminement*) levy on gas and electricity transmission and distribution services.

As a result of this funding mechanism, any change (whether favourable or unfavourable to employees) in the standard French pension system that is not passed on to the IEG pension system is likely to cause a variation in the amount of the provisions recorded by EDF to cover its obligations.

The benefits covered by pension provisions include:

- specific benefits of employees in the deregulated or competitive activities;
- specific benefits earned by employees from 1 January 2005 for the regulated activities (island public electricity distribution) (benefits earned before that date are financed by the CTA levy).

CNIEG management expenses payable by EDF for the administration and payment of retired employees' pensions are also included.

In addition to pensions, other benefits are granted to IEG status former employees (not currently in active service), as detailed below:

- benefits in kind (energy): Article 28 of the IEG national statutes entitles such employees and current employees to benefits in kind in the form of supplies of electricity or gas at preferential prices. The obligation for supplies of energy to employees of EDF and Engie corresponds to the probable present value of kWh to be supplied to beneficiaries or their dependants during their retirement, valued on the basis of the unit cost. It also includes the payment made under the energy exchange agreement with Engie;
- retirement gratuities: these are paid upon retirement to employees due to receive the statutory old-age pension, or to their dependants if the employee dies before reaching retirement. These obligations are almost totally covered by an insurance policy;
- bereavement benefit: this is paid out upon the death of an inactive or disabled employee, in order to provide financial assistance for the expenses incurred at such a time (Article 26-§5 of the National Statutes). It is paid to the deceased's principal dependants (statutory indemnity equal to three months' pension, subject to a ceiling) or to a third party that has paid funeral costs (discretionary indemnity equal to the costs incurred);
- bonus pre-retirement paid leave: all employees eligible to benefit immediately from the statutory old-age pension and aged at least 55 at their retirement date are entitled to 18 days of bonus paid leave during the last twelve months of their employment;
- other benefits include help with the cost of studies, time banking for pre-retirement leave, and pensions for personnel sent on secondment to companies not covered by the IEG system.

1.16.3 Other long-term benefit obligations

These benefits concern employees currently in service, and include:

- annuities following incapacity, invalidity, industrial accident or work-related illness. Like their counterparts in the general national system, IEG employees are entitled to financial support in the event of industrial accident or work-related illness, and invalidity and incapacity annuities and benefits. The obligation is measured as the probable present value of future benefits payable to current beneficiaries, including any possible reversions;
- long-service awards;
- specific benefits for employees who have been in contact with asbestos.

1.17 Derivatives

EDF uses derivatives in order to minimise the impact of foreign exchange risks and interest rate risks.

These derivatives comprise interest rate and currency derivatives such as futures, forwards, swaps and options traded on the over-the-counter market.

The application at 1 January 2017 of ANC regulation 2015-05 concerning forward financial instruments and hedging operations led to recognition of unrealised gains on the foreign exchange optimisation portfolio, and the unrealised gain or loss on currency derivatives classified as hedging instruments, in the balance sheet, in the revaluation surplus accounts created by the regulation. These accounts are netted with the unrealised foreign exchange gains or losses booked in respect of the hedged items.

Hedging derivatives correct the foreign exchange result or interest income on the corresponding asset or liability. If the foreign exchange risk is fully hedged, no provision is recorded. If it is only partly hedged, a provision is recorded for the entire unhedged portion of the unrealised loss.

For other instruments, when there is no hedging relationship, a provision is recorded for unrealised losses and unrealised gains are not recognised.

Instruments in the portfolio at the year-end are included in off-balance sheet commitments at the nominal value of the contracts.

1.18 Commodity contracts

Forward financial instruments on commodities are traded for hedging purposes. Gains and losses on these operations are included in sales or in the cost of energy purchases, symmetrically to the hedged items, in accordance with ANC regulation 2015-05 concerning forward financial instruments and hedging operations, which has been applicable since 1 January 2017.

Instruments in the portfolio at the year-end are included in off-balance sheet commitments at the quantities to be delivered or to be received under the contracts.

1.19 Environment

1.19.1 Greenhouse gas emission rights

EU Directive 2003/87/EC set up a greenhouse gas emission quota trading system for the European Union.

This system was incorporated into national laws. Among other things it requires obligated actors, which is the case of EDF, to surrender to the State a number of greenhouse gas emission credits each year, corresponding to their emissions for the year. The rights and obligations associated with this system are periodically reviewed.

One of the main features of the third phase, running from 1 January 2013 to 31 December 2020, is the discontinuation of free allocation of emission rights in certain countries, including France.

EDF applies the accounting methods for greenhouse gas emission rights stipulated in ANC regulation 2012-03 of 4 October 2012, incorporated into Articles 615-1 to 615-22 of ANC regulation 2014-03.

The accounting treatment of emission rights depends on the holding intention. Two economic models coexist at EDF.

Emission rights held under the "Trading" model are included in inventories at acquisition cost. A write-down is recorded when the present value of emission rights is lower than the book value.

Emission rights held to comply with regulatory requirements on greenhouse gas emissions (the "Generation" model) are included in inventories at acquisition cost, and the FIFO (first in first out) method is applied. A write-down is recorded when the generation cost of the electricity that includes the cost of the rights is higher than the present value of that electricity. At year-end, a "net presentation" principle is applied as follows:

- an asset is recognised in raw materials inventories if the quantities of greenhouse gas emissions are lower than the number of emission rights held in the portfolio. This corresponds to the rights available to cover future greenhouse gas emissions;
- a tax liability is recorded in the opposite situation, equivalent to the rights still needed to cover emissions already produced, valued at contractualised acquisition price for forward purchases deliverable before surrender, and at market value for the balance.

The net reporting principle assumes that the emission rights held in the portfolio will be the rights used to offset emissions produced. However, there is a limit to the fungibility of rights at EDF, as there are no transfers of rights between the island and mainland activities. This can lead to concurrent recognition of an asset and a liability.

1.19.2 Energy savings certificates

In France, the Law of 13 July 2005 introduced a system of Energy Savings Certificates. Suppliers of energy (electricity, gas, heat, cold, domestic fuel oil and fuel for vehicles) with sales above a certain level became subject to energy savings obligations, initially for a three-year period.

To meet this obligation, three sources are available to EDF: supporting consumers in their energy efficiency operations, funding ministry-approved energy savings certificate schemes, and purchasing certificates from eligible actors.

EDF accounts for Energy Savings Certificates in compliance with Articles 616-1 to 616-25 of ANC regulation 2014-03 on the national chart of accounts.

EDF holds Energy Savings Certificates in order to meet the requirements of the regulations on energy savings. Consequently, EDF applies the "Energy Savings" model defined by the ANC regulation.

Certificates obtained or receivable are recorded in inventories at production or acquisition cost, and are valued under the FIFO (first in first out) method.

At the year-end, only the net position is presented in the financial statements:

- an asset is recognised (in work-in-progress and other inventories) if the energy savings achieved are greater than the energy savings obligations. This inventory corresponds to the certificates purchased, obtained or receivable that cover future energy savings obligations. It is consumed as and when energy sales are completed that generate energy savings obligations; or
- a liability (provision for other expenses) is recognised if the energy savings achieved are lower than the energy savings obligations. The liability corresponds to the cost of action yet to be taken to cover the obligations associated with energy sales completed. It is subsequently extinguished by making energy savings expenditures that enable the Company to obtain certificates, or by purchasing certificates.

Note 2 Significant events and transactions (including the effects of the Covid-19 pandemic)

2.1 Consequences of the Covid-19 pandemic

The economic disruption caused by the Covid-19 pandemic had significant repercussions for many of the EDF group's activities in 2020, particularly nuclear power generation, worksites and services.

On 14 April 2020 [(1)], the Group withdrew all its financial targets for 2020, including the lower threshold (€17.5 billion) for operating profit before depreciation and amortisation, and also for 2021. The Group was able to publish a new 2020 target for operating profit before depreciation and amortisation on 31 July 2020, setting a range of €15.2-15.7 billion. This was confirmed on 13 November 2020 when the third-quarter results were published, then revised upwards on 16 December 2020 to €16 billion or slightly more, given the greater clarity in the second half of the year regarding higher nuclear power output in the crisis context.

Nuclear power generation

As announced in the press release of 16 April 2020 [(2)], due to the Covid-19 crisis EDF had to make adjustments to all its activities in order to protect personnel working at its nuclear power plants. Work on the industrial maintenance programme, particularly scheduled operations during maintenance outages, was significantly affected, with a resulting reduction in the electricity generation capacity. EDF thus had to adjust its schedule of reactor outages for maintenance so as to contribute alongside the transmission operator RTE to ensuring a secure power supply throughout the winter of 2020-2021. Some reactors were consequently taken offline in order to save their fuel.

In addition, the economic slowdown during France's lockdown led to a decline of up to 20% in electricity consumption compared to normal levels [(3)], resulting in lower use of power plants.

Due to measures taken as a result of the Covid-19 pandemic (social distancing, organisation of employee movements, limits on the number of workers on site), work took longer to complete. Consequently, nuclear reactor outages lasted longer under the twin constraints of lower employee availability and lower productivity. The industrial maintenance programme was therefore revised to adjust scheduled work to industrial capacities, and match the number of reactors in operation to requirements of the network, particularly for the winter period of 2020-2021.

This crisis also led EDF to amend the schedule for reactor outages in future years. Reactor outages depend on complex optimisation in a field subject to many constraints, such as fuel management, compliance with regulatory requirements and scheduling work to match industrial capacities, while always ensuring a balance between supply and demand for electricity, especially in the winter period. As reactor outages are scheduled several years in advance by reference to forecast network requirements and industrial resources, deferring outages from one year to the next has a knock-on effect on the maintenance programme in subsequent years and therefore on the expected power output.

EDF's press release of 16 April 2020 consequently stated a revised estimate of annual nuclear power output in France: approximately 300TWh in 2020 (compared to between 375TWh and 390TWh as communicated on 14 February 2020), reflecting the consequences of the Covid-19 pandemic and other factors affecting availability of the nuclear fleet, and between 330TWh and 360TWh each year in 2021 and 2022.

On 2 July 2020 [(4)] the EDF group then announced an upward revision to this estimate of annual nuclear power output in France in 2020, to approximately 315-325TWh.

(1) See the press release of 14 April 2020: Update on the consequences of the Covid-19 sanitary crisis.
(2) See the press release of 16 April 2020: EDF revises its annual nuclear output forecast.
(3) See rte-france.fr – L'impact de la crise sanitaire (Covid-19) sur le fonctionnement du système électrique (5 April 2020, in French only).
(4) See the press release of 2 July 2020: EDF revises upwards its annual nuclear output estimate for 2020.

These revisions were undertaken because work resumed earlier than had been expected when the 16 April estimate was published. The duration of scheduled outages in 2020 was adjusted in view of the observed on-site conditions for the return to work. EDF was able to complete several outages of the 2020 programme during the first half of the year, and continue work on reactors still in operation, while respecting the required measures to prevent the spread of the virus, by optimising movements into and out of restricted-access areas through adjustments to the organisation of work so as to limit the number of people working on the same activity, or using work-from-home arrangements. As a result of the Covid-19 pandemic, the second half of the year began with more reactors on scheduled outages for maintenance than initially planned.

Thanks to better performances than expected on maintenance outages during the second half of the 2020, it was possible to re-estimate nuclear power output for the year at 325-335TWh on 13 November, then announce that it would be close to 335TWh on 16 December 2020. In the end nuclear output for 2020 stood at 335.4TWh, 44.1TWh lower than in 2019 due to the direct and indirect effects of the Covid-19 pandemic totalling 32.9TWh (modulation in response to demand and the timing of outages; constraints associated with measures to prevent the spread of the virus, affecting work during outages). As well as the impacts of the pandemic, the decrease in nuclear power output compared to 2019 is mainly attributable to the shutdown of the two Fessenheim reactors, and prolongation of three complex outages.

Support for customers and suppliers

As set out in the press release of 16 April 2020 [(1)], EDF introduced specific measures to support its customers in the context of the Covid-19 pandemic.

During France's first official public health emergency period, from 24 March to 10 July, EDF decided to guarantee the power supply for all residential customers by suspending all reductions and cut-offs of electricity and gas supplies, and all late payment penalties, until 1 September 2020, and to support customers in difficulty by offering more flexible payment terms and deadlines. The Company thus took steps that went further in both scope and duration than the measures introduced by the French government (such as extending the period when tenant evictions and customer power cut-offs are banned, which normally covers the winter months, to 10 July 2020).

For business customers, EDF took all the necessary measures to grant payment deferrals requested by customers eligible for the national Solidarity Fund, in compliance with the ordinances and decrees adopted by the government. The small businesses concerned were entitled to request deferred payment of invoices falling due until the end of France's first public health emergency period (10 July 2020). The deferred amounts were spread over a 6-month period from the last day of the month following that date.

The French government then declared a second public health emergency period from 17 October 2020, initially until February 2021 but later extended to 1 June 2021. For residential customers, EDF took further measures in addition to the standard winter ban on evictions and power cut-offs that begins in France on 1 November: to protect customers in difficulty, EDF decided to suspend all power reductions until 15 January 2021, not to apply late payment penalties to invoices issued during the period, and to allow customers extended payment deadlines. The higher risk of non-recovery associated with these measures is incorporated into calculation of the provisions for customer receivables at 31 December 2020 (see note 2.1.2). For business customers, EDF was prepared to allow deferred payment on invoices as required by the French law of October 2020 on the Covid-19 emergency as soon as its application decree defining the scope of customers concerned was published. As that decree has not yet been published, debt collection on the business customer segment remained in line with normal laws and no specific measure has been applied by EDF.

In addition, as explained in the press release of 2 April 2020[(2)], to support its very small, small and medium-sized suppliers in the economic slowdown caused by the pandemic, the EDF group decided to settle its suppliers' invoices sooner than the contractual 60-day period in France. This initially applied to completed services that had been validated by EDF at 31 March 2020: EDF SA paid its very small suppliers by mid-April and its small and medium-sized suppliers by the end of April, with no intervention required of the supplier. Enedis also took equivalent measures. The first wave of faster payments concerned more than twenty thousand invoices amounting to a total of around €190 million for the entire Group in France. The practice was then progressively extended until the end of the first half-year, in line with the first emergency period which ended on 10 July 2020. In the period from April to June 2020, EDF thus settled nearly €261 million of invoices before the contractual deadline for very small, small and medium-sized suppliers in France. These measures taken in the first half-year have no impact on EDF's working capital at 31 December 2020.

Estimated impacts of the Covid-19 pandemic on the income statement for 2020

In accordance with AMF (French market regulator) and ANC recommendations, EDF has not applied any different classifications as a result of Covid-19 from those normally used in its income statement. In-depth analyses were conducted in EDF's local entities and centrally for the half-year closing at 30 June 2020, then the annual closing at 31 December 2020, to prepare reliable estimates of the impacts of the pandemic on EDF's financial statements. The main estimated impacts of the Covid-19 pandemic on items of EDF's income statement are presented below.

The pandemic's impact on **sales** at 31 December 2020 is estimated at a negative €1,117 million (or around -2.5% of total sales), reflecting the lower nuclear power output and a decline in demand for electricity which led to sales on the wholesale markets at lower prices.

The estimated impact of the Covid-19 pandemic on the CSPE (recognised in **operating subsidies**) is a €37 million decrease, explained by the lower surplus costs for energy purchases and generation due to lower demand for electricity in the island territories (non-interconnected zones).

The impact of the Covid-19 pandemic on **fuel and energy purchases** at 31 December 2020, due to the decline it caused in nuclear power output and demand for electricity and gas, is an estimated decrease of approximately €203 million.

The pandemic also had an estimated downward impact of €260 million on **services and other purchases used**, reflecting several types of effect:

- a decrease of €105 million in delivery expenses, in line with the decline in demand for electricity;
- slowdowns or deferrals of on-site work in the Group's various businesses led to lower non-capitalisable purchases;
- additional expenses incurred in connection with the Covid-19 pandemic (protective equipment, hand sanitiser, etc.);
- lower purchases as a result of the lockdown and various measures introduced by the public authorities, for example restrictions on movement and requiring people to work from home (less travel, training and seminars, etc.).

Personnel expenses increased by some €68 million, principally in connection with the business recovery plan introduced by the Company. This amount includes the unfavourable effect of the pandemic in terms of charges for employee holiday pay.

Finally, **provisions and impairment net of reversals** were adversely affected to the extent of some €118 million, including €85 million following revaluation of impairment of trade receivables and €45 million due to an increase in decommissioning provisions for permanently shut-down nuclear power plants where decommissioning work had to be postponed.

The above estimated impacts were prepared from specific reporting set up by EDF as part of the closing for the financial statements, applying the following approaches:

- effects associated with downturns in business levels or deferrals of site work are based on detailed comparative analyses with the corresponding period of 2019, or infra-annual forecasts; impacts on sales due to lower demand for electricity and gas are based on analyses founded on consumption forecast models that take account of other effects (weather effects, portfolio changes, etc.); impacts on nuclear power output are based on analyses of generation by plants in operation (particularly for modulation) and detailed analyses of outages for units that had a scheduled outage in 2020 after the pandemic crisis began, whether for fuel reloading or for regular maintenance, by comparison of activities and time spent on outages in the crisis context in 2020 with a model of outages and the actual work completed in 2019;

(1) See the press release of 16 April 2020: Crise sanitaire: EDF s'engage sur des mesures inédites pour aider tous ses clients (in French only).

(2) See the press release of 2 April 2020: The EDF group united in its determination to tackle the public-health crisis.

- the estimates calculated aim to assess the financial impacts of the Covid-19 pandemic regarding the downturn in business activity, and volumes sold and produced. These estimates do not include impacts of crisis-correlated price effects such as observed market prices over the period, due to the difficulty of attributing them directly and solely to the pandemic. Furthermore, these impacts do not include the effects of action plans implemented by the Group in response to the pandemic;
- additional expenses incurred in connection with the public health crisis (protective equipment, hand sanitiser, etc.), and assessment of the specific measures or risks associated with the crisis, are based on figures recorded in the accounting information system.

The resulting estimated impact of the Covid-19 pandemic on operating profit at 31 December 2020 is some €(862) million (at 30 June it was some €(472) million).

Some estimates reflecting the information known to EDF at 31 December 2020, notably concerning the risk of non-recovery of customer receivables, are uncertain by nature. The final situation could differ from the year-end estimates, depending on how the crisis ends, and more broadly the economic conditions in 2021.

Finally, it should be noted that the financial result was significantly impacted by the decline on the financial markets in the first half-year of 2020 (see note 8 to the condensed half-year financial statements). The behaviour of the financial markets in the second half-year, combined with EDF's strategic choices, particularly for management of its dedicated asset portfolio, limited the impact on EDF's financial result and exceptional result at 31 December 2020 (see notes 13 and 14).

2.1.1 Liquidity risk

As reported in the condensed half-year financial statements, at 30 June 2020 EDF had a strong liquidity position including €12 billion of marketable securities and €13.6 billion of cash and cash equivalents, including securities transferred under repurchase agreements in the context of the Covid-19 pandemic, which amounted to €6.5 billion in the first half of 2020 (see note 13 to the condensed half-year financial statements), and unused credit lines with banks amounting to €10.1 billion.

At 31 December 2020 EDF had a strong liquidity position including €12.8 billion of marketable securities and €5.4 billion of cash and cash equivalents, including cash received net of repayments already made to several banks for bonds transferred under repurchase agreements in the context of the Covid-19 pandemic, amounting to €0.8 billion (see note 20 (4)), and unused credit lines with banks amounting to €10.5 billion (see note 36).

2.1.2 Sales and trade receivables

Impairment of trade receivables

EDF calculates impairment of trade receivables by reference to provision matrices based on credit loss histories.

Despite the support measures introduced by national governments, and the support measures put in place by EDF for its customers, the Covid-19 pandemic should result in an increase in the amount of non-recoverable receivables which was not yet very visible at 31 December 2020. The risk analyses conducted have led to a €85 million increase to impairment of trade receivables resulting from the pandemic, recognised in provisions and impairment in the income statement.

This increase in impairment results primarily from the fact that the provision matrices habitually used are applied to a broader base of receivables in the portfolio reflecting longer payment times as a result of the pandemic, particularly in the Business customer segment in France. It is also explained by adjustments made to the provision matrices *via* post-model corrections to take account of the specific situation brought about by the Covid-19 pandemic which was not reflected in the existing models. To determine these corrections, differentiated approaches were introduced for each customer type (residential customers and business customers by industry sector).

In the Residential customer segment, the increase in the credit risk remains moderate at this stage (as most customers in the portfolio pay by direct debit and so far no increase in debit rejections has been observed; also, support measures for customers in difficulty have been introduced). Nevertheless, corrections were applied, by increasing the provision rate for all doubtful trade receivables arising since the start of the pandemic that are considered at greater risk of becoming non-recoverable than the receivables less than 12 months old from previous years used to construct the existing provision matrices, and by increasing the provision rate for current receivables, notably based on an INSEE (French statistical office) study of October 2020 of the economic consequences of lockdown on household finances, taking account of prospects of a rise in France's unemployment rate following the Covid-19 pandemic. In the Business customer segment, at the top end of the portfolio (large customers), case-by-case monitoring referring to external credit ratings did not indicate any material increase in the credit risk. At the bottom end and middle of the portfolio (small and medium-sized businesses, very small businesses), provision matrices were corrected for the business sectors in this portfolio deemed to entail the highest risk, in order to reflect a probable increase in the default rate (based, among other things, on external macroeconomic forecasts, for example publications by credit insurance companies such as Coface or Euler Hermes). The data available at the year-end instead suggest that the level of default observed by businesses is in fact lower in 2020 than the previous year; this is attributed to a "delay effect". The forecast default rates used at the year-end therefore incorporate the likelihood of an increase in bad debt in 2021.

Assignment of trade receivables

Some group entities make use of non-recourse assignment programmes for trade receivables. The assignees in the programme have not tried to renegotiate any contractual clauses that would affect the non-recourse nature of their contracts.

ARENH dispute – *Force majeure*

The Covid-19 pandemic and the emergency measures introduced by France's public authorities from 17 March 2020 led to a decline in electricity consumption by non-residential clients that affected all market players, including EDF.

Faced with this decline in electricity consumption, some suppliers wanted to reconsider their contractual commitments, citing force majeure to reduce the volumes they had purchased from EDF in November 2019 under the ARENH mechanism.

Confirming the French Energy Regulation Committee's (CRE's) decision of 26 March, on 17 April the French Council of State rejected an appeal filed by two energy supplier associations, considering that it was not proven that the losses incurred by the energy suppliers concerned were "such that they would jeopardise (...) the survival of the businesses over a horizon of a few months" and that "these losses would have such an impact during the timeframe required by the competent judge to make a ruling on the claims".

On 20, 26 and 27 May 2020, after summary proceedings the Paris Commercial Court ruled that the introduction of emergency measures by the French government constituted a force majeure event for the ARENH contracts with Alpiq, Gazel and Total Direct Energie, entailing suspension of those contracts. On 28 July 2020, the Paris Court of Appeal upheld the urgent application judge's decision. EDF filed an appeal against this ruling on 28 July 2020. Total Direct Energie is the only remaining party in the ongoing proceedings.

On 2 June 2020 [(1)], EDF notified the energy suppliers Alpiq, Gazel and Total Direct Énergie of the termination of their ARENH contracts, as allowed when these contracts are suspended for more than two months. This decision was made as a precautionary measure to protect EDF's rights.

A challenge to this termination was taken before the urgent applications judge, who issued a ruling concerning Total Direct Energie on 1 July 2020 that temporarily suspended the effects of EDF's contract termination letter. On 19 November 2020 the Paris Court of Appeal overturned that ruling and restored the effects of the termination notified by EDF on 2 June 2020.

(1) See the press release of 2 June 2020: EDF has notified three energy suppliers of the termination of their Arenh contracts.

In the meantime, these three energy suppliers notified EDF of the end of the *force majeure* event in mid-June, and ARENH deliveries resumed. As the CRE did not allow EDF's request to suspend ARENH deliveries to Total Direct Energie for the end of the year, in application of the Paris Court of Appeal decision of 19 November, on 10 December 2020 EDF brought a claim before the Council of State for abuse of power, requesting cancellation of the CRE's decision.

The suspension of deliveries to these three suppliers for approximately 15 days (from the ruling by the Paris commercial court in summary proceedings, to the notification of the end of *force majeure* by the suppliers), and the continuation of deliveries to Total Direct Energie, represent some tens of millions of euros in lost income for EDF at 31 December 2020 (due to the price effect of volumes being sold at market prices instead of ARENH prices during that period).

Further summary proceedings were initiated in late September 2020 by Ohm Energie, seeking a suspension of payments due for ARENH volumes, claiming that deliveries had been continued illegally by EDF since it had requested suspension of ARENH deliveries from April to June 2020 due to *force majeure*. On 23 October 2020 the Paris Commercial Court rejected all of Ohm Energie's claims.

In parallel to the above summary proceedings, cases concerning the substance of the matter were brought before the Paris Commercial Court by several ARENH applicants, claiming compensation from EDF for the prejudice caused by its allegedly illegal refusal to apply the force majeure clause. These cases are ongoing.

2.1.3 Property, plant and equipment

Gross investments in property, plant and equipment and intangible assets amounted to €5,848 million in 2020 (see the cash flow statement) compared to €6,365 in 2019, a decrease of €517 million. These amounts include capitalised production costs totalling €1,243 million in 2020 and €1,329 million in 2019.

The Covid-19 pandemic had a moderate overall impact for EDF on gross investments in property, plant and equipment and intangible assets compared to 2019.

With the introduction of national lockdowns and practices to prevent the virus spreading, some work projects were suspended and deferred, while others continued but at a much slower pace. Resumption of work varied in speed and intensity in the second half of the year, depending on the activities concerned. Some work, much of it engineering work, could be done remotely.

The new public health measures themselves have generated additional costs, principally resulting from additional protective activities, tension on external resources in some fields of work, and longer completion times for certain operations (due to adoption of practices to stop the virus spreading, limits on the number of workers on site, etc.). The additional costs directly attributable to continuation of site work and completion of assets have been capitalised. No significant effect resulting from below-normal production activity that might have been capitalised was identified at 31 December 2020. The costs of demobilising and remobilising personnel for the deferred and suspended worksites are recorded as expenses.

Most of the €517 million decrease in gross investments between 2019 and 2020 was unrelated to Covid-19 effects, which were as follows:

- some scheduled reactor outages at nuclear plants in operation were deferred, while the duration of outages was extended, entailing higher costs. On 29 October 2020, EDF announced an adjusted cost for the *Grand Carénage* programme to 2025. The new cost estimate mainly reflects the first findings on the work to be conducted for the fourth ten-year inspections of the Group's 900MW reactors, and the revised duration of scheduled maintenance outages based on experience from previous years and the impacts of the Covid-19 pandemic for the period 2020-2022;
- work on hydropower projects was suspended, apart from required safety and security work (or completion of essential work), from 17 March 2020 and resumed from mid-April, and the pace of work was practically back to normal by the end of May;
- the majority of nuclear engineering work could be done remotely;
- after a Covid-19 outbreak was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only. On-site work for the Flamanville 3 project resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020; based on work in the second half-year, the Covid-19 pandemic ultimately had a non-significant impact on 2020 investments in Flamanville 3 compared to 2019, given that the exceptional additional costs of repair work on the main secondary circuit welds were recorded as operating expenses (see note 8 and note 10).

2.1.4 Provisions

Capacity mechanism – imbalance settlement payments

In view of the significant downward revision during the first half-year of estimates of nuclear power output in France for 2020, and the results of the capacity auction held on 25 June 2020, EDF considered in its half-year financial statements that it was likely to be required to make imbalance settlement payments for the delivery year 2020, and recorded a provision of €137 million for this purpose at 30 June 2020 (see notes 1.3.1 and 3.6 for details of the operation of France's capacity mechanism). In view of the final nuclear power output achieved in 2020, and particularly the availability of EDF's generation plants during the peak periods of the second half of the year, this provision was cancelled in the second half-year since EDF had fulfilled its obligations relating to the French capacity mechanism.

Provisions for onerous contracts

EDF has updated its provisions for onerous contracts (mainly gas purchase contracts and some customer contracts), principally to reflect changes in market price scenarios (see note 27). No new significant onerous contracts were identified.

Decommissioning provisions for permanently shut-down nuclear power plants

Ongoing work on decommissioning was halted from 16 March 2020. On the sites concerned, only the regulatory activities (monitoring the environment, site safety and security) continued. Work first resumed on 11 May 2020.

The temporary deferral of certain types of on-site decommissioning work led to a €45 million increase to provisions for decommissioning concerning nuclear plants currently being dismantled at 31 December 2020.

2.1.5 Other assets, liabilities, income and expenses

In addition to the information in the previous paragraphs, the Covid-19 pandemic did not involve any other specific use of judgments, estimates or assumptions for determination of the value of assets and liabilities, income and expenses of the period (other than those described in note 1.2).

2.2 Nuclear developments

2.2.1 Flamanville 3 EPR

Developments in 2019

On 11 April 2019 [(1)], EDF announced that it was aware of the opinion of the Permanent Group of experts for nuclear pressure equipment (GP ESPN), made public on 11 April 2019, regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle [(2)] at the Flamanville EPR.

(1) Cf. press release of 11 April 2019.

(2) The break preclusion principle is a very high standard of quality with stricter requirements than nuclear pressure equipment regulations for the design, manufacturing and in-service monitoring of certain items of equipment. These stricter requirements must be sufficient to consider that rupture of this equipment is highly unlikely. When this standard is applied, a comprehensive study of the consequences of breaks in this piping is not required in the plant safety case.

The Nuclear Safety Authority (ASN) had held a meeting of the GP ESPN on 9 April 2019 as part of its investigation into these quality deviations:

- on 3 December 2018, EDF submitted a technical file to the ASN presenting the procedures for repairing and upgrading the main secondary circuit welds, which had shown deficiencies with respect to the break preclusion requirements, as well as for the specific justification method for the 8 welds located in the reactor containment building structure;
- the file was examined by the ASN, with technical support from the Institute for Radiation Protection and Nuclear Safety (IRSN);
- based on this examination, discussions took place at a GP ESPN meeting attended by EDF, which presented the background facts, their analysis and the methods for dealing with the issue. EDF answered all the Permanent Group of experts' questions for the technical examination of this file.

EDF indicated at the time that the recommendations and solution avenues suggested by the Permanent Group of experts could have an impact on the commissioning schedule and construction cost, and that EDF would continue its discussions with the ASN, which was to issue its decision regarding action to be taken on this matter a few weeks later.

Consequently, EDF stated that a detailed update of the schedule and construction cost for the Flamanville EPR would be given after the ASN's decision had been published.

On 20 June 2019 [(1)], EDF announced that it was aware of the decision issued by the ASN in its letter of 19 June 2019 regarding the quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle at the Flamanville EPR.

In that letter, the ASN asked EDF to repair the eight containment penetration welds at the Flamanville EPR that were not compliant with the break preclusion principle.

On 26 July 2019 [(2)], EDF announced that three scenarios for upgrading the penetration welds were under consideration, and that after a detailed examination of the three scenarios and discussions with the ASN, EDF would communicate the schedule and cost implications of the selected scenario in the next few months. EDF also stated that commissioning could not be expected before the end of 2022.

This work then resulted in discussions with the ASN, which sent EDF [(3)] a letter on 4 October 2019 concerning the technical feasibility of these three scenarios.

The penetration weld repair scenario presented as preferred by EDF involves the use of remote-operated robots, designed to conduct high-precision operations inside the piping concerned, a technology developed for nuclear power plants in operation that must be qualified for penetration weld repairs. The aim was to have this scenario qualified and validated by the ASN by the end of 2020, at which date EDF would be able to initiate the repair work. A second scenario involving extraction and realignment work in the Safeguard Auxiliary Buildings was held at this stage as a fall-back solution.

Based on this penetration weld repair strategy, the EDF Board of Directors approved continuation of the Flamanville EPR construction at a meeting held on 8 October 2019.

This led EDF to adjust the schedule and the estimated construction cost for the Flamanville [(4)] EPR.

The provisional schedule for implementation of the preferred penetration weld repair scenario, if the objective of ASN validation is achieved, sets the date of fuel loading in late 2022 and the revised construction cost at €12.4 billion[(5)], an increase of €1.5 billion. Most of these additional costs will be treated as operating expenses rather than being capitalised, and will affect the financial years 2020, 2021 and 2022.

Developments in 2020

The main developments at the Flamanville site in 2020 were the following:

The second hot functional test phase started on 21 September 2019 was completed in February 2020. Hot functional testing checks plant performance under simulated normal operating conditions.

In the context of the Covid-19 pandemic, after a cluster of cases was identified in the Manche area, work on the Flamanville site was restricted from mid-March to safety, security and environment monitoring work only (see note 2.1). General activity on the site resumed progressively from 4 May 2020 and was back to near-normal levels in July 2020.

Functional tests of the open reactor vessel were successfully completed between 21 May and 25 June 2020.

Following the ASN's decision of 8 October authorising partial commissioning of the EPR, the first fuel assemblies arrived at the site on 26 October and are stored in the reactor building pool.

In parallel, the upgrading work continued on non-penetration welds on the main secondary circuit that had quality deviations or did not meet the break preclusion requirements defined by EDF, and several welds were repaired in August 2020 once the ASN issued its first authorisations. EDF also decided to include the welds on the circuit supplying water to the steam generators in the scope of the repairs concerning the main secondary circuit. Qualification of the repair procedure for these welds is currently in process, with the objective of performing the work in the second half of 2021. At this stage, the repairs concern a hundred welds in the secondary circuits.

A review was conducted in 2020 of the impact of France's first national lockdown on the Flamanville project. This did not lead to any change to the fuel loading dates or the construction cost announced in October 2019, but it showed that the project has no remaining margin in its schedule or cost. However, achievement of the targets depends on a number of factors, notably the ASN's examinations of EDF's proposed methods for repairing the main secondary circuit welds, particularly the qualification of welding robots for repairing the penetration welds.

Work on these repairs cannot begin until the ASN makes its final decision as to approval of the entire process involving remote-controlled robots, which has been deferred to the first quarter of 2021. This phase of the project is among those in the critical path for on-schedule finalisation of the EPR. A further review of the project will be conducted in 2021.

2.2.2 Adjustment of the cost of the *Grand Carénage* programme

Since 2014 EDF has been implementing its *Grand Carénage* programme designed to enhance reactor safety and continue nuclear fleet operations beyond 40 years. The cost of this programme was estimated in 2015 at €55 billion (in 2013 euros) for the period 2014 to 2025. After optimisations and deferrals, this cost was revised in 2018 to €45 million in 2013 euros, *i.e.* €48.2 billion in current euros, still for the period 2014-2025.

On 29 October 2020, EDF adjusted the programme's cost for the same period to €49.4 billion in current euros.

The new cost estimate mainly reflects the first findings on the works to be conducted in the context of the ongoing fourth periodic safety review of the Group's 900MW reactors. This review focuses on studies, modification work and initially unplanned additional equipment to improve safety levels. The estimate also factors in the revised duration of scheduled maintenance outages for ten-year and partial inspections, in response to prior year experience and the impacts of the Covid-19 pandemic for the period 2020-2022 (see note 2.1).

The *Grand Carénage* programme is continuing with 33 ten-year inspections conducted at the Group's 900MW, 1,300MW and 1,450MW reactors, and 55 out of 56 emergency diesel generators commissioned.

The ASN's decision setting the requirements for 900MW reactors in the light of the conclusions of the generic phase of their fourth periodic review is expected by the end of February 2021.

(1) Cf. press release of 20 June 2019.

(2) Cf. press release of 26 July 2019.

(3) Cf. press release of 9 October 2019.

(4) The issue of deviation from the technical manufacturing standards for Framatome reactor components (stress-relieving heat treatment process for the welds with electrical resistance) concerns the four steam generators and pressuriser at Flamanville 3 EPR – see press release of 9 September 2019.

(5) In 2015 Euros, excluding interim interest.

2.3 Commissioning of EDF's new hydropower plant at Romanche-Gavet (Isère)

EDF commissioned France's biggest hydropower project, the new Romanche-Gavet hydropower plant in the Isère region of south-east France, after ten years of construction work. The new plant has a capacity of 97MW, and will increase hydropower output by 40% along its stretch of the river Romanche. This project illustrates EDF's commitment to developing hydropower, the largest source of renewable energy in France and Europe. It will produce a volume of power equivalent to annual electricity consumption by the cities of Grenoble and Chambéry (230,000 inhabitants), using a decarbonised and renewable energy source.

The Romanche-Gavet hydropower plant consists of a new dam and a new entirely underground plant deep in the mountain, replacing 6 former plants and 5 former dams. Blending seamlessly into the landscape of the Romanche valley, it is respectful of the environment and preserves biodiversity. Nature has been restored along the banks of the dam by replanting with local species sourced within a radius of 25 kilometres, in order to prevent the spread of invasive plants.

Construction of this facility involved an investment of €408 million, recognised under Property, plant and equipment operated under concessions (see note 16 (2)).

2.4 Financing operations

2.4.1 Issuance of bonds convertible into new shares and/or exchangeable for existing shares (OCEANEs)

On 8 September 2020, EDF made an offering of green bonds convertible into new shares and/or exchangeable for existing shares (OCEANEs Vertes) with the nominal amount of €2,400 million and an issue value of €2,569 million (i.e. an issue premium of €169 million). The key features of this issue are as follows:

(in millions of euros)	Issue date	Maturity	Issue amount	Currency	Rate
OCEANEs Vertes (see (1) note 33)	09/2020	09/2024	2,400	EUR	0%

The issue price for these bonds was €11.70, *i.e.* 107.00% of their nominal value or a gross annual return of -1.68%. The nominal value of the bonds was set at €10.93 corresponding to a conversion premium of 32.5% over the Company's reference price on Euronext Paris, the regulated Paris stock market [(1)].

Holders of these bonds have the right to convert them into new EDF shares and/or exchange them for existing EDF shares.

The conversion and/or exchange rate is set at one share per bond, subject to the standard adjustments including anti-dilution and dividend protections as described in the terms of the issue.

The bonds may be redeemed prior to maturity at the option of the Company, subject to certain conditions.

Unless previously converted, exchanged, redeemed or repurchased and cancelled, the bonds will be redeemed at nominal value when they reach maturity.

These bonds are listed on the Euronext AccessTM market operated by Euronext in Paris.

2.4.2 Hybrid note issues

On 8 September 2020, EDF launched two new issues of Euro-denominated hybrid notes for a total nominal amount of €2.1 billion, consisting of:

- a €850 million perpetual non-call hybrid notes issue with an initial coupon of 2.875% and a first redemption at the option of the Company on 15 December 2026; and
- a €1.250 billion perpetual non-call hybrid notes issue with an initial coupon of 3.375% and a first redemption at the option of the Company on 15 June 2030.

These issues are recorded in additional equity (see note 25).

The Company can redeem the hybrid notes for cash at any time during the 90 days before the first interest reset date, which is expected to be in 6.5 years (with a first reset date in March 2027) for the 6.5-year non-call hybrid notes, and in 10 years (with a first reset date in September 2030) for the 10-year non-call hybrid notes, and on every coupon payment date thereafter.

The settlement date was 15 September 2020 and the hybrid notes were admitted to trading on the regulated market of Euronext Paris at that date.

These issues show the Company's strong commitment to financing through hybrid capital securities, which are a permanent part of its capital structure. The proceeds of the hybrid notes issue are used for general corporate purposes of the Company.

These hybrid notes have been admitted to trading on Euronext Paris.

2.4.3 Signature of a €200 million credit facility indexed on ESG criteria with standard chartered bank

On 30 October 2020 EDF and Standard Chartered Bank signed a €200 million renewable credit facility. The cost of this facility will be indexed on three EDF sustainability KPIs: EDF's direct CO_2 emissions, electrification of its light vehicle fleet, and use of online consumption monitoring tools by its French residential customers.

The selected KPIs reflect EDF's major environmental commitments, principally cutting greenhouse gas emissions (CO2) by 50% by 2030 with a view to achieving carbon neutrality by 2050, and completing electrification of the entire EDF vehicle fleet by 2030.

(1) The reference price is equal to the volume-weighted average EDF share price observed on Euronext Paris between the launch date of the green bond offering until the final pricing of the bonds was determined the same day, i.e. €8.2465.

Note 3 Regulatory changes in France

3.1 France's multi-year energy programme (PPE)

The PPE covering the periods 2019-2028 was adopted by decree 2020-456 of 21 April 2020, published in the *Journal officiel* of 23 April 2020. The points on which the final programme differs from the drafts published on 25 January 2019 and 20 January 2020 essentially relate to renewable energies. The PPE sets a target of doubling the 2017 level of installed capacity for electricity from renewable energies by 2028, and increasing offshore wind power capacities, with 6 project tenders to be launched in the first PPE period. EDF's strategy is entirely consistent with this aim.

To reduce nuclear power output, as well as the closure of the two Fessenheim reactors in the spring of 2020 (see note 5), 12 nuclear reactors will have to be shut down by 2035. The reactors concerned will be shut down when their fifth 10-year inspection is due, except for two reactors which will be shut down earlier in 2027 and 2028 (two additional reactors could also be shut down in 2025-2026 if certain conditions, notably relating to electricity prices and secure supply, are fulfilled). Priority will be given to shutdowns that minimise the economic and social impact, have the lowest impact on the electricity network, and do not entail closure of an entire site. At the request of the French government, based on these criteria, on 20 January 2020 EDF proposed to examine the possibility of shutting down pairs of reactors at the sites of Blayais, Bugey, Chinon, Cruas, Dampierre, Gravelines and Tricastin. The PPE stipulates that early reactor shutdowns will be confirmed 3 years prior to implementation.

A draft PPE published on 25 January 2019 by the Ministry for the Ecological and Inclusive Transition stated that the Government, together with the industry, would conduct a programme of work by mid-2021 to examine the questions of the cost of new nuclear energy production and its advantages and disadvantages in relation to other low-carbon generation methods, the possible financing models, the project management modalities for new reactor projects and public consultation, and matters relating to the management of waste generated by the potential new nuclear fleet; based on this information and depending on developments in the energy situation, the Government will make a decision regarding the suitability of launching a renewal programme for nuclear installations. EDF is fully mobilised in the investigation and preparation of all aspects of these matters, in conjunction with the public authorities.

Adoption of the PPE in April 2020 led to re-estimation of nuclear provisions at 30 June 2020, referring to various scenarios for the early shutdowns of two reactors in 2027 and 2028. This resulted in a €32 million increase in nuclear provisions at 31 December 2020 (mainly decommissioning provisions) (see note 28). Accelerated depreciation periods were also estimated based on these scenarios, leading to an increase in depreciation in the second half of the year, with no significant impact on EDF's financial statements (see note 1.2.1).

The reactor shutdowns at the Fessenheim plant took place on 22 February 2020 for reactor 1 and 30 June 2020 for reactor 2, in accordance with decree 2020-129 of 18 February 2020 terminating the plant's operating licence (see note 5).

Public consultation on regulation of existing nuclear facilities

As announced in the draft PPE published on 25 January 2019, in January 2020 the French government launched a call for contributions regarding the fundamental findings driving the plan to reform the economic regulations for existing nuclear facilities, and their construction and operating principles. The proposed regulations would replace the ARENH mechanism and require EDF to provide a service of general economic interest (SGEI) for protection of the consumer and the climate.

This SGEI would be supported by economic regulation of the existing nuclear fleet, to reconcile and contribute to the following aims:

- long-term protection of all consumers located on French territory, regardless of their supplier and with respect to some of their non-peak power supplies, by enabling them to benefit from stable conditions for carbon-free, manageable production of electricity by the existing nuclear fleet they helped to finance;
- achievement of the climate targets France has set itself, and also of its objectives for a secure power supply and energy independence, by safeguarding the carbon-free electricity supply in France and more broadly in Europe, through secure long-term financing for operation of the existing nuclear installations that are necessary for that supply.

Like many other actors in the sector, EDF participated in this consultation, which ended on 17 March 2020.

In this context, France's Minister for the Ecological and Inclusive Transition and Minister of the Economy and Finance commissioned the CRE to carry out an assessment of the costs borne by the nuclear operator, and to determine fair remuneration for its nuclear activities under the government's potential future regulations. At a hearing before the French National Assembly's Economic Affairs Committee on 7 July 2020, the CRE Chairman Jean-François Carenco stated that the CRE had sent its report on the cost of nuclear power in France to the government. The CRE also presented the conclusions of that report to the European Commission's Directorate-General for Competition on 16 July 2020.

The terms and conditions of new regulations governing existing nuclear facilities are currently being examined by the French government and the European Commission.

3.2 Regulated electricity sales tariffs in France ("Blue" tariffs)

In accordance with Article L. 337-4 of the French Energy Code, regulated electricity sales tariffs are set by the Ministers for Energy and the Economy following proposals by the French Energy Regulatory Commission (Commission de régulation de l'énergie or CRE).

France's Council of State ruled in decisions of 18 May and 3 October 2018 that the principle of regulated electricity sales tariffs is compatible with European Union law when such tariffs serve the general economic interest objective of guaranteeing consumers an electricity price that is more stable than market prices.

In accordance with European Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity, the French Energy and Climate law of 8 November 2019 authorises continuation of regulated sales tariffs, but they are reserved for residential or business consumers with a subscribed power level of up to 36kVA, provided they have fewer than 10 employees and their annual sales, income or balance sheet total is below €2 million.

France's Energy and Climate law, which sets out the terms of the partial discontinuation of regulated sales tariffs for non-residential customers, and the associated implementing decisions, are presented in note 3 to the financial statements at 31 December 2019.

2020 was marked by implementation of laws, particularly regarding:

- identification of customers' eligibility or non-eligibility for regulated sales tariffs;
- making data available to other suppliers; and
- informing non-eligible customers of the termination date of their regulated-tariff contract and the need to subscribe a market-rate contract taking effect no later than 1 January 2021 with the supplier of their choice. Customers failing to do so accept automatically to switch to a market-rate contract validated by the CRE with their current supplier.

Tariff changes

In accordance with Article L. 337-4 of the French Energy Code, the CRE is responsible for sending the Ministers for the Economy and Energy its reasoned proposals for regulated sales tariffs for electricity. If no objections are made within three months, the proposals are deemed to have been approved.

In a decision of 16 January 2020, the CRE proposed an increase of 2.4% (including taxes) in the "blue" tariffs for residential and non-residential customers (3.0% excluding taxes for residential customers and 3.1% excluding taxes for non-residential customers). This proposed increase takes account of the rise in prices on the wholesale energy markets, the level of ARENH curtailments for 2020, higher selling costs including the costs of purchasing Energy Savings Certificates, and the adjustments made to narrow the gap between costs and revenues observed on regulated electricity sales tariffs during 2019. This CRE proposal was confirmed by tariff decisions of 29 January 2020 that were published in the *Journal officiel* of 31 January 2020, and applied from 1 February 2020.

In a decision of 2 July 2020, in view of changes in the TURPE network access tariffs applicable from 1 August 2020 and in application of the Energy Code, the CRE proposed an increase of 1.54% including taxes (1.82% excluding taxes) in the "blue" tariffs for residential customers and 1.58% including taxes (1.81% excluding taxes) in the "blue" tariffs for non-residential customers. This CRE proposal was confirmed by a tariff decision of 29 July 2020 that was published in the *Journal officiel* of 31 July 2020, and applied from 1 August 2020.

In a decision of 14 January 2021, the CRE proposed an increase of 1.61% including taxes (1.93% excluding taxes) in the "blue" tariffs for residential customers and 2.61% including taxes (3.23% excluding taxes) in the "blue" tariffs for non-residential customers from 1 February 2021. This proposed increase takes particular account of the rising cost of energy supplies and capacity guarantees, the "catch-up" adjustment to cover the cost-income differential on regulated sales tariffs in 2019 and 2020, movements in selling costs associated with unpaid receivable forecasts for 2021, particularly in the context of the Covid-19 pandemic, and adjustment of selling costs for non-residential customers who are still eligible for the regulated tariffs. This CRE proposal was confirmed by tariff decisions of 28 January 2021 that were published in the *Journal officiel* of 31 January 2021, and has applied since 1 February 2021.

Second TURPE 5 Distribution tariffs (delivery services included in consumption of the period from external sources)

On 25 June 2019 the CRE adopted a decision concerning revision of the TURPE 5 tariff for the medium and low-voltage network at 1 August 2019. The tariff scale increased by an average +3.04% from 1 August 2019, comprising +1.61% for inflation, +1.45% to balance the income and expenses adjustment account CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

By a decision of 20 May 2020, the CRE adopted a +2.75% increase to the second TURPE 5 tariff for the medium and low-voltage network from 1 August 2020. This increase comprises +0.92% for inflation, +1.85% to balance the CRCP, and -0.02% in application of the Council of State's decision of 9 March 2018.

3.3 Supplier commissioning

After Law 2017-1839 of 30 December 2017 confirmed the CRE's competence for supplier commissioning, the CRE issued a decision on 18 January 2018 reiterating the principles adopted in its previous decision of 26 October 2017 regarding remuneration payable by distribution network operators to suppliers for the service of managing single-contract customers on their behalf.

This decision upheld the principle of identical commissions for all suppliers selling single-contract market-price offers. Only regulated electricity tariffs give rise to slightly lower commissions (€4.50 instead of €6.80 per point of delivery until 1 August 2019), with progressive reduction of this difference to zero by 1 August 2022.

For remuneration of past customer management charges (prior to 1 January 2018), the CRE's decision set an amount it considered as a cap that can be passed on through the TURPE tariff.

However, Law 2017-1839 of 30 December 2017 introduced a measure intended to rule out the possibility of suppliers receiving remuneration from network managers for past customer management services.

3.4 Electricity Equalisation fund

The TURPE tariff for the medium and low-voltage network is identical for every electricity network operator. It is determined on the basis of forecast expenses to be borne by Enedis, provided they correspond to an efficient network operator, and forecasts of the number of consumers connected to Enedis' networks, their consumption, and the power level subscribed.

As this tariff cannot always cover the specific needs of certain service zones, the Electricity Equalisation Fund (FPE) exists to compensate for disparities in network operating conditions. The Energy Code requires electricity distribution costs resulting from public network operation to be shared between public distribution network operators. A normative formula for calculating the cost allocation is defined in a decree and a ministerial order and applies to all distribution network operators, including SEI at EDF.

On 23 July 2020, the CRE published its decision setting the final amount of the allocation from the Electricity Equalisation Fund (Fonds de Péréquation de l'Électricité) to SEI, Électricité de Mayotte and Gérédis, the three operators that opted for assessment based on the CRE's analysis of their accounts. SEI's allocation amounts to €198.5 million for 2020.

3.5 Compensation for public energy charges (CSPE)

Mechanism

The compensation mechanism for public energy service charges (*compensation des Charges de Service Public de l'Energie*) resulted from a reform introduced by France's amended finance law for 2015, published in the *Journal officiel* on 30 December 2015. Under the legislative and regulatory framework, the public energy service charges (electricity and gas) were to be compensated *via* two State budget items included in France's finance laws from 2016 onwards. The initial finance law for 2020 marked a continuation from 2019, defining the following measures for compensation of charges for 2020:

- a special "energy transition" budget item of €6.3 billion, principally to compensate for the additional costs associated with all contracts obliging the operators to purchase renewable energies and (to a much smaller degree) biogas, and covering the last annual contribution to repayment of the accumulated shortfall in compensation due to EDF;
- a "Public Energy Service" item of €2.7 billion in the general budget, notably to cover solidarity charges borne by gas and electricity suppliers, costs associated with purchase obligations excluding renewable energies (essentially cogeneration), and the cost of applying the standard national tariffs to zones that are not connected to France's mainland network. The interest on the accumulated shortfall to be repaid to EDF is also funded through the general budget.

From 1 January 2018, the "basic necessity" rates for electricity and the "special solidarity" rates for gas were replaced by an energy voucher system. The cost of this system is not borne by EDF, but budgeted by the State in the "Public Energy Service" programme. EDF has borne solidarity charges for the national housing solidarity fund and services for vulnerable customers in both 2019 and 2020.

In 2020, this mechanism of compensation for public service charges was funded as follows:

- the costs linked to the energy transition, which correspond to the subsidy mechanisms for renewable energies, and the reimbursement of the past accumulated shortfall in compensation borne by EDF as measured at 31 December 2015, are registered in a special "energy transition" budget item created by the amended finance law for 2015. Law no. 2016-1917 of 29 December 2016 (the finance law for 2017) stipulated that the two sources of additional funding for this special budget item would be a portion of the domestic tax on coal, lignite and coke (TICC), and a portion of the domestic tax on energy products (TICPE), the latter providing most of the funding. The finance law for 2020 replaced the percentages of the TICC and TICPE by a set amount, to avoid the uncertainties of forecast income from these taxes, and broadened the sources of funding for the "energy transition" budget item by including the proceeds of auctions of Guarantees of Origin as allowed by Article L. 314-14-1 of the Energy Code. The initial French finance law for 2020 also proposed to discontinue this "energy transition" budget item in 2021, with the costs concerned subsequently covered directly by the general budget;

- other public service charges excluding costs associated with the subsidy mechanisms for renewable energies (*i.e.* costs relating to fuel poverty, tariff equalisation in zones that are not connected to France's mainland network, cogeneration, the budget for the energy ombudsman, etc.) are registered directly in the general budget;
- income generated by the domestic tax on the final consumption of electricity, now renamed the Compensation for Public Electricity Charges (CSPE) goes directly into the general budget. The CSPE tax is collected directly from final consumers of electricity in the form of an additional levy on the electricity sale price (and collected from electricity suppliers), or directly from electricity producers that produce electricity for their own uses.

The level of the CSPE tax was set in 2016 at a full rate of €22.5/MWh, and eight reduced rates ranging from €12/MWh to €0.5/MWh depending on criteria of electro-intensiveness, business category and the risk of carbon leakage from installations (the risk of industries relocating to countries where greenhouse gas emissions are higher due to their electricity mix). The level remains unchanged in 2020.

The amended finance law no. 4 for 2020 also applied an upward adjustment to the amounts of compensation payable by the State in 2020 for:

- public service charges borne in 2019 (the total differential observed between the readjusted forecast for 2019 charges established in July 2019 and the actual charges for 2019 observed in July 2020);
- and public service charges borne in 2020 (the partial differential between the initial forecast for 2020 charges established in July 2019 and the readjusted forecast established in July 2020).

These expenses had increased due to the larger differential between the market price for electricity and the purchase obligation tariff payable to producers.

EDF's Public Service charges

The amount of expenses (excluding the annual contribution to repayment and associated interest) to be compensated to EDF for 2020 is €8,081 million.

The amounts received in 2020 (excluding the annual contribution to repayment and associated interest) totalled €7,732 million (including €5,333 million from the dedicated "energy transition" budget account and €2,399 million from the general budget).

Based on a receivable of €1,647 million at 31 December 2019, the operating receivable owed by the State to EDF amounts to €1,974 million at 31 December 2020. The situation will be closely monitored in view of the initial Finance Law for 2020 adopted by vote in late 2019, which provides for discontinuation of the special "energy transition" budget item from January 2021.

Finally, in accordance with decree 2016-158 of 18 February 2016 concerning compensation for public energy service charges, on 17 July 2020 the CRE published its decision 2020-177 of 15 July 2020 setting out a forecast of EDF's public service charges for 2021 (€8,104 million), a revised forecast of charges for 2020 (€8,122 million), and the actual charges recorded for 2019 (€7,585 million).

3.6 Capacity mechanism

The French capacity mechanism took effect on 1 January 2017. It was introduced by France's Energy Code to ensure secure national power supplies.

In view of the risks induced by the Covid-19 pandemic regarding electricity supply security for the winter 2020-2021, and to maximise the utility and efficiency of the capacity mechanism, RTE made exceptional adjustments to certain conditions and relaxed certain regulatory constraints for capacity operators willing to increase their availability (notably waiving higher balance adjustment fees and late certification fees).

RTE thus issued a summary of transparency information currently available on the capacity mechanism on 18 September 2020, to enable the actors to assess the supply-demand balance situation for capacity guarantees in the mechanism for the next few years.

RTE also organised two further balance adjustment sessions for 2020, and made changes to the 2021 Demand Response tender to make it more attractive. The volumes offered and accepted doubled, and a bonus was added for capacities that could be offered as soon as November 2020.

2020 registered a significant increase in capacity prices for 2020 and subsequent years from the auction in June. This is mainly explained by the market actors anticipating lower fleet availability for peak periods, in the context of the Covid-19 crisis (see note 2.1).

The market reference prices for 2017, 2018, 2019 and 2020 were established respectively at €10.0/kW, €9.3/kW, €17.4/kW and €19.5/kW. Six auctions held in 2020 (March, April, June, September, October, December) for deliveries in 2021 resulted in the following prices, in chronological order: €19.5/kW, €19.2/kW, €47.4/kW, €29.5/kW, €32.7/kW, and €39.1/kW.

The delivery year 2022 was also opened to auction in 2020. The four capacity auctions held resulted in the following prices, in chronological order: €16.6/kW, €38.9/kW, €18.1/kW and €18.2/kW.

3.7 Energy savings certificates

Decree 2017-690 of 2 May 2017 issued by the French Ministry for the Environment, Energy and the Sea substantially raised the obligation levels for the fourth period of energy savings obligations (initially running from 1 January 2018 to 31 December 2020) to 1,200TWhc for the "standard" obligations and 400TWhc for the obligations that are intended to benefit households in situations of energy poverty, compared to 700TWhc and 150TWhc respectively for the previous period.

Law no. 2019-1147 of 8 November 2019 relating to Energy and the Climate, as well as prolonging the fourth period of the Energy Savings Certificates scheme, included a chapter on measures against fraud concerning these certificates designed to increase the number and effectiveness of controls and sanctions.

If there is a shortfall in certificates surrendered at the end of the period, obligated actors must pay a fine of €15 per MWhc of shortfall.

In order to fulfil these obligations, EDF made every effort to gradually increase its number of Energy Savings Certificates, taking advantage of the *Coup de pouce* operations launched in France early in 2019 (subsidies for insulation, financial aid for replacing oil heating by heat pumps, 50% additional energy savings subsidy for heat pump users, special offers for heat pump maintenance contracts, etc.).

EDF currently considers that due to the combined effect of the expected increase in certificates earned by the end of 2021 and the extension of the fourth period, there is no risk of a shortfall in Energy Savings Certificates at the end of the period.

3.8 ARENH

The ARENH [1] scheme for regulated access to historic nuclear power, set up in 2011, entitles alternative suppliers to purchase electricity from EDF to supply their final customers, after signing a framework agreement, at a regulated price for set quantities determined under the provisions of the French Energy Code. This scheme is also open to network operators to cover their energy losses.

The ARENH price, determined by the Ministers for Energy and the Economy following a proposal by the CRE, has been maintained at €42/MWh since January 2012. This includes delivery of the electricity and is considered to incorporate the associated capacity guarantees.

The maximum total volume that can be sold under the ARENH system to suppliers who apply to the scheme to cover the needs of their final customers was initially set at 100TWh per year.

In decision 2020-277 of 12 November 2020, as required by the Energy Code, the CRE set out the method for allocating ARENH volumes if applications exceed the maximum total volume defined for 2021. This decision stipulated that if the ARENH was oversubscribed in November 2020, curtailment would only apply to new ARENH applications made in the session concerned.

(1) Accès Régulé à l'Énergie Nucléaire Historique.

It also stated that EDF-controlled subsidiaries' excess applications would be fully curtailed (this does not apply to network operators) and they could enter into contracts with the parent company that replicate the ARENH system and terms of supply, particularly the curtailment rate for alternative suppliers. In the method proposed by the CRE in decision 2020-002 concerning regulated sales tariffs for electricity, this curtailment mechanism, when applied, makes reference to market prices more influential in determining regulated sales tariffs.

Decree 2020-1414 of 19 November 2020 modified the regulatory section of the Energy Code concerning the ARENH and CSPE mechanisms, setting out the method for allocating the ARENH price supplement paid between suppliers and EDF, and assigning to the CRE the task of defining the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached. The same decree modified the measures applicable in the event of default on payment, stipulating that the purchaser concerned is banned from ARENH sales for a one-year period as soon as the electricity transfer is first stopped.

The Energy and Climate law of 8 November 2019 introduced new measures. It raised this initial 100TWh ceiling to 150TWh from 1 January 2020, allowing the French government to raise the maximum total volume of ARENH deliveries above 100TWh, and to revise the ARENH price by ministerial decision during a transition period. However, the Ministry for the Ecological and Inclusive Transition announced that no change would be made to the ARENH price or volume for 2021.

ARENH applications during the November 2020 session for delivery in 2021 totalled 146.2TWh (excluding applications from EDF subsidiaries). Since the maximum total volume has not been modified, the volume to be delivered totalled 100TWh and as in the previous year the CRE curtailed each supplier's application. Further volumes were also sold by EDF to its subsidiaries through contracts that replicate the ARENH mechanism, and to compensate for network losses (26.3TWh).

In the context of the Covid-19 pandemic, in decision 2020-071 of 26 March 2020 the CRE introduced measures in favour of suppliers benefiting from the ARENH mechanism. These measures consisted of cancelling the "CP2" (price supplement) [(1)] penalty for excessive ARENH applications for the year 2020, and deferring settlement of ARENH invoices upon request by the supplier, under the terms defined in ordinance 2020-316 of 25 March 2020 on settlement of invoices, as detailed in CRE decision 2020-076 of 9 April 2020.

EDF has also offered special payment terms to small suppliers in a fragile position. The application methods for these terms were established by CRE decision 2020-076 of 9 April 2020.

Litigation relating to the ARENH mechanism has also been instigated by some energy suppliers in the context of the Covid-19 pandemic. Details are provided in note 2.1.

In its decision 2020-315 of 17 December 2020, the CRE proposed changes to the ARENH master agreement model to incorporate the modifications introduced by decree 2020-1414. In decisions 2020-277 of 12 November 2020 and 2020-285 of 2 December 2020, it also set out the methods for calculation and allocation of the ARENH price supplement if the maximum volume is reached.

Income statement

Note 4 Sales

Sales are comprised of:

(in millions of euros)	2020	2019
Sales of energy*	**41,692**	**43,831**
electricity	37,456	38,392
gas	4,236	5,439
Sales of services and other	**2,623**	**2,324**
SALES	**44,315**	**46,155**

* *Including a share of delivery costs for sales of electricity and gas.*

The variation in electricity sales in 2020 is mainly due to unfavourable volume effects, including:

- the 44.1TWh decrease in nuclear power output, due to the direct and indirect effects of the Covid-19 pandemic totalling 32.9TWh (see note 2.1);
- lower demand for electricity as a result of the Covid-19 pandemic, leading to sales on the wholesale markets at lower prices;
- milder weather in 2020 than 2019;
- changes in the customer portfolio.

These effects were partly offset by favourable price effects on market offers and sales at regulated tariffs. For the regulated tariffs, the price effect results from indexing of tariffs from 1 June 2019 (+7.7% on "blue" tariffs for residential and non-residential customers), 1 August 2019 (+1.49% on "blue" tariffs for residential customers and +1.34% on "blue" tariffs for non-residential customers), 1 February 2020 (+3.0% on "blue" tariffs for residential customers and +3.1% on "blue" tariffs for non-residential customers) and 1 August 2020 (+1.82% on "blue" tariffs for residential customers and +1.81% on "blue" tariffs for non-residential customers).

In gas sales, the decrease principally relates to sales with EDF Trading in a context of falling market prices in 2020.

Sales of services were higher as a result of gains on sales of capacity certificates, as the price of capacity certificates for 2020 and subsequent years rose substantially from the June session onwards (see note 3.6).

The estimated impact of the Covid-19 pandemic on sales in 2020 is €(1,117) million (see note 2.1).

(1) Penalities for excessive ARENH applications.

Note 5 Operating subsidies

(in millions of euros)	2020	2019
OPERATING SUBSIDIES	**8,148**	**7,670**

CSPE

Operating subsidies mainly comprise the subsidy received or receivable by EDF in respect of the compensation for public energy charges (CSPE), recognised in the financial statements as income of €8,081 million for 2020 (€7,662 million for 2019).

The increase is mainly explained by the higher subsidy for purchase obligations due to the lower market prices for electricity observed in the first half of 2020, and the increase in purchased volumes of photovoltaic power (+8%) and wind power (+5%).

Closure of Fessenheim nuclear power plant

In accordance with the application for termination of operations and the declaration of the permanent shutdown of both reactors at Fessenheim nuclear power plant sent by EDF to the Minister for the Ecological and Inclusive Transition and to the ASN on 30 September 2019, EDF shut down reactor 1 on 22 February 2020 and reactor 2 on 30 June 2020.

On 27 September 2019, due to the cap on nuclear power output set by the "energy transition for green growth" law of 17 August 2015, the French State and EDF signed a protocol agreement whereby the State will compensate EDF for the early closure of Fessenheim.

The compensation paid under the terms of this protocol comprises:

- initial instalments to compensate for expenses incurred after the closure of the plant (end-of-operations expenditure, INB taxes, dismantling costs and staff redeployment costs), which will be paid over a maximum 4-year period following the closure. An amount of €370 million was received on 14 December 2020.

  This compensation is recognised as income in profit and loss as and when the associated costs are incurred;
- subsequent payments corresponding to the lost income that would have been generated by future power generation up until 2041, based on Fessenheim's previous output figures and calculated *ex post* on the basis of nuclear power sale prices, particularly observed market prices.

Since its decoupling from the network, the Fessenheim plant has entered a post-operating phase that will last approximately five years. During that period, units 1 and 2 will continue to be operated and maintained as "defueled core" and "evacuated fuel" reactors. This will require a series of technical and administrative operations.

All the post-operating expenses and income associated with the closure of the two units in 2020 are recognised in operating expenses. At 31 December 2020, they mainly comprise:

- expenses of €113 million (salaries and social security charges for labour at the site amounting to €42 million, purchases of goods and services amounting to €43 million, taxes other than income taxes, mainly payroll taxes, energy taxes and local taxes amounting to €28 million);
- the compensation defined in the protocol for expenses that will be incurred after the closure, amounting to €50 million, recognised as an operating subsidy in the income statement under the methods explained above.

The estimated impact of the Covid-19 pandemic on operating subsidies in 2020 is €(37) million, attributable to the lower level of surplus costs for energy purchases and generation in the island territories, in line with the decline in electricity consumption.

Note 6 Reversals of provisions and impairment

(in millions of euros)	Notes	2020	2019
Reversals of provisions for risks*	**27**	**387**	**552**
Pensions and similar obligations	*30*	795	826
Spent fuel management	*28*	744	890
Long-term radioactive waste management	*28*	246	261
Decommissioning of nuclear power plants	*28*	181	141
Last cores	*28*	99	-
Decommissioning of thermal and hydropower plants		30	35
Other provisions for expenses		88	187
Reversals of provisions for expenses		**2,183**	**2,340**
Reversals of impairment		**253**	**387**
TOTAL REVERSALS OF PROVISIONS AND IMPAIRMENT		**2,823**	**3,279**

* *Including in 2020 a reversal of €117 million (€184 million in 2019) corresponding to costs booked in 2018 on long-term regasification capacity reservation contracts of Dunkerque LNG.*

Note 7 Other operating income and transfers of charges

(in millions of euros)	2020	2019
Other operating income	745	753
Transfers of charges	101	96
OTHER OPERATING INCOME AND TRANSFERS OF CHARGES	**846**	**849**

Note 8 Purchases and other external expenses

(in millions of Euros)	2020	2019
Fuel purchases used (1)	3,269	3,498
Energy purchases (2)	16,783	18,232
Services and other purchases used (3)	16,161	16,360
PURCHASES AND OTHER EXTERNAL EXPENSES	**36,213**	**38,090**

(1) Fuel purchases used include costs relating to raw materials for energy generation (principally nuclear fuels and fissile materials, to a lesser extent gas, and coal and oil in very small proportions), and purchases of services related to the nuclear fuel cycle. Fuel purchases used have decreased due to the lower nuclear power output in 2020, and the decrease in gas purchases for CCG (Combined Cycle Gas) facilities.

This item also includes greenhouse gas emission rights used (see note 1.19.1):

- *at 31 December 2020, the volume of emissions was 5 million tonnes (6 million tonnes in 2019);*
- *in 2020 EDF surrendered 6 million tonnes in respect of emissions generated in 2019 (8 million tonnes were surrendered in 2019 in respect of emissions generated in 2018).*

(2) Energy purchases include purchases made under electricity purchase obligations. The decrease in energy purchases is principally explained by the decrease in electricity and gas purchases on the markets.

(3) Service purchases include distribution network access fees invoiced by the subsidiary Enedis. Excluding delivery, service purchases increased by €285 million between 2019 and 2020, and in 2020 they include €383 million of additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR (see note 16 (4)).

The estimated impact of the Covid-19 pandemic on purchases and other external expenses in 2020 is €(463) million (see note 2.1).

Note 9 Taxes other than income taxes

Details of taxes other than income taxes are as follows:

(in millions of euros)	2020	2019
Taxes on salaries and wages*	169	144
Energy-related taxes	1,242	1,246
Local Economic Contribution	500	524
Property taxes	469	453
Other taxes	314	307
TOTAL TAXES OTHER THAN INCOME TAXES	**2,694**	**2,674**

* *Under the reform of France's apprenticeship tax and training contribution system introduced by Law 2018-771 of 5 September 2018, no apprenticeship tax was due on employee remuneration paid in 2019.*

Note 10 Personnel expenses

(in millions of euros)	2020	2019
Salaries and wages	3,694	3,654
Social contributions	2,745	2,799
PERSONNEL EXPENSES	**6,439**	**6,453**

The estimated impact of the Covid-19 pandemic on personnel expenses in 2020 is €68 million (see note 2.1).

Excluding this impact, the decrease in personnel expenses mainly reflects the lower workforce numbers.

In 2020, personnel expenses include €26 million of additional costs relating to repair work on the main secondary circuit welds in the Flamanville 3 EPR (see note 16 (4)).

	2020			2019
	Executives	Non executives	Total	Total
IEG status	27,187	31,050	58,237	59,349
Other	1,972	2,253	4,225	4,181
AVERAGE WORKFORCE	**29,159**	**33,303**	**62,462**	**63,530**

Average workforce numbers are reported on a full-time equivalent basis.

Note 11 Operating depreciation, amortisation and provisions

11.1 Depreciation and amortisation

(in millions of euros)	2020	2019
Amortisation of intangible assets	296	266
Depreciation on property, plant and equipment:		
• owned by EDF [(1)]	3,925	3,401
• operated under concessions [(2)]	292	282
Total depreciation and amortisation on fixed assets	**4,513**	**3,949**
Other depreciation and amortisation and deferred expenses	**25**	**26**
TOTAL DEPRECIATION AND AMORTISATION	**4,538**	**3,975**

(1) In view of France's Energy and Climate law of 8 November 2019, the ends of the depreciation periods for the Le Havre and Cordemais coal-fired plants were changed at 1 June 2019, setting the closure of Le Havre at 1 April 2021 while Cordemais is to continue operating until 2026, considering a possible conversion to biomass as part of the Ecocombust project. The date for Cordemais could still change depending on the decisions made about the project, which is currently under review by the public authorities. As a result of this change of dates, accelerated depreciation compared to the previous depreciation period is now recognised, amounting to €245 million in 2020 (€139 million in 2019).

(2) This depreciation concerns the Island Energy Systems public electricity distribution concessions, and hydropower concessions.

11.2 Provisions and impairment

(in millions of euros)	*Notes*	2020	2019
Provisions for risks [(1)]	***27***	**720**	**656**
Pensions and similar obligations	*30*	798	674
Spent fuel management	*28*	625	535
Long-term radioactive waste management	*28*	107	189
Decommissioning of nuclear power plants and last cores	*28*	133	105
Decommissioning of thermal and hydropower plants		-	2
Other provisions for expenses		210	112
Provisions for expenses		**1,873**	**1,617**
Impairment [(2)]		**383**	**342**
TOTAL PROVISIONS AND IMPAIRMENT		**2,976**	**2,615**

(1) The increase at 31 December 2020 principally concerns energy supply and sale contracts.

(2) The change mainly concerns impairment on trade receivables, particularly in line with the Covid-19 pandemic (see note 2.1).

Note 12 Other operating expenses

Other operating expenses amount to €2,738 million in 2020 (€2,241 million in 2019) and notably include losses on non-recoverable receivables, royalties on software, costs relating to Energy Savings Certificates used or consumed over the year, the net book value of assets demolished or scrapped, and additional remuneration paid to producers of electricity from renewable sources.

The increase in other operating expenses is notably explained by higher costs relating to Energy Savings Certificates and the increase in the additional remuneration paid to producers of electricity from renewable sources. This additional remuneration was introduced by France's law on the Energy Transition for green growth. It is a support mechanism intended to guarantee reasonable remuneration for producers who sell their energy directly on the markets, by compensating for the differential between the revenues from those sales and a reference amount. This mechanism complements the purchase obligation system.

Note 13 Financial result

(in millions of euros)		2020		2019
Income from investments [1]		1,782		1,427
Income from other securities and receivables related to fixed assets [2]		638		757
Interest and similar income and expenses		**(1,408)**		**(1,483)**
• *Expenses on long-term financial liabilities after hedging*	*(1,717)*		*(1,822)*	
• *Other*	*309*		*339*	
Foreign exchange result		(232)		(145)
Gains and losses on sales of marketable securities		(106)		(70)
Increases/Decreases in provisions and transfers of charges:		**(3,177)**		**(2,187)**
• *Discount expense on employee benefits*	*(395)*		*(614)*	
• *Discount expense on nuclear provisions* [3]	*(2,558)*		*(1,988)*	
• *Provision on investment securities* [4]	*(49)*		*550*	
• *Reversals from provisions, impairment and transfers of charges*	*535*		*485*	
FINANCIAL RESULT		**(2,503)**		**(1,701)**

(1) The change in dividends received principally concerns:
- *Enedis (€508 million in 2020 and €556 million in 2019);*
- *C3 Holding (the holding company which carries EDF Investissements Groupe) (€149 million in 2020 and €156 million in 2019);*
- *EDF Holding (the holding company which carries EDF Trading) (€443 million in 2020, no equivalent in 2019);*
- *PEI (€94 million in 2020 and €88 million in 2019);*
- *EDF Immo (€72 million in 2020 and €241 million in 2019);*
- *CTE (€184 million in 2020 and €157 million in 2019);*
- *EDEV (€72 million in 2020 and €38 million in 2019);*
- *Framatome (€47 million in 2020 and €36 million in 2019).*

(2) In 2020, this item includes income of €6 million (€24 million in 2019) for the cost of bearing the CSPE financial receivable.

(3) In 2020, the discount expense on nuclear provisions increased, due to the effect of a lower real discount rate than the previous year (this rate was 2.1% at 31 December 2020, 2.3% at 31 December 2019 and 2.4% at 31 December 2018) (see note 28.5.1).

(4) The change is principally due to less favourable financial market trends in 2020 than 2019.

Note 14 Exceptional result

At 31 December 2020, exceptional items resulted in net income of €425 million. The main items were the following:

- net gains of €780 million on sales of investment securities included in dedicated assets, undertaken in the course of operational portfolio management;
- net reversals of €175 million from excess tax depreciation;
- recognition of a provision for tax litigation of €(538) million following the Council of State's decision of 11 December 2020 (see note 31). For the period 2008 to 2017, EDF was notified of proposed tax adjustments, notably concerning the tax-deductibility of certain long-term liabilities. As stated in the 2019 financial statements, this recurrent reassessment, which is applied for each year, represented a cumulative financial risk of some €556 million in income taxes at 31 December 2019. In two rulings made in 2017 and one in 2019, Montreuil Administrative Court recognised the tax-deductibility of these liabilities and validated the position taken by the Company. The Minister appealed against two of these rulings. In January 2020, the Versailles Administrative Appeal Court upheld EDF's position for the year 2008, but the Minister again appealed. In a decision of 11 December 2020 the Council of State overturned the Versailles court's decision and sent the case back before the same court.

At 31 December 2019, exceptional items resulted in net income of €547 million. The main items were the following:

- net gains of €619 million on sales of investment securities included in dedicated assets, undertaken in the course of operational portfolio management;
- net reversals of €144 million from excess tax depreciation.

Note 15 Income taxes

15.1 Tax group

Since 1 January 1988, EDF and certain subsidiaries have formed a group subject to the tax consolidation system existing under French tax legislation (Articles 223A to 223U of the French Tax Code). The tax consolidation group comprises 267 subsidiaries in 2020, including Enedis, EDF International, EDF Renewables and Dalkia.

15.2 Income tax payable

Under Article 223A of the French Tax Code, EDF, as the head of the tax consolidated group, is the sole entity responsible for payment of income taxes and additional related contributions.

The tax consolidation agreement between the members of the tax group stipulates that the arrangement must be neutral in effect. In application of this principle, each subsidiary pays the consolidating company a contribution to group income tax equivalent to the tax it would have paid had it been taxed separately.

The tax consolidation agreement between EDF and the subsidiaries included in the tax group requires EDF to reimburse loss-making subsidiaries for the tax saving generated by their losses, as and when the entities concerned make taxable profits, in compliance with the standard rules for use of taxable losses.

The Company at the head of the tax group, EDF, recorded an income tax receivable of €406 million for 2020 (income tax receivable of €(605) million for 2019).

The breakdown is as follows:

- tax receivable of €435 million on the 2020 taxable loss (before exceptional items);
- tax charge of €(230) million on the exceptional result;
- tax receivable of €201 million corresponding to adjustments resulting from the tax consolidation.

15.3 Deferred taxes

Deferred taxes are not recognised in EDF's individual financial statements. Deferred taxes result from differences between the accounting bases and tax bases of items. They generally arise as a result of timing differences in the recognition of income and expenses:

- deferred tax assets reflect expenses which will be tax deductible in future years or losses carried forward which will reduce taxable income in the future;
- deferred tax liabilities reflect either advance tax deduction of future accounting expenses or accounting revenues that will be taxable in future years and will increase taxable income in the future.

EDF SA, as head of the tax group, includes tax losses generated at Group level in its deferred tax positions.

Changes in the basis for deferred taxes are as follows:

(in millions of euros)	31/12/2020	31/12/2019	Variation
1. Timing differences generating a deferred tax asset			
● Non-deductible provisions [(1)]	(16,589)	(14,704)	(1,885)
● Financial instruments and unrealised exchange gains	(4,717)	(2,624)	(2,093)
● Other	(529)	(595)	66
Total deferred tax assets subject to the standard rate	**(21,835)**	**(17,923)**	**(3,912)**
2. Timing differences generating a deferred tax liability			
● Financial instruments and unrealised exchange losses	2,224	2,256	(32)
● Other	2,678	2,547	131
Total deferred tax liabilities subject to the standard rate	**4,902**	**4,803**	**99**
● Capital gains not yet taxed	-	-	-
● Provisions for losses taxable at 15%	(25)	(15)	(10)
Total deferred tax assets subject to the reduced rate	**(25)**	**(15)**	**(10)**
BASIS FOR DEFERRED TAXES	**(16,958)**	**(13,135)**	**(3,823)**
Net future tax asset at standard rate [(2)]	4,510	3,369	1,141
Net future tax asset at reduced rate	4	2	2

(1) Mainly concerning post-employment benefits for personnel. In 2020 these provisions also include unrealised tax savings resulting from the future deductibility of expenses whose deductibility is temporarily being questioned in ongoing tax litigations (see note 14).

(2) Applying a corporate income tax rate of 25.82% to long-term timing differences.

Balance sheet

Note 16 Gross values of intangible and tangible fixed assets

(in millions of euros)	Gross value at 31/12/2019	Increases	Decreases	Gross value at 31/12/2020
Software	2,109	309	34	2,384
Other	282	5	2	285
Intangible assets	**2,391**	**314**	**36**	**2,669**
Land	117	4	2	119
Buildings	11,613	450	68	11,995
Nuclear power plants [1]	61,160	4,027	1,750	63,437
Machinery and plant other than networks	13,410	314	317	13,407
EDF-owned networks	1,071	54	-	1,125
Other	1,722	151	135	1,738
Property, plant and equipment owned by EDF [2]	**89,093**	**5,000**	**2,272**	**91,821**
Land	48	-	-	48
Buildings	10,248	550	12	10,786
Machinery and plant other than networks	1,669	158	14	1,813
Concession networks	3,019	156	22	3,153
Other	20	-	-	20
Property, plant and equipment operated under concessions [3]	**15,004**	**864**	**48**	**15,820**
Tangible assets [4]	17,756	5,056	5,381	17,431
Intangible assets [4]	926	578	315	1,189
Advances and progress payments on orders	3,030	-	10	3,020
Assets in progress	**21,712**	**5,634**	**5,706**	**21,640**
TOTAL INTANGIBLE AND TANGIBLE FIXED ASSETS [5]	**128,200**	**11,812**	**8,062**	**131,950**

(1) The change in the amount of nuclear power plants in 2020 is mainly explained by derecognition of assets related to Fessenheim following permanent closure of the plant in the first half of 2020.

(2) Property, plant and equipment owned by EDF include the €1,224 million impact of 35 back-up diesel facilities commissioned in 2019, and the €645 million impact of a further 20 back-up diesel facilities commissioned in 2020, in line with the timetable approved by the ASN.

(3) Property, plant and equipment operated under concessions concern the Island Energy Systems public electricity distribution concessions, and hydropower concessions. The newly-commissioned Romanche-Gavet hydropower plant in the Isère region of south-east France is included in this category at the amount of €408 million (see note 2.3).

(4) Investments during the year mainly concern equipment for existing power plants under the Grand Carénage programme. Intangible assets in progress include studies currently being conducted for the EPR 2 project, amounting to €538 million at 31 December 2020 (see note 3.1). The estimated impact of the Covid-19 pandemic on investments for the year is €(113) million.

*(5) The capitalised value of the Flamanville 3 EPR project in the financial statements at 31 December 2020 is €11,830 million * (€11,570 million in tangible assets in progress and €260 million in assets commissioned). In addition to the construction cost, this amount includes an inventory of spare parts and capitalised amounts totalling €466 million for related projects (notably the initial comprehensive inspection and North Area development), and €691 million of pre-operating expenses and other tangible assets related to the Flamanville project, giving a total construction cost at historical value of €10,672 million. Depreciation and amortisation recognised at 31 December 2020 in respect of assets in operation amounts to €78 million.*

In its report of July 2020 on EPR technology, the French Court of Auditors (Cour des Comptes) stated that by its calculations, in addition to the construction cost of €12.4 billion (in 2015 euros) announced by EDF, there will be further costs that could reach €6.7 billion (in 2015 euros), including €4.2 billion of interest expenses which are not capitalised under French GAAP. As stated above, other capitalised project costs amount to €1.2 billion at 31 December 2020. The additional costs resulting from the necessary repairs to the main secondary circuit welds at the Flamanville 3 EPR are abnormal costs that cannot be included in the production cost of an asset. They are recorded in expenses at the amount of €409 million in 2020, comprising €383 million of services and other purchases used (see note 8 (3)) and €26 million of personnel expenses (see note 10).

* Interest is not capitalised in the parent company financial statements.

Note 17 Depreciation, amortisation and impairment of intangible and tangible fixed assets

(in millions of euros)	Cumulative amount at 31/12/2019	Increases	Decreases	Cumulative amount at 31/12/2020
Software	1,175	283	32	1,426
Other	130	12	2	140
Intangible assets	**1,305**	**295**	**34**	**1,566**
Land and buildings	7,576	344	62	7,858
Nuclear power plants *	41,534	2,895	2,271	42,158
Machinery and plant other than networks	8,997	638	327	9,308
EDF-owned networks	532	31	-	563
Other	1,133	143	124	1,152
Property, plant and equipment owned by EDF	**59,772**	**4,051**	**2,784**	**61,039**
Land and buildings	6,618	146	10	6,754
Machinery and plant other than networks	1,084	33	13	1,104
Concession networks	1,264	85	21	1,328
Other	10	1	-	11
Property, plant and equipment operated under concessions	**8,976**	**265**	**44**	**9,197**
Tangible assets in progress	**94**	**25**	**35**	**84**
TOTAL DEPRECIATION, AMORTISATION AND IMPAIRMENT	**70,147**	**4,636**	**2,897**	**71,886**

* *The change in depreciation of nuclear power plants in 2020 is mainly explained by derecognition of assets related to Fessenheim following the plant's permanent closure in the first half of 2020, and the effect of the change in real discount rate at 31 December 2020 on impairment of assets associated with the provisions on those plants.*

17.1 Impairment tests on assets

Due to the integrated management and interdependence of the different generation facilities that make up EDF's fleet (nuclear, thermal and hydropower plants), independently of their maximum technical capacities, EDF considers the entire fleet as a single CGU.

Even when there is no indication of any loss of value, an impairment test is performed due to the highly significant value of this CGU in the financial statements and its substantial exposure to market prices since the "yellow" and "green" regulated tariffs were discontinued on 1 January 2016.

The recoverable value of the generation fleet is estimated by discounting future cash flows under the Company's usual methodology, described in note 1.6, over the assets' useful life, using an after-tax WACC of 5.2% at 31 December 2020. For nuclear assets currently in operation, EDF's benchmark model assumes that the useful life is 50 years, in line with its industrial strategy. It also incorporates the proposals for early shutdown of two 900MW nuclear reactors, as set out in France's multi-year energy plan.

The impairment test takes into consideration the latest forecasts concerning Flamanville 3 (see note 2.2.1), which adjusted the project schedule, setting the fuel loading date in late 2022, and revised the estimated construction cost to €12.4 billion (in 2015 euros), an increase of €1.5 billion from the previous estimate, mainly caused by exceptional additional costs for repairing penetration welds. The test assumes that these additional costs will be mainly included in operating expenses.

The year-end impairment test, like the test at 30 June 2020, indicates that the recoverable value is lower than at 31 December 2019, but the headroom over the book value remains significant. As well as the unfavourable macro-economic environment (long-term and medium-term price scenarios, WACC), calculation of the recoverable value notably includes revised assumptions for electricity output and the higher cost of the *Grand Carénage* programme (particularly as a result of the Covid-19 pandemic), in line with announcements made by EDF, and conversely the favourable effects of the national recovery plan on generation taxes.

The key assumptions in the test still concern the useful life of nuclear assets, the long-term price scenario, the discount rate, changes in costs and investments, and the capacity revenue. Each of these assumptions was subjected to sensitivity analyses and the results did not call into question the existence of a positive difference between the book value and recoverable value.

Note 18 Financial assets

18.1 Change in financial assets

(in millions of euros)	Cumulative value at 31/12/2020	Cumulative value at 31/12/2019
Investments [1]	60,006	59,479
Receivables related to investments	51	53
Investment securities [2]	24,347	22,350
Other investments	199	273
CSPE receivable [3]	-	684
Loans to subsidiaries and other financial assets [4]	16,422	12,026
Total financial assets, gross	**101,025**	**94,865**
Impairment of investments and related receivables	(712)	(578)
Impairment of investment securities [5]	(293)	(220)
Total impairment	**(1,005)**	**(798)**
TOTAL FINANCIAL ASSETS, NET	**100,020**	**94,067**

(1) The change in investments essentially corresponds to:

- *subscription to the capital increase by EDF Pulse Croissance Holding (€127 million);*
- *new investments by EDF Invest, including:*
  - *subscription to the capital of C72 (which holds Energy Assets Group (EAG)) (€178 million),*
  - *subscription to the capital of C76 (which holds a wind farm and a solar power plant in the United States) (€64 million, see note 38.2.5),*
  - *subscription to the capital of C80 (which holds a wind farm in Canada) (€74 million, see note 38.2.5),*
  - *subscription to the capital of C81 (which holds wind farms in Portugal) (€48 million, see note 38.2.5),*
  - *subscription to the capital of C66 (which holds a real estate property in Germany) (€25 million),*
  - *subscription to the capital of C78 (which holds a real estate property in France) (€18 million).*

At 31 December 2020, the 75.5% investment in Framatome is stated at the value of €2,028 million including acquisition expenses.

(2) Changes in investment securities correspond mainly to acquisitions and sales of dedicated assets over the period, which generated net gains of €780 million in 2020 (see note 14). These gains are reinvested in the dedicated asset portfolio.

(3) This receivable consisted of the balance of the accumulated shortfall in the Contribution to the Public Electricity Service (CSPE) at 31 December 2015 and the costs of bearing that shortfall. Reimbursements received during 2020 amount to €690 million including interest (€1,399 million in 2019) (see note 3.5), in line with the schedule published in the ministerial orders of 13 May 2016 and 2 December 2016, made in application of Article R. 121-31 of the French Energy Code. At 31 December 2020, EDF's financial receivable was fully repaid by the State.

(4) Loans to subsidiaries at 31 December 2020 total €16,378 million, including €10,877 million for EDF International, €2,083 million for EDF Renewables, €1,331 million for Dalkia, €931 million for Enedis and €643 million for PEI.

(5) The change in this item is mainly due to less favourable developments on the financial markets in 2020 than 2019, leading to recognition of impairment on investment securities and other investments during the year (see note 13).

18.2 Subsidiaries and investments of at least 50% of capital

(in millions of euros)	Gross book value of shares owned	Impairment recorded at 31/12/2020	% capital owned	Equity 2019	Net income 2019	Dividends received in 2020	Sales 2019
I. Subsidiaries							
● Holding companies							
EDEV	6,891	-	100	6,366	76	72	n.a.
EDF International	25,930	-	100	18,042	(655)	-	1
EDF Production Electrique Insulaire SAS	561	-	100	1,048	142	94	839
EDF Holding SAS	1,950	-	100	2,588	477	443	-
Société C3	11,196	-	100	11,483	157	149	-
EDF Immo	1,361	-	100	1,488	76	72	-
EDF Group Support Services	n.a.	-	100	2	1	1	161
CTE*	2,705	-	50.1	5,298	313	184	-
C45	99	9	100	99	10	10	-
EDF Nam Theun Holding	437	-	100	428	15	22	-
C73	143	12	100	143	n.a.	8	-
C74	123	12	100	123	n.a.	9	-
Other companies	2,559	265	100	1,785	(44)	152	-
● Industrial and commercial companies							
France							
Centrale Électrique Rhénane de Gambsheim	3	-	50	10	-	-	6
Dalkia France	967	140	99.9	446	(63)	-	2,207
Enedis	2,700	-	100	5,441	698	508	14,479
Framatome	2,028	-	75.5	2,549	132	47	2,159
Edvance	12	-	80	25	10	4	501
Other countries							
Emosson	14	14	50	129	-	-	32
Rheinkraftwerk Iffezheim (RKI)	3	-	50	97	3	-	16
Forces Motrices du Chatelôt	n.a.	-	50	8	n.a.	n.a.	4
● Other entities (GIE EIFER)	**130**	**125**	-	-	-	-	-
TOTAL I	**59,812**	**577**				**1,775**	

n.a.: not applicable (less than €500,000).
** CTE is the company that owns 100% of RTE.*

18.3 Subsidiaries and investments under 50% of capital

(in millions of euros)	Gross book value of shares owned	Impairment recorded at 31/12/2020	% capital owned	Equity 2019	Net income 2019	Dividends received in 2020
I. Subsidiaries						
Total I Carried forward	**59,812**	**577**				**1,775**
II Investments						
II.1 Companies in which EDF has an interest of between 10% and 50%:						
● **Industrial and commercial companies**						
France						
Trimet France	130	79	35	261	4	-
Dalkia Investissements	63	56	49.9	15	2	-
Total II.1	**193**	**135**				**-**
II.2 Companies in which EDF has an interest of less than 10%:						
Other companies	-	-	-	-	-	-
Other countries						
Forces Motrices de Mauvoisin	1	-	10	111	5	n.a.
Total II.2	**1**	**-**				**-**
Total II	**194**	**135**				**-**
Total subsidiaries and investments, gross	**60,006**	**712**				**1,775**
TOTAL SUBSIDIARIES AND INVESTMENTS, NET	**59,294**					

n.a.: not applicable (less than €500,000).

18.4 Investment securities portfolio

	At start of year			At year-end		
(in millions of euros)	Gross book value	Net book value	Fair value	Gross book value	Net book value	Fair value
VALUE OF INVESTMENT SECURITIES	**22,350**	**22,246**	**24,816**	**24,347**	**24,195**	**27,148**

At 31 December 2020, the net value of the investment securities portfolio comprises €24,195 million of dedicated assets.

18.5 Treasury shares

On 29 July 2020 the Company's Board of Directors decided to cancel 3,697,507 treasury shares reserved for this objective, with effect from 30 September 2020, allocating the difference between the repurchase value and nominal value of the cancelled shares to equity.

This decision follows introduction of the Company's share repurchase programme authorised by the General Shareholders' Meeting of 16 May 2019 for a duration of 18 months. A liquidity contract exists for this programme, as required by the French market regulator AMF in decision AMF 2018-01 of 2 July 2018.

The Chairman and CEO, acting by delegation of the Board of Directors, decided on 23 December 2019 to proceed under the share repurchase programme authorised by the General Shareholders' Meeting to reassignment of 3,646,913 EDF shares initially assigned to the liquidity contract, and 50,594 shares assigned to an Employee-reserved Offering of 2007, which is now an obsolete purpose. A total of 3,697,507 shares were thus assigned to the objective of a capital reduction by cancellation of those shares.

This operation resulted in cancellation of 3,646,913 shares included in investment securities, for the amount of €36 million, and 50,594 shares included in marketable securities (see note 21), for the amount of €2 million, giving a total cancellation of €38 million, charged to the Company's equity (see note 24).

	31/12/2019			Change in 2020*	31/12/2020		
(in millions of euros)	Gross value	Impairment	Net value		Gross value	Impairment	Net value
TREASURY SHARES	**61**	**(14)**	**47**	**(37)**	**10**	**-**	**10**

* *Including €(36) million relating to the treasury share cancellation described above.*

At 31 December 2020, a total 830,000 treasury shares are included in "investment securities" at the net value of €10 million.

18.6 Financial loans and receivables related to investments

(in millions of euros)	Liquidity < 1 year	1-5 years	> 5 years	Gross value at 31/12/2020	Gross value at 31/12/2019
Receivables related to investments	2	-	49	51	53
CSPE receivable	-	-	-	-	684
Loans to subsidiaries and other financial assets	1,535	13,579*	1,308	16,422	12,026
FINANCIAL LOANS AND RECEIVABLES RELATED TO INVESTMENTS	**1,537**	**13,579**	**1,357**	**16,473**	**12,763**

* *Including €9.95 billion of loans to EDF International, notably corresponding to termination of drawings on credit lines maturing in 2022 and 2023.*

Note 19 Inventories and work-in-progress

(in millions of euros)	31/12/2020 Gross value	Provisions	Net value	31/12/2019 Gross value	Provisions	Net value
Nuclear fuel	8,322	(33)	8,289	8,332	(4)	8,328
Other raw materials	265	(32)	233	116	(20)	96
Other supplies [1]	1,963	(236)	1,727	1,533	(221)	1,312
Work-in-progress and other inventories [2]	292	-	292	50	-	50
TOTAL INVENTORIES	**10,842**	**(301)**	**10,541**	**10,031**	**(245)**	**9,786**

(1) The increase in the inventory of Other supplies includes the increase in the stock of capacity certificates at 31 December 2020.
(2) The increase in the inventory of Work-in-progress and other inventories is mainly attributable to the stock of Energy Savings Certificates at 31 December 2020.

Note 20 Other current assets and cash

(in millions of euros)	Liquidity < 1 year	1-5 years	> 5 years	Gross value at 31/12/2020	Gross value at 31/12/2019
Advances on orders	**375**	**127**	**221**	**723**	**694**
● Trade receivables:					
Amounts billed	2,389	-	-	2,389	2,210
Unbilled receivables [1]	13,684	-	-	13,684	13,429
● Other operating receivables [2]	6,234	64	217	6,515	5,688
Total operating receivables	**22,307**	**64**	**217**	**22,588**	**21,327**
Cash instruments [3]	**823**	**368**	**623**	**1,814**	**2,672**
Cash and cash equivalents [4]	**5,364**			**5,364**	**4,714**
Prepaid expenses	**219**	**241**	**527**	**987**	**1,087**
TOTAL CURRENT ASSETS	**29,088**	**800**	**1,588**	**31,476**	**30,494**

(1) Mainly receivables for energy supplied and not billed in 2020.
(2) Including €3,480 million of receivables on the State related to taxes other than income taxes, and €1,974 million receivable in compensation for public energy service charges (CSPE) (€1,647 million in 2019).
(3) Unrealised gains on foreign exchange instruments.
(4) At 31 December 2020, cash and cash equivalents include €821 million resulting from the transfer of bonds to several banks under repurchase agreements, with recognition of a corresponding financial liability (see note 33 (2)).

Note 21 Marketable securities

EDF has changed the presentation of the marketable securities table for greater clarity. This change, which is applied retrospectively to the comparative figures for 2019, involves grouping bonds in foreign currencies (€1,919 million at 31 December 2020 and €2,687 million at 31 December 2019) and bonds in euros into a single line, "Bonds", for both years presented. In 2019, bonds in foreign currencies were presented in the line "Accrued interest and other marketable securities".

(in millions of euros)	31/12/2020	31/12/2019	Variation
Treasury shares	-	2	(2)
Investment funds [1]	2,443	410	2,033
Short-term negotiable debt instruments in euros and foreign currencies [2]	1,738	3,318	(1,580)
Bonds [2]	8,830	10,893	(2,063)
Accrued interest and other marketable securities	54	70	(16)
Total gross value	**13,065**	**14,693**	**(1,628)**
Provisions	**(4)**	**(3)**	**(1)**
TOTAL NET VALUE	**13,061**	**14,690**	**(1,629)**

(1) The increase in Investment funds is principally explained by the short-term investment of some of the funds generated by the green bond issue (OCEANEs Vertes) until they are used in renewable energy investments (see note 2.4.1).

(2) The decrease in negotiable debt instruments and bonds is explained by the aim of reducing the credit risk and increasing liquid assets (sight deposits, investment funds) to cope with the consequences of the Covid-19 pandemic.

Note 22 Variation in cash and cash equivalents reported in the cash flow statement

(in millions of euros)	31/12/2020	31/12/2019	Variation
Marketable securities	13,065	14,693	(1,628)
Cash and cash equivalents	5,364	4,714	650
Sub-total in balance sheet assets	**18,429**	**19,407**	**(978)**
Euro investment funds	(2,443)	(410)	(2,033)
Negotiable debt instruments (euro) maturing after 3 months	(937)	(1,068)	131
Negotiable debt instruments (non euro) maturing after 3 months	(801)	(2,250)	1,449
Bonds	(8,830)	(10,893)	2,063
Treasury shares	-	(2)	2
Accrued interest	(54)	(70)	16
Marketable securities included in financial assets in the cash flow statement	**(13,065)**	**(14,693)**	**1,628**
Cash advances to subsidiaries (cash pooling agreements) included in "Other operating receivables" in the balance sheet	-	-	-
Cash advances from subsidiaries (cash pooling agreements) included in "Other operating liabilities" in the balance sheet	(5,620)	(4,794)	(826)
Cash and cash equivalents, closing balance in the cash flow statement*	**(256)**	**(80)**	**(176)**
Elimination of the effect of currency fluctuations			102
Elimination of net financial income on cash and cash equivalents			(37)
NET VARIATION IN CASH AND CASH EQUIVALENTS IN THE CASH FLOW STATEMENT*			**(111)**

* *See the Cash flow statement.*

As of 2018, the cash positions of all subsidiaries in the cash flow statement are classified by reference to criteria of autonomy.

An entity is considered non-autonomous when it is a holding company, generates the majority of its sales with EDF group entities, or does not have the status of employer.

The main subsidiaries classified as non-autonomous are C2, C3, EDF Holding and EDF International, and the main subsidiaries classified as autonomous are Enedis, PEI, Sofilo and GGF.

In the cash flow statement, the cash positions of autonomous subsidiaries are presented as a deduction from "Cash and cash equivalents". The cash positions of non-autonomous subsidiaries are included in the components of the changes in working capital.

Note 23 Unrealised foreign exchange losses

Unrealised foreign exchange losses amount to €872 million at 31 December 2020, principally reflecting:

- unrealised losses caused by currency movements (essentially by the US dollar and the pound sterling) amounting to €576 million at 31 December 2020 (€994 million at 31 December 2019) on liabilities and receivables in foreign currencies, and currency hedging instruments;
- the balance at 31 December 2020 of realised gains and losses on the settlement of hedging instruments with the subsidiary EDF International, amounting to €296 million (€311 million at 31 December 2019). In accordance with the national chart of accounts, in application of the symmetry principle set out in Article 628-11, the net result (€311 million in 2019, no equivalent in 2020) is recognised in unrealised foreign exchange losses and transferred to expenses over the residual life of the hedged item, symmetrically to the accounting treatment of gains and losses on the hedged item. A €15 million expense was accordingly recognised in the 2020 financial result.

Note 24 Changes in equity

(in millions of euros)	Capital	Reserves and premiums	Retained earnings and interim dividends	Profit or loss for the financial year	Investment subsidies	Tax-regulated provisions	Total equity
At 31 December 2018	**1,505**	**19,494**	**6,900**	**1,591**	**166**	**6,056**	**35,712**
Allocation of 2018 net income	-	5	1,103	(1,108)	-	-	-
2019 profit	-	-	-	1,593	-	-	1,593
Capital increase of 18 June 2019	20	431	-	-	-	-	451
Dividend distribution	-	-	1	(483)	-	-	(482)
Capital increase of 17 December 2019	27	403	-	-	-	-	430
Interim dividend	-	-	(458)	-	-	-	(458)
Other changes	-	1	1	-	(7)	(121)	(126)
At 31 December 2019	**1,552**	**20,334**	**7,547**	**1,593**	**159**	**5,935**	**37,120**
Allocation of 2019 net income	-	5	1,588	(1,593)	-	-	-
2020 profit	-	-	-	222	-	-	222
Dividend distribution	-	-	-	-	-	-	-
Cancellation of treasury shares*	(2)	(22)	(14)	-	-	-	(38)
Interim dividend	-	-	-	-	-	-	-
Other changes	-	(1)	-	-	1	(149)	(149)
AT 31 DECEMBER 2020	**1,550**	**20,316**	**9,121**	**222**	**160**	**5,786**	**37,155**

* *Following the decision by EDF's Board of Directors 29 July 2020 to cancel 3,697,507 treasury shares via adjustment of equity. The amount concerned is €(38) million (see note 18.5).*

24.1 Share capital

At 31 December 2020, EDF's share capital amounts to €1,549,961,789.50 comprising 3,099,923,579 fully subscribed and paid-up shares with nominal value of €0.50, owned 83.68% by the French State, 14.94% by the public (institutional and private investors) and 1.36% by current and retired Group employees, with 0.02% held by EDF as treasury shares.

Under Article L. 111-67 of the French Energy Code, the French State must hold more than 70% of the capital of EDF at all times.

24.2 Dividends

The interim dividend for 2019 decided by EDF's Board of Directors on 19 November 2019 was €0.15 per share. It was paid out in the form of new shares (scrip option) or cash on 17 December 2019 and amounted to a total of €458 million. The French government opted for the scrip interim dividend for 2019. The cash dividend paid to shareholders who did not take the scrip option amounted to €27 million.

In the context of the Covid-19 pandemic, in response to the imperative needs for solidarity and responsibility to all the Company's stakeholders, it was decided at the General Shareholders' Meeting of 7 May 2020 that the interim dividend would be the only dividend for 2019.

Furthermore, EDF did not distribute an interim dividend in respect of the 2020 financial year.

Note 25 Additional equity

Additional equity at 31 December 2020 amounts to a net €11,473 million and consists of:

- perpetual subordinated bonds issued by EDF in January 2013 and January 2014 at the value of €4,336 million and €3,466 million respectively, net of redemptions;
- perpetual subordinated bonds issued by EDF in September 2018, valued at €1,250 million;
- perpetual subordinated bonds issued by EDF in November 2019, valued at €497 million;
- perpetual subordinated bonds issued by EDF in September 2020, valued at €2,081 million (€2,100 million nominal, net of a €19 million redemption premium) (see note 2.4.2).

This net amount includes the effects of foreign currency variations, redemption premiums and the related amortisation.

Payments to bearers of perpetual subordinated bonds amounted to €512 million in 2020 (€549 million in 2019). This expense is recorded in "Expenses on long-term financial liabilities after hedging" (see note 13).

Perpetual subordinated bonds

(in millions of currency units)

Issue date	Nominal amount	Currency	Redemption option	Rate
01/2013	1,250	EUR	12 years	5.38%
01/2013	1,250	GBP	13 years	6.00%
01/2013	2,098	USD	10 years	5.25%
01/2014	1,500	USD	10 years	5.63%
01/2014	267	EUR	8 years	4.13%
01/2014	1,000	EUR	12 years	5.00%
01/2014	750	GBP	15 years	5.88%
09/2018	1,250	EUR	6 years	4.00%
11/2019	500	EUR	8 years	3.00%
09/2020	850	EUR	6.5 years	2.88%
09/2020	1,250	EUR	10 years	3.38%

Note 26 Special concession liabilities

(in millions of euros)	31/12/2020	31/12/2019
Value in kind of assets	106	106
Revaluation difference	790	815
Additional depreciation	324	280
Rights in hydropower concession assets	**1,220**	**1,201**
Value in kind of assets	1,918	1,839
Unamortised financing by the operator	(1,219)	(1,157)
Amortisation of grantor financing	354	344
Contributions received for concessionary plant assets under construction	9	7
Rights in public distribution concession assets*	**1,062**	**1,033**
TOTAL SPECIAL CONCESSION LIABILITIES	**2,282**	**2,234**

* *Rights in public distribution concession assets concern the Island Energy Systems (SEI) public electricity distribution concessions.*

Note 27 Provisions for risks

		Increases		Decreases			Other changes	
(in millions of euros)	31/12/2019	Operating [1]	Financial [2]	Utilisations [1] [3]	Reversals [1]	Financial		31/12/2020
Provisions for unrealised exchange losses [4]	768	-	28	-	-	(284)	-	512
Provisions for losses on contracts [3]	1,616	590	375	(259)	(89)	-	-	2,233
Provisions for other risks	304	130	-	(32)	(7)	-	-	395
PROVISIONS FOR RISKS	**2,688**	**720**	**403**	**(291)**	**(96)**	**(284)**	**-**	**3,140**

(1) See notes 6 and 11.2.

(2) The increase in the cost of unwinding the discount on provisions for losses on contracts is explained by the substantially lower discount rate compared to 31 December 2019, due to changes in the methods for determining discount rates (see note 28.5).

(3) The €242 million net increase to operating provisions for losses on contracts principally concern a long-term LNG purchase contract (€146 million) and a regasification service contract (€163 million).

(4) Provisions for unrealised exchange losses amount to €512 million at 31 December 2020 and principally concern the hybrid notes (€269 million) and other borrowings after hedging (€216 million). The amounts reversed from these provisions in 2020 mainly concern the hybrid notes (€272 million).

Note 28 Provisions related to nuclear generation – back-end of the nuclear cycle, plant decommissioning and last cores

The provisions established by EDF for the nuclear generation fleet principally result from the Law of 28 June 2006 on long-term management of radioactive materials and waste, and the associated implementing provisions concerning secure financing of nuclear expenses.

In compliance with the accounting principles described in note 1.15.1:

- EDF books provisions to cover all obligations related to the nuclear facilities it operates;
- EDF also holds dedicated assets for secure financing of long-term obligations (see note 38).

The calculation of provisions incorporates a level of risks and unknowns that depend on the operations concerned. The valuation of costs also carries uncertainty factors as described in note 1.2.2.

Details of changes in provisions for the back-end of the nuclear cycle, decommissioning and last cores are as follows:

		Increases		Decreases		Other changes [3]	
(in millions of euros)	31/12/2019	Operating [1]	Financial [2]	Utilisations [1]	Reversals [1]		31/12/2020
Provisions for spent fuel management	10,823	625	626	(744)	-	(8)	11,322
• *amount unrelated to the operating cycle*	*1,152*	*65*	*109*	*(14)*	-	*(15)*	*1,297*
• *amount outside the scope of the Law of 28 June 2006**	*1,019*	*41*	*51*	*(35)*	-	-	*1,076*
Provisions for waste removal and conditioning	805	6	46	(25)	-	(832)	-
Provisions for long-term radioactive waste management	10,531	101	1,016	(221)	-	1,873	13,300
Provisions for the back-end of the nuclear cycle	**22,159**	**732**	**1,688**	**(990)**	**-**	**1,033**	**24,622**
Provisions for the back-end of the nuclear cycle within the scope of the Law of 28 June 2006*	**21,140**	**691**	**1,637**	**(955)**	**-**	**1,033**	**23,546**
Provisions for the back-end of the nuclear cycle outside the scope of the Law of 28 June 2006*	**1,019**	**41**	**51**	**(35)**	**-**	**-**	**1,076**
Provisions for nuclear plant decommissioning	16,937	133	780	(157)	(24)	(180)	17,489
Provisions for last cores	2,624	-	94	(99)	-	92	2,711
Provisions for decommissioning and last cores	**19,561**	**133**	**874**	**(256)**	**(24)**	**(88)**	**20,200**
TOTAL PROVISIONS RELATED TO NUCLEAR GENERATION	**41,720**	**865**	**2,562**	**(1,246)**	**(24)**	**945**	**44,822**
Provisions related to nuclear generation within the scope of the Law of 28 June 2006*	**40,701**	**824**	**2,511**	**(1,211)**	**(24)**	**945**	**43,746**
Provisions related to nuclear generation outside the scope of the Law of 28 June 2006*	**1,019**	**41**	**51**	**(35)**	**-**	**-**	**1,076**

* *Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations (see below).*

(1) See notes 6 and 11.2.

(2) The discount effect comprises the €1,520 million cost of unwinding the discount, and the effects of the change of real discount rate in 2020, recognised via the income statement for provisions with no related assets (€1,042 million) (cost of unwinding the discount).

(3) Other changes mainly include:

- *the effects of the change of real discount rate at 31 December 2020 for provisions with related assets (€707 million);*
- *reclassification of €841 million previously included in provisions for waste removal and conditioning and €813 million previously included in provisions for nuclear plant decommissioning (corresponding to the cost of interim storage and processing of steam generators in a centralised facility) as provisions for long-term radioactive waste management, to ensure consistency with the most recent official breakdown of nuclear expenses in defined operations attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses.*

Concerning non-EDF installations:

- EDF, COGEMA (now Orano Recyclage) and the French Atomic Energy Commission *(Commissariat à l'énergie atomique* or CEA) signed an agreement in December 2004 which transferred the management and financing of final shutdown, decommissioning and waste recovery and reconditioning for the UP1 reprocessing facility at Marcoule to the CEA. In return, EDF paid the CEA a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs;
- EDF, AREVA and AREVA NC (now Orano Recyclage) signed two agreements in December 2008 and July 2010 defining the legal and financial terms for the transfer to AREVA NC of EDF's contractual obligations regarding its financial contribution to the dismantling of La Hague installations and the recovery and conditioning of waste. In application of those agreements, EDF paid Orano Recycle a one-time financial contribution covering its full share of the cost of outstanding operations, while remaining the owner of its final waste and bearing only the transport and storage costs.

28.1 Provisions for spent fuel management

EDF's currently adopted strategy with regards to the fuel cycle, in agreement with the French State, is to process spent fuel and to recycle the separated plutonium in the form of MO_X fuel (Mixed OXide of plutonium and uranium).

The quantities processed by Orano Recyclage at the request of EDF, totalling approximately 1,100 tonnes per year, are determined based on the quantity of recyclable plutonium in the reactors that are authorised to load MO_X fuel.

Consequently, provisions for spent fuel management cover the following services to be provided by Orano Recyclage:

- removal of spent fuel from EDF's generation centres, as well as reception and interim storage;
- processing, including conditioning and storage of recyclable matter.

The processing expenses included in these provisions exclusively concern spent fuel that can be recycled in existing facilities, including the portion in reactors but not yet irradiated.

Expenses are measured based on forecast physical flows at the year-end, with reference to the contracts with Orano Recyclage which define the terms for implementation of the framework agreement for the period 2008-2040. The most recent contract, signed on 5 February 2016, covers the period 2016-2023. These contracts contain price indexes that are revised annually.

In 2018, the Board of Directors approved resumption of recycling of uranium from reprocessing (which had been suspended in 2013 pending availability of a new industrial schema), with loading of the first fuel assemblies scheduled for 2023, subject to technical adaptations and the necessary authorisations from the Nuclear Safety Authority. The objective is to start recycling in certain 900MW units, and later in certain 1,300MW units. The corresponding contracts were signed with the respective suppliers in the second quarter of 2018. In 2020, EDF continued to monitor the plants' preparation trajectory with reference to those contracts and conducted tests of the interfaces between suppliers. The portion of the provision for spent fuel management relating to storage of uranium from reprocessing (€882 million) will be recovered once all the industrial, regulatory and economic conditions for resumption of uranium recycling have been fulfilled, but EDF has no control over fulfilment of some of these conditions.

This provision also covers long-term storage of spent fuel that cannot currently be recycled in existing industrial facilities or facilities under construction: plutonium fuel (MO_X) or uranium fuel derived from processing, and fuel from Creys-Malville and Brennilis until fourth-generation reactors become available. Dedicated assets are held in association with this provision, which is unrelated to the operating cycle as defined by the law (see note 38). The provision is founded on a scenario involving construction, managed by EDF (that will be the nuclear operator), of a centralised underwater storage site at La Hague. This project was presented during the public debate on the National Plan for Managing Radioactive Matter and Waste in 2019-2020, and will be subjected to a specific public consultation in 2021, organised by France's National Public Debate Commission (CNDP).

28.2 Provisions for long-term radioactive waste management

Following the reclassifications applied at 31 December 2020 as explained in note 28, provisions for long-term radioactive waste management concern the following future expenses:

- interim storage, removal and storage of radioactive waste packages resulting from spent fuel processing;
- direct storage, after long-term interim storage where relevant, of spent fuel that cannot be recycled in existing installations: specifically plutonium fuel (MO_X) or uranium fuel derived from enriched processing, and fuel from Creys-Malville and Brennilis;
- characterisation, processing, conditioning and interim storage of radioactive waste resulting from decommissioning and certain operating waste – these operations were previously covered by the provisions for nuclear plant decommissioning and provisions for waste removal and conditioning, and final storage of this radioactive waste;
- EDF's share of the costs of studies, construction, operation and maintenance, shutdown and surveillance of existing and future storage centres.

The volumes of waste concerned by provisions include existing packages of waste and all waste to be conditioned, resulting in particular from plant decommissioning or spent fuel processing at La Hague (comprising all fuel in reactors at 31 December, irradiated or otherwise). These volumes are regularly reviewed, in keeping with the data declared for the purposes of the national waste inventory undertaken by ANDRA.

The provisions for long-term radioactive waste management break down as follows:

(in millions of euros)	Storage centre	31/12/2020	31/12/2019
Very low-level and low and medium-level waste	Very low-level waste: Morvilliers (Andra) – Low and medium-level waste: Soulaines (Andra)	2,856	1,561
Long-lived low-level waste	Project under examination: Soulaines (Andra)	365	330
Long-lived medium and high-level waste	Geological storage centre: the Cigéo project	10,079	8,640
PROVISION FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT		**13,300**	**10,531**

Very low-level and low and medium-level waste

Very low-level waste and low and medium-level waste comes from nuclear facilities in operation or in the process of being decommissioned:

- very low-level waste mainly comes from nuclear plant decommissioning, and generally takes the form of metals (large components, piping, support structures, etc.) or rubble (concrete, earth, etc.). This type of waste is stored at surface level at the Morvilliers storage centre managed by ANDRA;
- low and medium-level waste (gloves, filters, resins, materials, etc.) is stored at surface level at the Soulaines storage centre managed by ANDRA.

The cost of removing, processing and storing short-lived waste (very low-level and low and medium-level) is assessed on the basis of current contracts with transporters, ANDRA for operation of the existing storage centres and the costs of the Cyclife France plant for waste processing.

In 2019, the inventory assumptions were updated by a time series analysis of past waste removal and better characterisation of future volumes, leading to a €206 million increase in the provision (with an unfavourable effect of €132 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

In 2020, the assumptions concerning the shares of costs were reassessed, to reflect the long-term distribution between the three producers concerned of fixed storage costs for very low-level waste and low and medium-level waste. All the effects of this cost-share updating work have led to a €179 million increase in the provision (with an unfavourable effect of €50 million on the income statement, while the rest of the change was recognised *via* adjustments to fixed assets).

Since 31 December 2020, following the reclassifications presented in note 20 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the treatment, conditioning and interim storage of waste; many of these operations were previously included in the provisions for nuclear plant decommissioning and waste removal and conditioning (reclassification of €979 million applied at 31 December 2020).

Finally, for very low-level waste, in February 2020, following the public debate of 2019-2020 concerning the French National Plan for the Management of Radioactive Materials and Waste (PNGMDR), the conclusions of the Ministry for the Ecological and Inclusive Transition and the ASN pave the way for a change in regulations that would allow recycling of very low-level metal waste after processing: "The Government will make changes to the regulatory framework applicable to the management of very low-level waste, in order to introduce a new possibility of targeted exceptions, allowing recycling, after fusion and decontamination and on a case-by-case basis, of very low-level radioactive metallic waste." A change to the regulations had been proposed by the General Risk Prevention Department (DGPR) and submitted to public consultation.

Long-lived low-level waste

Long-lived low-level waste belonging to EDF essentially consists of graphite waste from the ongoing decommissioning of the former UNGG (natural uranium graphite gas-cooled) reactors.

As this waste has a long lifetime but is lower-level than long-lived medium and high-level waste, specific subsurface storage requirements apply under the French Law of 28 June 2006.

Following the initial geological investigations, in July 2015 ANDRA remitted a report on the proposed storage centre for long-lived low-level waste on a site located in the Soulaines region (Aube) in France. This report was submitted to the ASN for its opinion. Uncertainties remain about the site's capacity to accommodate all of the waste included in the baseline inventory of the long-lived low-level waste storage facility. Further studies were planned under the 2016-2018 period of the National Plan for the Management of Radioactive Materials and Waste (PNGMDR), concerning both the feasibility of this storage centre and the search for additional waste management solutions. The ASN's opinion on management of this waste, issued on 6 August 2020 after the work done over the period 2016-2018, and the orientations proposed by the head of the PNGMDR in the current elaboration phase of the fifth edition of the PNGMDR, set a horizon of 2023 for definition by ANDRA of several reference management scenarios, and of the needs for complementary concepts and the production of a file (equivalent to a Summary Preliminary Plan or avant-projet sommaire – APS) presenting the technical and safety options selected for storage of long-lived low-level waste.

Long-lived medium and high-level waste

Long-lived medium and high-level waste essentially comes from processing of spent fuel, and to a lesser extent waste resulting from nuclear plant decommissioning (metallic components that have been inside the reactor).

The French Law of 28 June 2006 requires reversible storage in deep geological layers for this type of waste.

The provision established for long-lived medium and high-level waste is the largest component of provisions for long-term radioactive waste management.

Until June 2015 the gross value and disbursement schedules for forecast expenses were based on a scenario of industrial geological waste storage, following conclusions presented in the first half of 2005 by a working group formed under supervision of the State involving representatives of the administrations concerned, ANDRA and the producers of waste (EDF, Orano, CEA). EDF applied a reasonable approach to information supplied by this working group, leading to a benchmark cost, for storage of waste from all producers, of €14.1 billion under the economic conditions of 2003 (€20.8 billion under 2011 economic conditions, based on the 2011 inventory).

In 2012 ANDRA carried out preliminary conceptional studies for the Cigéo geological storage project.

On this basis, ANDRA drew up figures which, in compliance with the Law of 28 June 2006, were subjected to a consultation process with waste producers started in late 2014 by the French Department for Energy and Climate (Direction Générale de l'Énergie et du Climat or DGEC). In April 2015 EDF and the other producers sent the DGEC their comments on ANDRA's report and a joint estimation of the target Cigéo storage cost due to divergences in the valuation of technical optimisations and their induced effects. All this information was included, together with the ASN's opinion, in a report submitted to the Minister for Ecology, Sustainable Development and Energy.

On 15 January 2016 the Ministry of Ecology, Sustainable Development and Energy issued a ministerial order setting the target cost for the Cigéo storage project at €25 billion under 2011 year-end economic conditions. The cost as defined constitutes an objective to be met by ANDRA, in compliance with safety standards set by the ASN, working in close liaison with the operators of nuclear installations.

In application of this ministerial order, the cost of the Cigéo project will be regularly updated, at least at each key milestone in the course of the project's development (authorisation to create the facility, commissioning, end of the "pilot industrial phase", safety reviews) in accordance with the opinion of the ASN.

In April 2016 ANDRA sent the ASN a safety option report (DOS). The law of 11 July 2016 clarified the concept of reversibility.

On 11 January 2018, the ASN issued its opinion on the DOS. It considered that the Cigéo project had reached satisfactory overall technological maturity at that stage. This opinion included a requirement for examination of alternatives to the proposals for storage of bituminous waste at Cigéo. A group of experts appointed by the DGEC in September 2018 to draw up a report on current bituminous waste management concluded in September 2019 that various options were feasible (storage or neutralisation) but stressed the importance of continuing the studies in order to identify the most appropriate option.

Detailed design studies for Cigéo are currently being finalised by ANDRA. The Detailed Design Review by a group of independent experts, organised at the request of the DGEC, reported its conclusions in October 2020. While issuing a generally favourable opinion for the ANDRA's submission, the group made a certain number of recommendations for finalisation of the detailed design studies and the application for authorisation to create the centre, calling for closer involvement of EDF, Orano and the CEA on these matters.

Under the schedule prepared by ANDRA, the application to develop Cigéo (classified as a basic nuclear facility) is now due to be made in 2021, with a corresponding extension for obtaining authorisation. Producers are still currently working on the hypothesis that the first waste packages would be received in 2031.

On 3 August 2020, ANDRA filed an application with the Ministry for the Ecological Transition for a *déclaration d'utilité publique* (DUP) officially recognising the public utility of the Cigéo storage centre. After examination by the government departments, this application will give rise to a public debate expected to take place in the second quarter of 2021. Publication of the DUP decree, which would automatically confer compatibility on the planning documents, is expected in late 2021.

Finally, the French finance law for 2021, published in the Journal officiel of 30 December 2020, includes a change to the tax treatment of this project (based on storage tax instead of the standard tax regime). The associated measures remain to be defined and managed by the Government to prevent any cost increase for the Cigeo project.

Also, since 31 December 2020, following the reclassifications presented in note 28 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, the provision established for very low-level and low and medium-level waste also covers the conditioning and interim storage of low and medium-level waste at the ICEDA storage facility (*installation de conditionnement et d'entreposage des déchets activés*). This facility, constructed at the Bugey power plant, received its first waste packages in September 2020 after the ASN authorised its commissioning on 28 July 2020. These nuclear expenses were previously covered by the provisions for waste removal and conditioning (the reclassification at 31 December 2020 concerned an amount of €675 million).

28.3 Decommissioning provisions for nuclear power plants

EDF bears full technical and financial responsibility for decommissioning of the basic nuclear facilities (*installations nucléaires de base*, INB) it operates. The final shutdown and decommissioning process is governed by legal provisions and regulations set out in Articles L. 593-25 to L. 593-20 and R. 593-65 to R. 593-74 in the Environmental Code. It involves the following operations for each INB:

- a definitive shutdown declaration, to be made at least two years prior to the planned shutdown date;
- since the Energy Transition Law of 17 August 2015, the final shutdown of the INB, which takes place during its operating phase, is considered separately from dismantling, as a notable change of lesser importance (simply requiring a declaration by the operator to the Minister and the ASN);
- a dismantling plan compiled by the operator and sent to the Minister in charge of Nuclear Safety, which after examination by the authorities and a public inquiry, leads to a decree prescribing dismantling that authorises the start of dismantling operations;
- key-stage progress reviews submitted for the ASN's approval, with a safety file specific to the dismantling operations to be performed;
- an internal control process concerning significant changes introduced by the operator in the case of operations that must be declared to or approved by the ASN;
- finally, once these operations are complete, declassification of the facility, which removes it from the legal regime governing basic nuclear facilities.

The decommissioning scenario adopted by EDF complies with France's Environmental Code, which requires as short a period as possible to elapse between final shutdown and dismantling in economically acceptable conditions and in compliance with the principles laid down in Article L. 1333-1 of the Public Health Code (radioprotection) and section II of Article L. 110-1 of the Environmental Code (protection of the environment). The intended end-state is industrial use: the sites will be restored to their original condition and will be reusable for industrial facilities.

The ongoing operations concern plants that were constructed and operated before the nuclear fleet currently in operation, known as "first-generation" plants, and the Superphenix plant and Irradiated Materials Workshop. These operations cover four different reactor technologies: a heavy water reactor (Brennilis), a sodium-cooled fast-neutron reactor (the Superphenix at Creys-Malville), natural uranium graphite gas-cooled (UNGG) reactors (at Chinon, Saint Laurent and Bugey) and a pressurised water reactor (PWR at Chooz). Each of them is a first for EDF, and apart from the PWR at Chooz, they concern reactor technologies for which there is little or no international experience. They therefore require development of new methods and technologies that are riskier than technologies for which feedback already exists. Decommissioning of the Chooz PWR is benefiting from past experience (essentially in the US and limited), but the plant has the specificity of being located in a cave, making this a unique operation, generating experience that is not immediately transposable and involves specific challenges.

The experience gained from dismantling the Chooz PWR will nonetheless improve the robustness of the studies and estimates of future decommissioning costs for the nuclear fleet currently in operation ("second-generation" plants). But so far, neither EDF nor any other operator has begun a decommissioning programme on a scale comparable to the current PWR fleet, and as a result the estimates include both opportunities and risks, especially associated with the scale effect.

At Fessenheim, the two pressurised water reactors were shut down definitively on 22 February 2020 and 30 June 2020 respectively, in accordance with the law and before the end of their technical operating life. The Consolidated Preliminary Plan (*avant-projet consolidé* or APC) was finalised in late 2018, with more in-depth studies and derisking of the Summary Preliminary Plan (*avant-projet sommaire* or APS). The dismantling plan was sent to the ASN in September 2019 together with the declaration of the permanent shutdown of this INB. The studies conducted in 2019 and 2020 focused on preparing the dismantling plan, which was sent to the ASN on 2 December 2020. After the filing date, the ASN will examine the documents for a period of 3 to 5 years.

The decommissioning provisions cover future decommissioning expenses as described above (excluding the cost of removing and storing waste, which is covered by the provisions for long-term waste management).

Details of changes in decommissioning provisions for nuclear power plants are as follows:

		Increases		Decreases		Other changes [2]	
(in millions of euros)	2019	Operating	Financial [1]	Utilisations	Reversals		2020
Provisions for decommissioning nuclear plants in operation	13,244	-	474	(19)	(24)	(900)	12,775
Provisions for decommissioning permanently shut-down nuclear plants	3,693	133	306	(138)	-	720	4,714
TOTAL DECOMMISSIONING PROVISIONS FOR NUCLEAR POWER PLANTS	**16,937**	**133**	**780**	**(157)**	**(24)**	**(180)**	**17,489**

(1) Cost of unwinding the discount and effects of changes in the net discount rate for provisions without related assets.

(2) Essentially reclassification of the decommissioning provision concerning the two Fessenheim reactors, from "Provisions for decommissioning nuclear plants in operation" to "Provisions for decommissioning permanently shut-down nuclear plants" following their final shutdown in the first half of 2020.

For nuclear power plants currently in operation (PWR pressurized water reactor plants with 900MW, 1,300MW and N4 reactors)

Until 2013, provisions were estimated based on a 1991 study by the French Ministry of Trade and Industry, which set an estimated benchmark cost for decommissioning expressed in €/MW, confirming the assumptions defined in 1979 by the PEON commission. These estimates were supported from 2009 by a detailed study of decommissioning costs conducted by EDF at the representative site of Dampierre (four 900MW units), and its results were corroborated by an intercomparison with the study carried out by consultants La Guardia, based mainly on the Maine Yankee reactor in the US.

In 2014 the Dampierre study was reviewed by EDF to make sure that the previous calculations were still valid in view of recent developments and experience, both internationally and internally. For this revision, the decommissioning provisions for plants in operation were based on costs resulting from the Dampierre study, in order to incorporate best estimates and experience from inside and outside France. This change of estimate had no significant impact on the level of provisions at 31 December 2014.

Between June 2014 and July 2015, an audit of dismantling costs for EDF's nuclear fleet currently in operation was conducted by specialised consulting firms, at the request of the French Department for Energy and Climate (Direction Générale de l'Énergie et du Climat or DGEC). On 15 January 2016 the DGEC published a summary of the audit report. It stated that although estimating the cost of decommissioning nuclear reactors is a demanding exercise due to relatively limited past experience, the prospects of changes in techniques, and the distant timing of the expenditure, overall, the audit confirmed EDF's estimate of decommissioning costs for its nuclear fleet currently in operation. The DGEC also made a number of recommendations to EDF following this audit.

In 2016, EDF revised the decommissioning estimate, in order to incorporate the audit recommendations and past experience gained from dismantling operations for first-generation reactors (particularly Chooz A).

A detailed analytical approach was used to revise this estimate, identifying all costs for the engineering, construction work, operation and waste processing involved in future decommissioning of reactors currently in operation. This led to figures based on detailed timetables for plant decommissioning. The approach adopted made it possible to explore more thoroughly the assessment of costs specific to the initial units of each series, estimated for each series based on transposition coefficients applied to the baseline costs for the initial 900MW unit, and the series and mutualisation effects, as these costs and effects are inherent to the fleet's size and configuration.

The natures of the principal series and mutualisation effects used to arrive at the estimate are explained below.

Series effects (effects of work for the first-of-a-kind site on the following sites of the same series) are mainly of two types:

- first, in a fleet using the same technology, many of the studies do not need to be repeated each time;
- second, in a fleet using the same technology, robots and tooling can be largely reused from one site to another.

Mutualisation effects (effects between units on the same site, whether in operation or being decommissioned) are of several different types:

- some of them relate to the fact that several reactors may share common buildings and facilities on the same site, and these buildings and facilities will not have to be dismantled twice;
- certain costs are not higher when two or four reactors are dismantled on the same site. This is usually the case for surveillance costs, common equipment, and the cost of maintaining safe operating conditions on the site.

Due to mutualisation effects, dismantling a pair of reactors on the same site costs less than dismantling two standalone reactors on two different sites. In France, unlike other countries, there are no single reactors but sites with two or four, and in one case six reactors.

Series and mutualisation effects reduce the estimated decommissioning cost by 10% and 6% respectively compared to an estimate that ignores these effects. Series and mutualisation effects vary depending on the series: they are greater when there are more units in a series (series effect) and more units on a site (mutualisation effect), leading to a combined effect (series and mutualisation effect) of over 16% for the 900MW series.

In particular, series and mutualisation effects explain why it is not appropriate simply to compare the average dismantling cost per reactor between the French fleet and other countries' nuclear fleets.

In contrast, the estimates only marginally reflect changes in productivity and the learning effect. The external audit of the decommissioning cost for the fleet currently in operation, ordered by the DGEC, considered that this approach resulted in a prudent estimation method.

For reasons of prudence, the estimate also includes an assessment of risks and uncertainties as follows:

- incorporation of uncertainties relating to each "elementary" block of costs, series effects, mutualisation effects, transposition coefficients and fleet expenses;
- incorporation of risks, corresponding to the completion risks (which are identifiable and quantifiable, but only contingent). These risks are currently being assessed in detail based on the initial 900MW unit (Fessenheim). Until the results are released, the financial impact of the risks and opportunities is included *via* a flat-rate increase.

The above method for assessing risks and uncertainties leads to an overall margin of some 16.5% for the whole fleet (20% for the first 900MW unit).

This approach, adopted in 2016, and its results were presented to the administrative authority and gave rise to further questions and discussions.

The results of this detailed approach led to limited changes overall in the cost estimate and the associated provisions at 31 December 2016, apart from the consequences of the change in the depreciation period for 900MW series plants (excluding Fessenheim) at 1 January 2016, and the effect of changes in discount rates at 31 December 2016, *i.e.*:

- an increase of €321 million in the estimated decommissioning costs and an increase of €334 million in the estimated cost of long-term management of long-lived medium-level waste;
- a decrease of €(451) million in the provision for plant decommissioning, and an increase of €162 million in the provision for long-term management of long-lived medium-level waste, with corresponding changes in the underlying assets.

After its revision in 2016, it was decided that the cost estimate would be reviewed annually. Reviews since 2017 have led to non-significant annual adjustments to this estimate.

EDF continues to confirm its analyses through an international intercomparison, taking care to identify and characterise a number of factors that could distort direct comparisons, for example differences in the scope concerned by the cost estimate, or national and regulatory contexts.

In 2020, in addition to reclassification of the amount concerning the Fessenheim plant to the provision for decommissioning of permanently shut-down plants, the following changes were made to the provisions for decommissioning of nuclear plants currently in operation:

- the scope of these provisions includes the cost of demolishing back-up diesel facilities commissioned for the *Grand Carénage* programme in 2020, resulting in a €23 million increase in the provision;
- as explained in note 3.1, the final adoption of France's multi-year energy programme (PPE) in April 2020 led to recognition in EDF's financial statements of the impact of the two early reactor shutdowns to take place in 2027 and 2028 before their fifth ten-year inspection. Nuclear provisions were re-estimated based on various possible shutdown scenarios, resulting in a €32 million increase in these provisions (€26 million of which concerned provisions for decommissioning of nuclear plants in operation) *via* an adjustment to balance sheet assets, as announced in note 3.1 to the financial statements at 31 December 2019;
- following the reclassifications presented in note 28 to ensure consistency with the most recent official breakdown of nuclear expenses attached to the amended ministerial order of 21 March 2007 on secure financing of nuclear expenses, an amount of €813 million corresponding to the cost of interim storage and processing of steam generators in a centralised facility was reclassified to provisions for long-term radioactive waste management.

Based on the estimates of the different types of cost, the benchmark cost to completion (in 2020 euros) for decommissioning of the first two 900MW units (Fessenheim) amounts to approximately €0.8 billion, giving an average of €0.4 billion per initial 900MW unit, compared to an average cost of €0.35 billion for the entire PWR fleet, including the series and mutualisation effects described above.

For permanently shut-down nuclear power plants

Except for the two reactors at the Fessenheim plant (for which provisions are estimated under the approach used for the PWR fleet in operation described above), decommissioning of shut-down reactors involves pilot operations corresponding to four different technologies, each with clear specificities: a PWR reactor at Chooz A (but located in a cave), UNGG (natural uranium graphite gas-cooled) reactors at Bugey, Saint-Laurent and Chinon, a heavy water reactor at Brennilis, and a sodium-cooled fast neutron reactor at Creys-Malville.

The decommissioning costs are based on contractor quotes, which take account of accumulated industrial experience, unforeseeable and regulatory developments, and the latest available figures. They have been revised annually since 2015. In 2015 the industrial decommissioning strategy for UNGG plants was totally revised. The previously selected strategy was based on a scenario involving "underwater" dismantling of caissons (UNGG reactor buildings) for four of the reactors, with direct graphite storage in a centre currently under examination by ANDRA (see note 28.2 "Long-lived low-level waste"). Several new technical developments showed that the alternative "in-air" dismantling solution for the caissons would improve industrial control of operations and was apparently more favourable in terms of safety, radioprotection and environmental impact. The Company therefore selected a new "in-air" dismantling scenario as the benchmark strategy for all six caissons. This scenario includes a consolidation phase, building on experience acquired from dismantling the first caisson before beginning work on the other five. The decommissioning phase will ultimately be longer than previously planned, leading to a higher estimated cost due to the induced operating charges.

Updating the industrial decommissioning scenario for permanently shut-down power plants, particularly UNGG plants, led to a €590 million increase in the provision at 31 December 2015.

The review of decommissioning provisions for permanently shut-down plants in 2016 led to non-significant adjustments, apart from one increase of €125 million for a specific installation (the Irradiated Materials Workshop at Chinon). In 2017 and 2018, this annual review gave rise to non-significant adjustments.

The amended industrial scenario for dismantling of the UNGG reactors in 2015 was presented to the ASN's commissioners on 29 March 2016. In 2018 the ASN issued its main questions and conclusions about the UNGG strategy file. A consensus was reached regarding "in-air" dismantling for all reactors, the usefulness of an industrial demonstrator, and the timetable for dismantling the first-of-a-kind reactor (Chinon A2), but discussions continued regarding the dismantling timetable for the other 5 reactors. EDF's proposed schedule allowed for significant experience-based adjustments (after dismantling the first reactor) before beginning almost simultaneous dismantling of the other 5 reactors. On 12 February 2019, EDF presented all the information justifying the Group's chosen timetable to the ASN's commissioners. The ASN then issued draft decisions that were submitted to public consultation between July and November 2019, setting the deadline for filing regulatory applications for authorisation of dismantling work, and the dismantling schedule to be included in the applications. In those draft decisions, the ASN acknowledged that the required operations are complex, and that EDF's proposed risk control strategy (industrial demonstrator, significant experience with a first reactor) is justified. However, it asked for work on the five reactors after the first-of-a-kind reactor to be brought forward slightly and begin no later than 2055.

In view of the ASN's draft decisions, the nuclear provisions were increased in 2019 by a total €108 million: €77 million for decommissioning provisions for permanently shut-down nuclear power plants and €31 million for provisions for long-term radioactive waste management (long-lived low-level waste, very low-level and low and medium-level waste).

The ASN's decisions concerning dismantling of UNGG reactors were published on 17 March 2020 and did not contradict the principles of the draft decisions of 2019. Consequently, the nuclear provisions for decommissioning of UNGG plants were not subjected to any particular reestimation in 2020, and they reflect the best estimate of the industrial and technical scenario.

In 2020, the annual review of the cost estimates for decommissioning of permanently shut-down plants led to a €45 million increase in provisions due to critical path delays following suspension of work during France's first lockdown phase, and a major unforeseen event associated with suspension of segmentation work on vessel internals at Chooz A. The costs for decontamination of civil engineering work were also updated, leading to a €43 million increase in provisions for the entire scope of permanently shut-down plants.

Finally, in accordance with its powers under Article 594-4 of the Environment Code, in June 2020 the DGEC commissioned an external audit of the valuation of dismantling operations for EDF's permanently shut-down nuclear facilities, conducted by a consortium of specialist firms. This audit began in December 2020 and will continue until July 2021.

At 31 December 2020, the gross amounts estimated under year-end economic conditions (amounts still to be spent) and the present value of those amounts are as follows, presented by type of reactor technology:

	31/12/2020	
(in millions of euros)	**Costs based on year-end economic conditions**	**Amounts in provisions at present value**
Pressurised water reactor – PWR – Chooz A	215	176
Pressurised water reactor – PWR – Fessenheim*	810	689
Natural uranium graphite gas-cooled reactors – UNGG – Bugey, Saint Laurent, Chinon	5,352	2,967
Heavy water reactor – Brennilis	321	276
Sodium-cooled fast neutron reactor – Superphenix at Creys Malville	557	494

* *Excluding interim storage and processing of steam generators.*

Provisions for decommissioning of permanently shut-down nuclear plants also cover dismantling costs for related facilities such as the APEC Fuel Storage Workshop at Creys-Malville and the BCOT Operational Hot Unit at Tricastin.

Compared to decommissioning costs for the PWR technology, the cost at completion (all costs both settled and remaining) for decommissioning of the other reactors is higher, to different extents depending on their specific characteristics:

- costs are around twice as high for Brennilis (completion cost of approximately €0.85 billion for one reactor) due to its compactness, the fact that the core is encased in concrete and thus difficult to access, the absence of a fuel pool, which complicates remote-controlled segmentation, and the presence of zircaloy (a fire hazard), meaning that segmentation work takes longer and must be more closely supervised;
- costs are around twice as high for UNGG reactors (completion cost of approximately €6.4 billion for six reactors), because they require removal of 20 times more material than a PWR due to their size, and contain graphite which is hard to access and requires special handling such that specific remote-controlled equipment must be developed;
- costs are around four times as high for Creys-Malville (completion cost of approximately €1.8 billion for one reactor), due to processing of sodium for which elimination is very sensitive, and the size of the facilities, especially the reactor (with a vessel 20 times bigger than the vessel of the 1,300MW PWR).

The following progress has been made on decommissioning work:

- Chooz A: the reactor was shut down in 1991 and nuclear dismantling began in 2007 after the dismantling decree was issued. The final stage of dismantling began in 2016 and involves segmentation, conditioning and removal of reactor vessel internals, followed by dismantling of the vessel itself. These operations are due to be completed in 2024. The dismantling decree requires them to be followed by a period of surveillance of the runoff water from the cave for twenty years, meaning that declassification of the facility would occur in 2047;
- UNNG reactors: these six reactors were shut down between 1973 and 1994 and received their dismantling decrees between 2008 and 2010 (except for Chinon A1 and A2). Fuel removal and circuit draining have been completed for all these reactors, and dismantling operations are in process for the conventional and nuclear buildings in the periphery of the "reactor caissons". Following the ASN's decision of 2020, applications for dismantling permits will be submitted for all these reactors in 2022, to obtain new decrees allowing continuation of dismantling operations according to an "in-air" strategy. Opening of the top part of the first UNGG reactor caisson – Chinon A2 – is expected in 2033: the initial extractions of vessel internals and graphite blocks are due to start in 2040 and last 14 years. In parallel, the other UNGG sites are finalising their work and operations to put the sites into a safe storage configuration (by 2035). A safe storage configuration state means that 80% of surfaces have been dismantled and the reactor caissons awaiting dismantling are safe: this will allow sufficient progress on the first reactor in this series to gain experience and ensure safety for the other five operations. Opening of the caissons after the first UNGG decommissioning is scheduled to take place in or after 2055;
- Creys Malville: this plant was shut down in 1998 and received its dismantling decree in 2006. The following key stages have been completed: removal of the fuel, dismantling of the machine room, drainage of the circuits, processing and elimination of the sodium used for cooling in all circuits, filling the reactor vessel, opening and extracting the vessel caps, and the start of dismantling of the core vessel cap (which weighs several hundred tonnes). The next stages are dismantling the vessel internals (due to be completed in 2026), electromechanical dismantling in the reactor building, then decontamination (dismantling should end in 2038);
- Brennilis: this plant was shut down in 1985 and received a partial dismantling decree in 2011 allowing dismantling of all installations peripheral to the "reactor block". The following key stages have been completed: removal of the fuel, dismantling of the machine room, the fuel building, auxiliary buildings, heat exchangers and the effluent treatment station. The next stages are examination of the application for full dismantling authorisation, with a view to obtaining a dismantling decree in 2022 that would enable EDF to dismantle the reactor block (the end of these operations is currently forecast at 2040).

28.4 Provisions for last cores

These provisions cover the future expenses resulting from scrapping fuel that will only be partially irradiated when the reactor is shut down. It is measured based on:

- the cost of the loss on fuel in the reactor that is not totally spent at the time of final reactor shutdown and cannot be reused due to technical and regulatory constraints ("front-end" expenses);
- the cost of fuel processing, and waste removal and storage operations ("back-end" expenses). These costs are valued in a similar way to provisions for spent fuel management and long-term radioactive waste management.

These unavoidable costs are components of the cost of nuclear reactor shutdown and decommissioning. As such, they are fully covered by provisions from the commissioning date and an asset associated with the provision is recognised. In a decision of 11 December 2020, France's Council of State challenged the tax-deductibility of the consequences of immediate recognition of a provision for dismantling of the last core ("front-end" last core expenses) (see note 14).

In 2020 after the Fessenheim plant was definitively shut down, €99 million of the provision for last cores, concerning the two reactors at Fessenheim, was reversed with a corresponding reduction in the inventories of non-irradiated fuel in the reactor at the time of the shutdown, and in parallel, provisions for spent fuel management and long-term radioactive waste management were recognised for the cost of processing this fuel and storage of the waste that will result.

28.5 Discount rate, inflation and sensitivity analyses

28.5.1 Calculation of the discount rate and inflation

Until 30 June 2020, the discount rate was based on the sliding 10-year average yield on French OAT 2055 treasury bonds which have a similar duration to the obligations, plus the spread of corporate bonds rated A to AA.

As of 31 December 2020, the methodologies used to determine the discount rate changed as follows:

The discount rate is now based on an interest rate curve, which comprises a sovereign yield curve constructed on year-end market data for liquid horizons (OAT bond 0-20 year curve) and then converging, using an interpolation curve, towards the very long-term rate UFR (Ultimate Forward Rate) – with yields that become close to the UFR after 50 years – plus a curve of the spread of corporate bonds rated A to BBB. Based on the disbursements expected to meet nuclear obligations, a single equivalent discount rate is deduced by applying the discount rates from the interest rate curve constructed in this way to each flow as appropriate to its maturity. This single discount rate is then applied to the forecast disbursement schedules for the costs of the obligations, to determine the provisions.

The UFR was defined by the European Insurance and Occupational Pensions Authority (EIOPA) for very long-term insurance liabilities that will involve disbursements beyond market horizons. The UFR calculated for 2020 is 3.51%. This is used in the calculation methodology, in compliance with the decision by the French authorities, which in the ministerial order of 1 July 2020 amending the order of 21 March 2007 on secure financing of nuclear expenses (see below) changed the formula of the regulatory ceiling for the discount rate, such that it now refers to the UFR instead of the arithmetic 48-month average of the TEC 30-year rate. The UFR is considered more relevant for nuclear provisions in view of the very long-term maturities. The sovereign yield curve indicates rates in a range of [-0.6%;0.2%] for outflows between 0 and 20 years, [0.2%; 3.2%] for outflows between 20 and 50 years, and a rate moving towards 3.51% for outflows after 50 years.

This change in calculation methodology for the discount rate provides the best assessment of the time value of money with regard to nuclear provisions, which are characterised by very long-term disbursement outflows, well beyond market horizons. This assessment is largely achieved through:

- use of an interest rate curve based on observed year-end market data with liquid horizons, converging over non-liquid horizons towards a very long-term rate with no cycle effect (instead of an average rate concerning a single duration corresponding to the average duration of the obligations), *i.e.* yield data for all the maturities associated with nuclear provisions;
- use of a very long-term rate (calculated UFR) produced by an independent body and now adopted by the French authorities in setting the formula of the regulatory ceiling, to take account of long trends in yield movements, in coherence with the distant disbursement horizon;
- a change in the references of the bond spread to include corporate bonds rated A to BBB by ratings agencies, in order to construct a robust spread curve since there are few AA-rated bonds, particularly on long maturities, whereas most "Investment Grade" bonds are BBB-rated bonds and the great majority of them have longer maturities.

The inflation assumption is based on an inflation curve constructed by reference to inflation-indexed market products and economic forecasts, in long-term coherence with the inflation assumption underlying the UFR (2%).

The discount rate determined is thus 3.3% at 31 December 2020, assuming inflation of 1.2% (3.7% and 1.4% respectively at 31 December 2019), giving a real discount rate of 2.1% at 31 December 2020 (2.3% at 31 December 2019).

Based on the calculation method used until 30 June 2020, the real discount rate would also be 2.1%.

28.5.2 Regulatory discount rate limit

Following the letter dated 12 February 2020 from the Minister for the Ecological and Inclusive Transition and the Minister of the Economy and Finance informing EDF of their decisions to change certain regulations regarding secure financing of nuclear expenses (see note 28.5.1 to the financial statements at 31 December 2019), the following were published in the *Journal officiel* of 2 July 2020:

- the decree of 1 July 2020 on secure financing for nuclear expenses, codifying and updating the initial decree of 23 February 2017;
- the ministerial order of 1 July 2020 on secure financing for nuclear expenses, amending the initial ministerial order of 21 March 2007.

This decree and ministerial order require the discount rate to comply with two regulatory limits from 1 July 2020. It must be lower than:

- a regulatory maximum, now expressed in real value, *i.e.* net of inflation; this value is equal to the unrounded value representative of expectations concerning the real long-term interest rate, as used for the calculation of the Ultimate Forward Rate (UFR) applicable at the date concerned published by the European Insurance and Occupational Pensions Authority (EIOPA), plus 150bp. This maximum is applicable from 2024. Until 2024, the maximum is the weighted average of 2.3% and the above calculation. The weighting applied to the 2.3% rate is set at 50% for 2020, 25% for 2021, 12.5% for 2022 and 6.25% for 2023;
- and the expected rate of return on assets covering the liability (dedicated assets).

The maximum discount rate under the new ministerial order effective from 1 July 2020, calculated by reference to the UFR, is 2.7% (real rate of 2.66% rounded up to 2.7%) at 31 December 2020.

The real discount rate used in the financial statements at 31 December 2020, in application of the methodologies presented above, is 2.1%.

The maximum discount rate in nominal value, based on the regulation applicable before the ministerial order of 1 July 2020 and calculated by reference to TEC 30 rates, was 3.8% (3.75% rounded up to 3.8%) at 31 December 2019. The nominal discount rate used in the financial statements at 31 December 2019 was 3.7%.

The decree of 1 July 2020 also introduced the following additional changes:

- it removed the obligation to add to dedicated assets when the coverage rate of obligations is above 100%, and raised the threshold above which withdrawals can be made from dedicated assets from 110% to 120%;
- it extended the period for making additions to dedicated assets in the event of a shortfall in coverage, after approval by the administrative authority, to 5 years compared to 3 previously;
- it added requirements for internal control and risk analysis on nuclear provisions, which operators must implement by 31 December 2021.

28.5.3 Analyses of sensitivity to macro-economic assumptions

Sensitivity to assumptions concerning costs, inflation rate, discount rate, and disbursement schedules can be estimated through comparison of the gross amount estimated under year-end economic conditions with the present value of the amount.

	2020		2019	
Provisions related to nuclear generation within the scope of the Law of 28 June 2006 *(in millions of euros)*	**Costs based on year-end economic conditions**	**Amounts in provisions at present value**	**Costs based on year-end economic conditions**	**Amounts in provisions at present value**
Spent fuel management	18,998	10,246	18,437	9,804
Amount unrelated to the operating cycle	*2,727*	*1,297*	*2,491*	*1,152*
Waste removal and conditioning	-	-	1,243	805
Long-term radioactive waste management	35,580	13,300	32,372	10,531
BACK-END NUCLEAR CYCLE EXPENSES	**54,578**	**23,546**	**52,052**	**21,140**
Decommissioning of nuclear plants in operation	19,693	12,775	21,134	13,244
Decommissioning of shut-down nuclear plants	7,400	4,714	6,428	3,693
Last cores	4,258	2,711	4,331	2,624
DECOMMISSIONING AND LAST CORE EXPENSES	**31,351**	**20,200**	**31,893**	**19,561**
PROVISIONS RELATED TO NUCLEAR GENERATION WITHIN THE SCOPE OF THE LAW OF 28 JUNE 2006*		**43,746**		**40,701**

* *Scope of application of the law of 28 June 2006 on the sustainable management of radioactive materials and waste and its application concerning secure financing of nuclear expenses. The provisions that do not fall within the scope of this law are provisions for the back-end of the nuclear cycle concerning non-EDF installations.*

The cumulative disbursements of nuclear expenses (based on gross values at year-end economic conditions) are distributed as follows:

Provisions related to nuclear generation within the scope of the Law of 28 June 2006 *(in millions of euros)*	2020		
	Costs based on year-end economic conditions		
	disbursement expected within 10 years	disbursement expected after 10 years*	TOTAL
Spent fuel management	7,176	11,822	18,998
Amount unrelated to the operating cycle	*239*	*2,488*	*2,727*
Long-term radioactive waste management	5,094	30,486	35,580
BACK-END NUCLEAR CYCLE EXPENSES	**12,270**	**42,308**	**54,578**
Decommissioning of nuclear plants in operation	707	18,986	19,693
Decommissioning of shut-down nuclear plants	2,756	4,644	7,400
Last cores	848	3,410	4,258
DECOMMISSIONING AND LAST CORES	**4,311**	**27,040**	**31,351**

**Over a 20-year and 50-year horizon, 22% and 40% respectively of cumulative disbursements (at year-end economic conditions) will concern long-term radioactive waste management provisions, and 47% and 96% respectively will concern decommissioning provisions.*

These approaches can be complemented by estimating the impact of a change in the discount rate on the discounted value.

The following table reports these details for the main components of EDF's provisions for the back-end of the nuclear cycle, decommissioning of nuclear plants and last cores:

	Amounts in provisions at present value	Sensitivity to discount rate			
		Balance sheet provisions		Pre-tax net income	
(in millions of euros)	31/12/2020	+0.20%	-0.20%	+0.20%	-0.20%
BACK-END NUCLEAR CYCLE EXPENSES:					
● spent fuel management	11,322	(261)	287	229	(253)
● waste removal and conditioning	13,300	(793)	954	646	(796)
DECOMMISSIONING AND LAST CORE EXPENSES:					
● decommissioning of nuclear plants in operation	12,775	(498)	522	-	-
● decommissioning of shut-down nuclear plants	4,714	(160)	172	160	(172)
● last cores	2,711	(91)	97	-	-
TOTAL	**44,822**	**(1,803)**	**2,032**	**1,035**	**(1,221)**
Amount covered by dedicated assets	32,676	(1,564)	1,772	875	(1,043)

Note 29 Other provisions for decommissioning

Other provisions for decommissioning principally concern fossil-fired power plants.

The costs of decommissioning fossil-fired power plants are calculated using regularly updated studies based on estimated future costs, measured by reference to the charges recorded on past operations and the most recent estimates for plants still in operation.

The provision recorded at 31 December 2020 reflects the most recent known cost estimates and includes rehabilitation costs for generation sites.

Note 30 Provisions for employee benefits

Changes in provisions for employee benefits were as follows:

		Increases		Decreases		
(in millions of euros)	31/12/2019	Operating [1] [2]	Financial [3]	Operating [2] [4]	Financial [5]	31/12/2020
Provisions for post-employment benefits	10,411	695	382	(715)	(212)	10,561
Provisions for long-term benefits	1,019	103	13	(80)	-	1,055
PROVISIONS FOR EMPLOYEE BENEFITS	**11,430**	**798**	**395**	**(795)**	**(212)**	**11,616**

(1) Including a past service cost of €485 million, amortisation of actuarial losses amounting to €303 million, and unvested benefits of €10 million.
(2) See notes 6 and 11.2.
(3) See note 13.
(4) Including €(771) million for employers' contributions and €(24) million for actuarial gains.
(5) For the expected return on fund assets.

Details of changes in the provisions:

(in millions of euros)	Obligations	Fund assets	Obligations net of fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
BALANCE AT 31/12/2019	**30,539**	**(12,315)**	**18,224**	**(29)**	**(6,765)**	**11,430**
Net expense for 2020	880	(212)	668	10	279	957
Unrecognised actuarial gains and losses	2,229	(1,136)	1,093	-	(1,093)	-
Contributions to funds	-	-	-	-	-	-
Benefits paid	(1,230)	459	(771)	-	-	(771)
BALANCE AT 31/12/2020	**32,418**	**(13,203)**	**19,214**	**(19)**	**(7,579)**	**11,616**

The actuarial gains and losses on obligations generated over 2020 amount to €2,229 million, and mainly reflect changes in the discount rate and inflation rate (€1,903 million), and €326 million of losses due to experience adjustments.

Post-employment and long-term employee benefit expenses:

(in millions of euros)	31/12/2020	31/12/2019
Current service cost [1]	485	409
Interest expenses (discount effect) [2]	395	614
Expected return on fund assets	(212)	(271)
Amortisation of unrecognised actuarial gains and losses – post-employment benefits	185	99
Change in actuarial gains and losses – long-term benefits	94	132
Effect of plan curtailment or settlement	-	-
Past service cost – vested benefits	-	-
Past service cost – unvested benefits	10	10
NET CHARGES RELATED TO POST-EMPLOYMENT BENEFITS AND LONG-TERM BENEFITS	**957**	**993**
including:		
Operating expenses [3]	774	651
Financial expenses	183	342

(1) The higher past service cost compared to 2019 essentially results from changes in actuarial assumptions at 31 December 2019, principally the decrease in the discount rate (-1.0%).
(2) The interest expenses (discount effect) of €395 million are €219 million lower in 2020 than 2019, as a result of the decrease in the discount rate between 1 January 2019 (2.3%) and 1 January 2020 (1.3%).
(3) In 2020, this amount corresponds to operating increases of €798 million net of reversals for actuarial gains and losses (€24 million).

30.1 Provisions for post-employment benefits

Details of these provisions are shown below:

		Increases		Decreases		
(in millions of euros)	31/12/2019	Operating	Financial	Operating	Financial	31/12/2020
Provisions for post-employment benefits	**10,411**	**695**	**382**	**(715)**	**(212)**	**10,561**
comprising:						
Pensions	7,257	377	291	(558)	(205)	7,162
CNIEG expenses	457	9	6	(13)	-	459
Benefits in kind (energy)	2,018	213	63	(121)	-	2,173
Retirement gratuities	32	39	8	(1)	(7)	71
Other benefits	648	57	14	(22)	-	697

(in millions of euros)	Obligations	Fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
Provisions for post-employment benefits at 31/12/2020	**31,363**	**(13,203)**	**(19)**	**(7,579)**	**10,561**
comprising:					
Pensions	23,757	(12,656)	-	(3,939)	7,162
CNIEG expenses	488	-	-	(29)	459
Benefits in kind (energy)	5,340	-	-	(3,167)	2,173
Retirement gratuities	630	(532)	(5)	(22)	71
Other benefits	1,148	(15)	(14)	(422)	697

(in millions of euros)	Obligations	Fund assets	Unrecognised past service cost	Unrecognised actuarial gains and losses	Provision in the balance sheet
Provisions for post-employment benefits at 31/12/2019	**29,519**	**(12,314)**	**(29)**	**(6,765)**	**10,411**
comprising:					
Pensions	22,576	(11,764)	-	(3,556)	7,257
CNIEG expenses	457	-	-	-	457
Benefits in kind (energy)	4,847	-	-	(2,829)	2,018
Retirement gratuities	602	(534)	(13)	(23)	32
Other benefits	1,037	(16)	(16)	(357)	648

30.2 Provisions for other long-term benefits for current employees

The amount of obligations for other long-term benefits awarded to current employees is identical to the corresponding balance sheet provisions. Details are as follows:

		Increases		Decreases	
(in millions of euros)	31/12/2019	Operating	Financial	Operating	31/12/2020
Provisions for other long-term benefits for current employees	**1,019**	**103**	**13**	**(80)**	**1,055**
comprising:					
Annuities following work-related accident and illness	870	89	11	(70)	900
Long service awards	129	12	2	(8)	135
Other	20	2	-	(2)	20

30.3 Fund assets

Fund assets, managed under an asset/liability model, amount to €13,203 million at 31 December 2020 (€12,314 million at 31 December 2019) and concern the coverage of retirement gratuities and the specific benefits of the special pension system.

The value of fund assets increased during the year, mainly as a result of favourable changes on the bond markets.

Investments under the contracts concerned break down as follows:

(in millions of euros)	31/12/2020	31/12/2019
TOTAL FUND ASSETS	**13,203**	**12,314**
Assets funding special pension benefits	**12,656**	**11,764**
(%):		
Equities	33%	31%
Bonds and monetary instruments	67%	69%
Assets funding retirement gratuities	**532**	**534**
(%):		
Equities	37%	34%
Bonds and monetary instruments	63%	66%
Assets funding other benefits	**15**	**16**

30.4 Actuarial assumptions

The main actuarial assumptions used for provisions for post-employment benefits and long-term employee benefits under the IEG system are summarised below:

- the discount rate is 0.90% at 31 December 2020 (1.30% at 31 December 2019);
- the inflation rate is estimated at 1.20% at 31 December 2020 (1.30% at 31 December 2019);
- the average residual period of employment is 19.4 years;
- the staff turnover rate is considered non-significant;
- the *tarif agent* (special energy price for EDF employees) includes changes in taxes based on that tariff;
- the expected return on fund assets covering past specific benefits under the special pension system is 1.77% for 2020 (2.55% for 2019);
- the expected return on fund assets covering retirement gratuities is 1.40% for 2020 (2.21% for 2019).

In France, the discount rate used for employee benefit obligations is determined by applying the yield rate on high-quality corporate bonds of appropriate duration to maturities corresponding to the future disbursements resulting from these obligations. For longer durations, the calculation also takes into consideration data from a wider selection of corporate bonds adjusted for comparability with the high-quality bonds, given the smaller panel of bonds with these durations since 2017. The decrease in the discount rate essentially relates to the decrease in risk-free rates observed over 2020.

Changes in the economic and market parameters used have led EDF to set the discount rate at 0.90% at 31 December 2020 (1.30% at 31 December 2019).

The inflation assumption is based on an inflation curve constructed from economic forecasts and inflation-indexed market products.

As a result of changes in the economic and market parameters, the assumed average inflation rate used as the EDF group's benchmark for Euro zone countries is 1.2% at 31 December 2020 (1.3% at 31 December 2019).

The obligations are based on wage increase assumptions that are differentiated by age group and employee category, with an average annual rise of 2.3% including inflation for a projected full career.

The wage law used to calculate obligations refers to wage increases observed over the period 2015-2018 (adjusted for non-recurring effects).

The mortality table used to calculate obligations is based on the INSEE 2013-2070 generation table (produced by the French statistics office), corrected for differences in mortality between the general French population and the population covered by the IEG regime.

Note 31 Provisions for other expenses

(in millions of euros)	31/12/2019	Increases: Operating	Decreases: Utilisations	Decreases: Reversals	Other	31/12/2020
Provisions for:						
● personnel expenses	84	54	(68)	(1)	-	69
● replacement of assets operated under concessions	272	10		(2)	(10)	270
● other expenses	516	696*	(24)	(1)		1,187
PROVISIONS FOR OTHER EXPENSES	**872**	**760**	**(92)**	**(4)**	**(10)**	**1,526**

* *Including a €538 million provision for tax litigation following the Council of State's decision of 11 December 2020 (see note 14).*

Note 32 Liabilities

(in millions of euros)	Maturity: < 1 year	Maturity: 1 - 5 years	Maturity: > 5 years	Gross value at 31/12/2020	Gross value at 31/12/2019
Liabilities					
Bonds	3,400	11,921	32,025	47,346	50,572
Borrowings from financial institutions	349	596	395	1,340	1,289
Other borrowings	3,108	7	3	3,118	1,845
Other financial liabilities:					
● advances on consumption	1	4	21	26	26
● other	1,025	-	-	1,025	1,439
Financial liabilities (see Note 33)	**7,883**	**12,528**	**32,444**	**52,855**	**55,171**
Advances and progress payments received [1]	**7,188**	**-**	**-**	**7,188**	**7,050**
Trade payables and related accounts	7,924	-	46	7,970	7,720
Tax and social security liabilities [2]	8,110	-	-	8,110	8,357
Liabilities related to fixed assets and related accounts	1,938	-	-	1,938	2,172
Other liabilities [3]	16,026	629	-	16,655	14,073
Operating, investment and other liabilities	**33,998**	**629**	**46**	**34,673**	**32,322**
Cash instruments	**2,973**	**470**	**1,632**	**5,075**	**4,387**
Deferred income [4]	**508**	**1,071**	**1,623**	**3,202**	**3,112**
TOTAL LIABILITIES	**52,550**	**14,698**	**35,745**	**102,993**	**102,042**

(1) Advances and progress payments received principally include monthly standing order payments by EDF's residential and business customers, amounting to €6,782 million at 31 December 2020 (€6,719 million at 31 December 2019).

(2) In 2020 this item includes an amount of €1,448 million for the CSPE to be collected by EDF on energy supplied but not yet billed (€1,463 million in 2019).

(3) Mainly the amount of current accounts, cash pooling and underwriting and cash management agreements with subsidiaries.

(4) Deferred income at 31 December 2020 comprises the partner advances made to EDF under nuclear plant financing plans and the associated long-term contracts, amounting to €1,713 million (€1,710 million in 2019). Deferred income on long-term contracts also includes the advance paid to EDF in 2010 under the agreement with the Exeltium consortium. This advance is transferred to the income statement progressively over the term of the contract. Deferred income also includes the initial payment under the Fessenheim compensation protocol.

Note 33 Financial liabilities

(in millions of euros)	Balance at 31/12/2019	New borrowings	Repayments	Translation adjustments	Other	Balance at 31/12/2020
Bonds *(in euros)* [1]	832	2,400	-	-	-	3,232
Bonds *(in non-euro)*	13,764	-	(2,534)	(938)	-	10,292
Euro-Medium Term Notes (EMTN) *(in euros)*	20,933	-	(1,200)	-	-	19,733
Euro-Medium Term Notes (EMTN) *(in non-euro)*	15,043	-	-	(954)	-	14,089
Bonds	**50,572**	**2,400**	**(3,734)**	**(1,892)**	**-**	**47,346**
Long-term loans *(in euros)*	1,289	200	(149)	-	-	1,340
Borrowings from financial institutions	**1,289**	**200**	**(149)**	**-**	**-**	**1,340**
Negotiable debt instruments *(in euros)*	785	1,286	-	-	-	2,071
Negotiable debt instruments *(non-euro)*	1,046	-	(760)	(72)	-	214
Contracual financial borrowings	14	7,353	(6,397)	(137)	-	833
Other borrowings [2]	**1,845**	**8,639**	**(7,157)**	**(209)**	**-**	**3,118**
Total borrowings	**53,706**	**11,239**	**(11,040)**	**(2,101)**	**-**	**51,804**
Advances on consumption	**26**	**-**	**-**	**-**	**-**	**26**
Miscellaneous advances [3]	453	38	(43)	-	(338)	110
Bank overdrafts	22	-	-	-	13	35
Deferred bank debits	16	-	-	-	(8)	8
Interest payable	948	-	-	-	(76)	872
Total other financial liabilities	**1,439**	**38**	**(43)**	**-**	**(409)**	**1,025**
TOTAL FINANCIAL LIABILITIES	**55,171**	**11,277**	**(11,083)**	**(2,101)**	**(409)**	**52,855**

(1) On 8 September 2020 EDF, EDF issued a €2.4 billion bond convertible into new shares and/or exchangeable for existing shares of the Company (see note 2.4.1).

(2) In 2020 EDF transferred bonds to several banks under repurchase agreements. At 31 December 2020 the cash received net of repayments already made amounts to €821 million, with a corresponding financial liability (see note 20 (4)). In 2020, issues of negotiable debt instruments, net of repayments, amount to €454 million.

(3) Including €(338) million relating to the 2020 Reset Perpetual Subordinated Notes on which EDF exercised its redemption option on 29 January 2020 (as part of a redemption offer concerning several existing hybrid bonds), which was classified in other financial liabilities at 31 December 2019.

33.1 Breakdown of loans by currency, before and after hedging instruments

	Debt structure in balance sheet				Impact of hedging instruments		Debt structure after hedging			
(in millions of euros)	Non-euro	In euros	% Non-euro	% of debt	Non-euro	In euros	Non-euro	In euros*	% Non-euro	% of debt
Total I – Euros		**26,888**		**52**		**19,718**		**46,606**		**90**
CHF	550	509	2	1	(550)	(509)	-	-	-	-
GBP	7,385	8,214	33	16	(3,000)	(3,337)	4,385	4,877	94	9
HKD	2,416	254	1	-	(2,416)	(254)	-	-	-	-
JPY	137,000	1,083	4	2	(137,000)	(1,083)	-	-	-	-
NOK	1,000	96	-	-	(1,000)	(96)	-	-	-	-
USD	18,094	14,760	60	29	(17,718)	(14,439)	376	321	6	1
Total II – Non euro currencies		**24,916**	**100**	**48**		**(19,718)**		**5,198**	**100**	**10**
TOTAL I + II		**51,804**		**100**		**-**		**51,804**		**100**

* *In 2020 EDF transferred bonds to several banks under repurchase agreements. At 31 December 2020 the cash received net of repayments already made amounts to €821 million (see note 33 (2)), including US$376 million (€321 million) and €500 million.*

The nominal value of hedging instruments included in off-balance sheet commitments (see note 35.1) has no effect on loans in the balance sheet.

33.2 Breakdown of loans by type of interest rate before and after hedging

	Debt structure in balance sheet			Impact of hedging instruments	Debt structure after hedging		
(in millions of euros)	Total	% 31/12/2020	% 31/12/2019	Total	Total	% 31/12/2020	% 31/12/2019
Long-term borrowings and EMTN	48,214			(20,678)	27,536		
Short-term borrowings	3,119			-	3,119		
Borrowings at fixed rate	**51,333**	**99**	**99**	**(20,678)**	**30,655**	**59**	**55**
Long-term borrowings and EMTN	471			20,678	21,149		
Short-term borrowings	-			-	-		
Borrowings at floating rate	**471**	**1**	**1**	**20,678**	**21,149**	**41**	**45**
TOTAL	**51,804**	**100**	**100**	**-**	**51,804**	**100**	**100**

Note 34 Unrealised foreign exchange gains

Unrealised foreign exchange gains at 31 December 2020 amount to €336 million (€219 million at 31 December 2019), of which €151 million concern two perpetual bonds in pounds sterling and €128 million concern a bond in pounds sterling that is entirely hedged by cross-currency swaps.

Other information

Note 35 Financial instruments

35.1 Off-balance sheet commitments related to currency and interest rate derivatives

EDF uses financial instruments to limit the impact of foreign exchange rate risks and interest rate risks.

	31/12/2020		31/12/2019	
(in millions of euros)	To be received (notional)	To be given (notional)	To be received (notional)	To be given (notional)
1 - Interest rate transactions				
Short-term interest rate swaps				
EUR	-	-	-	-
Long-term interest rate swaps				
EUR	10,385	10,385	8,239	8,239
USD	3,300	3,300	3,294	3,294
GBP	3,854	3,854	3,661	3,661
Sub-total	***17,539***	***17,539***	***15,194***	***15,194***
2 - Exchange rate transactions				
Forward transactions				
EUR	32,688	24,353	29,756	24,095
CAD	435	574	205	305
USD	16,671	20,643	17,681	21,333
GBP	6,138	8,903	5,800	6,579
CHF	192	361	958	1,177
ILS	354	405	273	273
PLN	137	177	343	389
JPY	79	835	96	857
CNY	102	102	2	2
MXN	102	101	106	105
Other currencies	637	740	568	568
Long-term currency swaps				
BRL	-	-	-	19
EUR	4,247	33,880	5,308	35,013
JPY	1,083	63	1,124	65
USD	15,807	1,709	20,985	3,128
GBP	15,120	2,557	13,035	2,234
CHF	509	-	507	-
ILS	86	86	93	93
PLN	14	14	14	10
NOK	96	-	101	-
MXN	-	10	-	12
HKD	254	-	276	-
Sub-total	***94,751***	***95,513***	***97,231***	***96,257***
3 - Securitisation swaps	**62**	**62**	**135**	**135**
4- Operations on market securities	**-**	**-**	**-**	**-**
Purchases and sales of options				
TOTAL FINANCIAL OFF-BALANCE SHEET COMMITMENTS	**112,352**	**113,114**	**112,560**	**111,586**
5- Commodity swaps				
Coal *(in millions of tonnes)*	-	-	2	2
Oil products *(in thousands of barrels)*	6,218	6,218	6,767	6,767

The amounts shown in the above table are the nominal values of contracts, translated where necessary using 2020 year-end exchange rates (regardless of whether they are classified as hedges).

35.2 Impacts of financial instrument transactions on net income

(in millions of euros)	2020	2019
Instruments not classified as hedges		
Interest rate instruments*	141	160
Forex instruments	(274)	239
Instruments classified as hedges		
Interest rate instruments	710	735
Forex instruments	(118)	359

* *Including interest on swaps.*

35.3 Fair value of derivative financial instruments

The fair value of currency and interest rate swaps was calculated by discounting future cash flows using year-end market exchange and interest rates, over the remaining term of the contracts (market value includes accrued interest).

The book value of off-balance sheet derivatives includes accrued interest, equalisation payments and premiums paid or received, plus translation adjustments, which are already booked in EDF's accounts. The difference between book value and market value is the unrealised gain or loss.

The fair value of derivative financial instruments reported off-balance sheet at 31 December 2020 as calculated by EDF is as follows:

(in millions of euros)	Book value	Fair value
Interest rate hedges		
● Interest rate swaps	157	2,720
Exchange rate hedges		
● Forward exchange transactions and currency swaps	227	248
● Cross-currency swaps	(1,032)	(1,668)
Commodity hedges		
● Coal	-	(6)
● Oil products	-	(13)
TOTAL	**(648)**	**1,281**

Note 36 Other off-balance sheet commitments and operations

At 31 December 2020, off-balance sheet commitments related to operations, financing and investments (other than electricity supply commitments and partnership agreements) comprise the following:

	Maturity					
(in millions of euros)	< 1 year	1-5 years	5-10 years	> 10 years	31/12/2020	31/12/2019
Off-balance sheet commitments given	**12,939**	**18,850**	**10,997**	**10,469**	**53,255**	**54,725**
Operating commitments	**6,593**	**13,270**	**10,596**	**6,325**	**36,784**	**37,942**
● Commitments related to fuel and energy purchases	3,262	9,824	7,825	6,172	27,083	29,081
● Other operating commitments	3,331	3,446	2,771	153	9,701	8,861
Investment commitments	**2,815**	**3,325**	**387**	**99**	**6,626**	**7,640**
Financing commitments	**3,531**	**2,255**	**14**	**4,045**	**9,845**	**9,143**
Off-balance sheet commitments received	**2,743**	**9,472**	**458**	**657**	**13,330**	**13,053**
Operating commitments	**1,248**	**885**	**458**	**257**	**2,848**	**2,982**
Investment commitments	**-**	**-**	**-**	**-**	**-**	**-**
Financing commitments	**1,495**	**8,587**	**-**	**400**	**10,482**	**10,071**

36.1 Commitments given

In almost all cases, commitments given are reciprocal, and the third parties concerned are under an obligation to supply EDF with assets or services related to operating, investing and financing transactions.

At 31 December 2020, these commitments mature as follows:

36.1.1 Fuel and energy purchase commitments

In the course of its ordinary Generation and supply activities, EDF has entered into long-term contracts for purchases of electricity, other energies and commodities and nuclear fuel, for periods of up to 20 years.

	Maturity					
(in millions of euros)	< 1 year	1-5 years	5-10 years	> 10 years	31/12/2020	31/12/2019
Electricity purchases and related services	1,513	3,569	3,141	3,855	12,078	12,669
Nuclear fuel purchases	1,749	6,255	4,684	2,317	15,005	16,412
FUEL AND ENERGY PURCHASE COMMITMENTS	**3,262**	**9,824**	**7,825**	**6,172**	**27,083**	**29,081**

Electricity purchases and related services

Electricity purchase commitments mainly concern:

- Island Energy Systems (SEI), which has given commitments to purchase electricity generated from bagasse and coal, and electricity generated by the plants of EDF's subsidiary PEI;
- hedging contracts: these are forward purchases, for which the volumes and prices are set in contracts with EDF Trading.

In addition to the obligations reported above and under Article 10 of the Law of 10 February 2000, in mainland France EDF is obliged to purchase, at the producer's request and subject to compliance with certain technical features, the power produced by co-generation plants and renewable energy generation units (wind turbines, small hydro-electric plants, photovoltaic power, etc.).

The additional costs generated by this obligation are offset, after validation by the CRE, by the CSPE. These purchase obligations total 59TWh for 2020 (57TWh for 2019), including 7TWh for co-generation (7TWh for 2019), 31TWh for wind power (30TWh for 2019), 11TWh for photovoltaic power (11TWh for 2019) and 4TWh for hydropower (3TWh for 2019).

Nuclear fuel purchases

Commitments for purchases of nuclear fuel arise from supply contracts for the nuclear plants intended to cover EDF's needs for uranium and fluoration, enrichment and fuel assembly fabrication services.

The decrease in nuclear fuel purchases in 2020 is mainly explained by the execution of existing contracts.

36.1.2 Other operating commitments

These are mostly commitments undertaken by EDF through signature of orders relating to operations or contracts in progress, related guarantees, and commitments as lessee under irrevocable operating lease contracts principally for premises, equipment and vehicles. The corresponding rents are subject to renegotiation at intervals defined in the contracts.

The increase in these commitments mainly relates to bank guarantees given by EDF and additional purchases for repair work on the main secondary circuit welds at the Flamanville 3 EPR.

36.1.3 Investment commitments

Investment commitments are mostly commitments for acquisitions of property, plant and equipment. The decrease in EDF's commitments for acquisitions of intangible assets and property, plant and equipment mainly relates to the Flamanville 3 EPR.

36.1.4 Financing commitments

These are financing commitments by EDF to its subsidiaries, in 2020 mainly €3,615 million to EDF International, €2,060 million to EDF Trading, €1,298 million to EDF Renewables, €847 million to EDF Energy, €799 million to Edison and €700 million to Enedis.

36.2 Commitments received

36.2.1 operating commitments

These commitments mainly comprise:

- operating lease commitments received as lessor;
- operating guarantees received;
- operating sale commitments, essentially concerning engineering services for HPC;
- personnel secondment commitments for Edvance.

36.2.2 Financing commitments

These commitments correspond to the total value of credit lines available to EDF from various banks.

36.3 Other types of commitment

36.3.1 Electricity supply commitments

In the course of its business, EDF has signed long-term contracts to supply electricity as follows:

- long-term contracts with a number of European electricity operators, for a specific plant or for a defined group of plants in the French nuclear generation fleet, corresponding to installed power capacity of 3.5GW;
- by French law, EDF has a commitment to sell some of the energy generated by its existing nuclear power plants to other suppliers on the French market. This has concerned volumes of up to 150TWh each year since 1 January 2020, until 31 December 2025.

36.3.2 Gas purchases and related services

Gas purchase commitments are given by EDF in connection with its expanding gas supply business.

Gas purchases for supply, delivery and storage are mostly undertaken through long-term contracts and forward purchases from EDF Trading.

Under the contract with the Dunkerque LNG methane terminal, EDF also benefits from approximately 61% of the terminal's regasification capacities until 2037, in return for payment of an annual premium of approximately €150 million. A provision for onerous contracts is recorded in connection with this contract.

Note 37 Contingent liabilities

A contingent liability is:

- a potential obligation arising from past events, which will only be confirmed by the occurrence (or non-occurrence) of one or more uncertain future events that are not completely within the entity's control; or
- a present obligation arising from past events that is not recognised in the financial statements because an outflow of resources representing economic benefits is unlikely to be necessary to extinguish the obligation, or because the amount of the obligation cannot be measured reliably.

Tax inspections

For the years 2012 to 2017, the French tax authorities notified the Company of certain recurrent tax reassessments concerning the *Contribution sur la Valeur ajoutée des Entreprises* (tax on corporate value added) and questioned the deductibility of long-term provisions.

Labour litigation

EDF is party to a number of labour lawsuits, primarily regarding working hours. EDF estimates that none of these lawsuits, individually, is likely to have a significant impact on its results or financial position. However, because they relate to situations that could concern a large number of EDF's employees, any increase in such litigations could have a potentially negative impact on EDF's financial position (although the risk has been mitigated by the signature of the agreement on fixed numbers of working days in 2016).

Note 38 Dedicated assets

38.1 Regulations

Article L. 594 of France's Environment Code and its implementing regulations require assets (dedicated assets) to be set aside for secure financing of nuclear plant decommissioning expenses and long-term storage expenses for radioactive waste. These regulations govern the way dedicated assets are built up, and the management and governance of the funds themselves. Dedicated assets are clearly identified and managed separately from the Company's other financial assets and investments. They are also subject to specific monitoring and control by the Board of Directors and the administrative authorities.

The law requires the realisable value of dedicated assets to be higher than the value of the provisions corresponding to the present value of the long-term nuclear expenses defined in France's Environment Code.

The Decree of 1 July 2020 codified the regulatory obligations concerning dedicated assets in Articles D. 594-1 to 18 of the Environment Code, complemented by the ministerial order of 21 March 2007 amended by the order of 1 July 2020. These documents define the list of eligible assets, which is largely based on France's Insurance Code and includes unlisted assets subject to certain conditions. In particular, they authorise allocation to dedicated assets of the shares of CTE, which has held 100% of the capital of RTE since 31 December 2017 (see note 38.2.2 below).

EDF received ministerial authorisation on 31 May 2018 to increase the portion of unlisted assets in its dedicated assets from 10% to 15% subject to conditions (this does not apply to the shares of CTE or real estate assets).

Since the decree of 1 July 2020, apart from the obligation to allocate €797 million to dedicated assets in 2020 as a result of the previous regulations, which was confirmed to EDF by a letter from the administrative authority on 12 February 2020, EDF is no longer obliged to add to dedicated assets when the coverage rate of obligations, determined by the ratio of the assets' realisable value to the amount of the provisions concerned, is above 100%, and withdrawals from dedicated assets are not authorised unless that rate is above 120%.

38.2 Strategic allocation and composition of dedicated assets

Given the regulations governing dedicated assets, they form a highly specific category of assets.

Dedicated assets are structured and managed according to a strategic allocation defined by the Board of Directors and reported to the administrative authorities. The strategic allocation is designed to meet the overall objective of long-term coverage of obligations, and determines the structure and management of the portfolio as a whole. It takes into account regulatory constraints concerning the nature and liquidity of the dedicated assets, the financial outlook for the equity and bond markets, and the diversifying contribution of unlisted assets.

Several changes have been made to this strategic allocation, in order to pursue the diversification into unlisted assets:

- in 2010 the shares in RTE (now held *via* CTE) were allocated to dedicated assets;
- in 2013 an unlisted asset portfolio (consisting of infrastructures, real estate and debt or equity funds) was set up and is managed by EDF SA's "EDF Invest" Division; and
- in 2013 the receivable recognised by the French State was allocated to dedicated assets. This receivable represented the accumulated shortfall in CSPE financing at 31 December 2012, and was fully reimbursed at 31 December 2020.

On 29 June 2018 the Board of Directors validated the principle of strategic allocation for dedicated assets:

- yield assets (target of 30% of dedicated assets), consisting of infrastructure assets, including the shares of CTE, and real estate property;
- growth assets (target of 40% of dedicated assets), consisting of equity funds investing in listed or unlisted equities;
- fixed-income assets (target of 30% of dedicated assets), consisting of listed bonds or listed bond funds, unlisted debt funds, receivables and cash.

These targets should be reached gradually by 2025.

38.2.1 Growth assets and fixed-income assets

Certain growth and fixed-income assets take the form of bonds held directly by EDF. Others consist of specialised collective investment funds on leading international markets, managed by independent asset management companies. They take the form of open-end funds and "reserved" funds located in France, established for the Company.

The listed equity funds consist of international equities (mainly in North America but also in Europe, Asia-Pacific and emerging countries). Listed bonds and listed bond funds consist of sovereign and corporate bonds.

These investments are structured and managed in line with the strategic allocation, which takes into consideration international stock market cycles, for which the statistical inversion generally observed between equity market cycles and bond market cycles – as well as between geographical areas – has led to a long-term investment policy with appropriate allocation between growth assets and fixed-income assets.

Growth assets also include a small portion of funds invested in unlisted equities, and fixed-income assets also include a small portion of funds invested in unlisted debt. These funds are managed by EDF Invest (see note 38.2.2).

In the course of operational asset monitoring, the Group applies long-term, specific management rules defined and supervised by its governance bodies (maximum investment ratios, volatility analyses and assessment of individual fund manager quality).

38.2.2 Yield assets

The yield assets managed by EDF Invest consist mainly of assets related to investments in infrastructures and real estate, made either directly by EDF Invest or by investment funds under delegated management arrangements.

Through unlisted investment funds, EDF Invest also manages growth assets and fixed-income assets (see note 38.2.1).

At 31 December 2020, the assets managed by EDF Invest represent a total realisable value of €6,905 million, including €6,420 million of yield assets. Yield assets mainly include:

- 50.1% of EDF's shares in CTE, amounting to €2,788 million at 31 December 2020 (€2,926 million at 31 December 2019);
- EDF's investments in Teréga, Energy Assets Group, Porterbrook, Autostrade per l'Italia, Q-Park, Thyssengas, Aéroports de la Côte d'Azur, Madrileña Red de Gas (MRG), Géosel, Central Sicaf, Ecowest, Korian & Partenaires Immobilier, Nam Theun Power Company and companies that own wind and solar power plants (in the United States, Canada, the United Kingdom, and Portugal).

38.2.3 Valuation of edf's dedicated assets

Dedicated assets are classified in the balance sheet according to their accounting nature: investments, investment securities, and marketable securities. They are valued under the accounting principles presented in note 1.

Details of the portfolio at 31 December 2020 are as follows:

	31/12/2020		31/12/2019	
(in millions of euros)	**Net book value**	**Realisable value**	**Net book value**	**Realisable value**
Investment in CTE (the company that owns RTE) (1)	2,705	2,788	2,705	2,926
Other investment securities	24,195	27,148	22,246	24,816
Other financial investments and shareholder loans (2)	3,136	3,421	2,623	2,965
Dedicated assets – Investments	**30,036**	**33,357**	**27,574**	**30,707**
Marketable securities	260	262	192	192
Dedicated assets – Marketable securities	**260**	**262**	**192**	**192**
CSPE receivable (3)	-	-	684	688
Total dedicated assets before hedging	**30,296**	**33,619**	**28,450**	**31,587**
Hedging instruments and other	48	229	(5)	37
TOTAL DEDICATED ASSETS AFTER HEDGING (4)	**30,344**	**33,848**	**28,445**	**31,624**

(1) EDF's investment of 50.1% of CTE, the company that holds 100% of the shares in RTE. The realisable value of CTE presented in the above table has been determined by an independent assessor, in the same way as for EDF Invest's other assets.

(2) Including €155 million of shareholder loans due to be capitalised, relating to the long-term investment in a real estate vehicle controlled and managed by Korian.

(3) The receivable consisting of accumulated shortfalls in compensation at 31 December 2015, less the portion assigned on 22 December 2016. This receivable was fully reimbursed at 31 December 2020, in line with the repayment schedule.

(4) Limiting the value of certain investments in compliance with Article 16 of Decree 2007-243 concerning calculation of the regulatory realisable value of dedicated assets has no effect at 31 December 2020 or 2019.

Net book value and fair value include unmatured accrued interest.

38.2.4 Coverage of long-term nuclear obligations

At 31 December 2020, by the regulatory calculations provisions are 103.6% covered by dedicated assets. The regulatory caps on the realisable value of certain investments set in the Environment Code were respected at 31 December 2020.

At 31 December 2019, by the regulatory calculations provisions were 105.5% covered by dedicated assets and also respected these regulatory caps on realisable value.

The long-term nuclear obligations concerned by the regulations for dedicated assets related to nuclear generation are included in EDF's financial statements at the following values:

(in millions of euros)	31/12/2020	31/12/2019
Provisions for spent fuel management – portion unrelated to the operating cycle as defined in the regulations	1,297	1,152
Provisions for long-term radioactive waste management	13,300	10,531
Provision for removal and conditioning of waste	-	805
Provisions for nuclear plant decommissioning	17,489	16,937
Provisions for last cores – portion for future long-term radioactive waste management	590	550
PRESENT COST OF LONG-TERM NUCLEAR OBLIGATIONS	**32,676**	**29,975**

38.2.5 Changes in dedicated assets in 2020

In April 2020, EDF Invest acquired a minority interest in Energy Assets Group (EAG) in the United Kingdom (smart meters), and minority interests in real estate assets (offices in France and healthcare properties in Europe).

In December 2020 EDF SA acquired investments in wind and solar power plants in the United States, Canada and Portugal from EDF Renewables. All these investments were allocated to dedicated assets in 2020, in addition to the €113 million allocation during the first half-year corresponding to the balance of the investment in the MiRose and Red Pine wind farms acquired from EDF Renewables in 2019.

Allocations to dedicated assets in 2020 totalled €797 million (€540 million in 2019), comprising €299 million in the form of asset contributions and €498 million in cash, in compliance with EDF's obligation for 2020 under the regulatory framework (see note 38.1).

The first half of 2020 saw an unprecedented situation on the financial markets. The equity markets rose significantly until mid-February, then the spread of the Covid-19 pandemic drew them into their sharpest downturn in more than 30 years. The lowest point was on 20 March but ultimately there was a strong recovery until the end of the half-year, largely stimulated by urgent intervention by the central banks.

The year 2020 ended with good performances for all assets, particularly thanks to the exceptional budget and monetary measures taken to support the economy.

The US Federal Bank once again adopted a zero-rate policy, and the ECB introduced a quantitative easing programme on an unprecedented scale, involving assets of much lower quality than in previous quantitative easing campaigns. Consequently, contrary to expectations in the early part of the year, government bond yields declined significantly (-0.4% on the Bund 10-year yield to -0.58%, and -0.9% on BTP Italian government bonds to +0.52%). The year ended on a positive note as political uncertainties were lifted with the US Presidential elections, and most importantly a last-minute deal for Brexit.

Withdrawals from dedicated assets in 2020 totalled €431 million, equivalent to payments made in respect of the long-term nuclear obligations to be covered during the year (€442 million in 2019).

At 31 December 2020, dedicated assets registered an overall performance of €1,364 million, comprising €584 million in financial result and €780 million in exceptional result. This is principally explained by dividends and interest received (€727 million), increases to provisions on bonds and investment funds due to unfavourable market trends (€(168) million), and gains on sales of investment securities (€780 million).

Note 39 Related parties

39.1 Relations with subsidiaries

	EDF's receivables [1]		EDF's liabilities [1]			
(in millions of euros)	**Loans**	**Operating receivables**	**Net liabilities included in current account**	**Operating liabilities**	**Financial expenses**	**Financial income (excluding dividends)**
Companies						
ATMEA	137					
CTE (formerly C25)		126		132		
Framatome		144		451		
EDF Energy		63		137		2
EDF Renouvelables	2,083					18
EDF Energy UK Ltd. EUR						
EDF International	10,877					199
EDF Trading		1,230		1,369		5
Edison Nouveau						2
Enedis	931	97		1,810		6
Dalkia France	1,331			137		35
Groupe PEI	643					15
Citelum	59					3
EDF Luminus	80					1
Edvance		58		56		
C77	155					
Current accounts [2]				1,450		
Investment agreement for liquidities of subsidiaries			1,985		(7)	
Group cash management agreement with subsidiaries [3]			11,436			
Tax consolidation agreement				1,216		

(1) Receivables and payables of more than €50 million.
(2) Including €548 million concerning Sofilo and €418 million concerning PEI.
(3) Including €5,225 million concerning C3, €1,577 million concerning EDF Trading and €1,058 million concerning EDF Energy.

39.2 Relations with the French State and State-owned entities

39.2.1 Relations with the French State

The French State holds 83.68% of the capital of EDF at 31 December 2020, and is thus entitled in the same way as any majority shareholder to control decisions that require approval by the shareholders.

In accordance with the legislation applicable to all companies having the French State as their majority shareholder, EDF is subject to certain inspection procedures, in particular economic and financial inspections by the State, audits by the French Court of Auditors (Cour des Comptes) or Parliament, and verifications by the French General Finance Inspectorate (Inspection générale des finances).

The public service contract between the French State and EDF was signed on 24 October 2005. This contract is intended to form the framework for public service missions assigned to EDF by the lawmaker for an unlimited period. The Law of 9 August 2004 does not stipulate the duration of the contract.

39.2.2 Relations with public sector entities

EDF's relations with public sector entities mainly concern the two entities belonging to the former AREVA group (Orano and AREVA SA).

Transactions with Orano concern:

- the front-end of the nuclear fuel cycle (uranium supplies, conversion and enrichment services);
- the back-end of the nuclear fuel cycle (transportation, storage, processing and recycling services for spent fuel).

Front-end of the cycle:

Several important agreements have been negotiated between EDF and Orano:

- for supplies of natural uranium: Orano Mining contracts;
- for fluoration: an Orano Chimie-Enrichissement (formerly Orano Cycle) contract;
- for enrichment of natural uranium into uranium 235: an Orano Chimie-Enrichissement contract.

In connection with the plan to construct two EPRs in the UK at the Hinkley Point site, on 29 September 2016 EDF and Orano signed a uranium contract with Orano Mining, and a conversion contract and an enrichment contract with Orano Chimie-Enrichissement.

Back-end of the cycle:

Relations between EDF and Orano Recyclage concerning transportation, processing and recycling of spent fuels are described in note 28.

Note 40 Management compensation

The Company's key management and governance personnel are the Chairman and CEO and the Directors. In application of the law, Directors representing the employees receive no remuneration for their services.

The total gross compensation (salaries and all types of benefits, excluding employer contributions) paid by EDF to the Company's key management and governance personnel was as follows in 2019 and 2020.

(in euros)	2020	2019
Chairman and CEO [1]	453,660	453,660
Directors [2]	439,946 [3]	440,000

(1) At its meeting of 13 February 2020 the Board of Directors decided to keep the fixed annual compensation of the Chairman and Chief Executive Officer at €450,000 for 2020, the same as in 2019.

(2) The General Shareholders' Meeting of 7 May 2020 approved the Board of Directors' proposal taken at its meeting of 13 February 2020 to set the annual budget for Directors' compensation at €440,000 for 2020.

(3) This amount includes Directors' fees paid in 2020 to Directors whose terms of office ended during 2019, amounting to a total €50,142.

Note 41 Subsequent events

No significant event has occurred since the year-end.

6.4 Statutory Auditors' report on the financial statements

This is a translation into English of the Statutory Auditors' report on the financial statements of the Company issued in French and it is provided solely for the convenience of English-speaking users.

This Statutory Auditors' report includes information required by European regulation and French law, such as information about the appointment of the Statutory Auditors or verification of the management report and other documents provided to shareholders. This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

For the year ended 31 December 2020

To the Shareholders,

Opinion

In compliance with the engagement entrusted to us by your General Meeting, we have audited the accompanying financial statements of Électricité de France SA ("EDF" or the "Company") for the year ended 31 December 2020.

In our opinion, the financial statements give a true and fair view of the assets and liabilities and of the financial position of the Company as at 31 December 2020 and of the results of its operations for the year then ended in accordance with French accounting principles.

The audit opinion expressed above is consistent with our report to the Audit Committee.

Basis for Opinion

Audit Framework

We conducted our audit in accordance with professional standards applicable in France. We believe that the audit evidence we have collected is sufficient and appropriate to provide a basis for our opinion.

Our responsibilities under those standards are further described herein in the *Statutory Auditors' Responsibilities for the Audit of the financial statements* section of our report.

Independence

We conducted our audit engagement in compliance with independence requirements of the French Commercial Code (*Code de commerce*) and the French Code of Ethics (*Code de déontologie*) for Statutory Auditors for the period from 1 January 2020 to the date of our report and specifically we did not provide any prohibited non-audit services referred to in Article 5(1) of regulation (EU) No 537/2014.

Justification of Assessments – Key Audit Matters

Due to the global crisis related to the Covid-19 pandemic, the financial statements of this period have been prepared and audited under specific conditions. Indeed, this crisis and the exceptional measures taken in the context of the state of sanitary emergency have had numerous consequences for companies, particularly on their operations and their financing, and have led to greater uncertainties on their future prospects. Those measures, such as travel restrictions and remote working, have also had an impact on the companies' internal organization and the performance of the audits.

It is in this complex and evolving context that, in accordance with the requirements of Articles L. 823-9 and R. 823-7 of the French Commercial Code (*Code de commerce*) relating to the justification of our assessments, we inform you of the key audit matters relating to risks of material misstatement that, in our professional judgment, were of most significance in our audit of the financial statements of the current period, as well as how we addressed those risks.

These matters were addressed in the context of our audit of the financial statements taken as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on specific items of the financial statements.

Valuation of provisions related to nuclear generation in France – back-end of the nuclear cycle, plant decommissioning and last cores – and dedicated assets
Notes 1.2.2, 1.7.2, 1.15.1, 3.1, 18, 28 and 38 to the financial statements

Key Audit Matter

As at 31 December 2020, the provisions recorded to cover obligations relating to nuclear power plants for which EDF is the operator in France total €44,822 million, including €24,622 million with respect to the back-end of the nuclear cycle (management of spent fuel and radioactive waste) and €20,200 million with respect to the decommissioning of nuclear power plants and last cores.

The valuation of these provisions depends on the regulatory context is described in Notes 1.15.1 and 28. It requires defining technical and financial assumptions and using complex calculation models.

They are updated and the assumptions taken into consideration in the models are reviewed at least once a year. As of 31 December 2020, the methodologies used to determine the discount rate changed, in connection with the change in 2020 in certain regulations regarding secure financing of nuclear expenses. These assumptions reflect management's best estimate at the reporting date of the impacts of the applicable regulation, the implementation of decommissioning and storage processes or changes in the main financial parameters.

Furthermore, the Company is required to allocate so-called "dedicated" assets to secure financing of certain categories of nuclear provisions in France. The realizable value of these assets should allow the Company's commitments relating to the decommissioning of nuclear power plants and long-term storage of radioactive waste in France to be covered (notes 38). The realizable value of these dedicated assets, for an amount of €33,848 million (or a net carrying amount of €30,344 million) as of 31 December 2020, was determined based on the fair value of diversified equity and bonds investments, and the equity value of a non-listed assets portfolio managed by the division EDF Invest.

We considered the valuation of provisions related to nuclear generation and dedicated assets to be a key audit matter due to:

- the sensitivity of the assumptions on which the valuation of these provisions is based, notably in terms of cost, inflation and long-term discount rates, as well as the depreciation periods of nuclear power plants in operation, and forecast cash outflows; the modification of these parameters can lead to a material revision in the provisioned amounts;
- the negative impacts on the financial position of the Company (cash earmarked to increase the amount of dedicated assets) in the event of an increase in nuclear provisions in France, a change in the realizable values of dedicated assets or changes in the coverage rate of nuclear provisions for dedicated assets;

  it being specified that the valuation of provisions covers and includes uncertainties related to the fact that certain scenarios and technical solutions have never been implemented.

Responses

We have analyzed the measures for recognizing provisions related to nuclear generation in France and gained an understanding of the industrial scenarios for decommissioning nuclear power plants and the technical solutions adopted in terms of management of spent fuel and radioactive waste. We have assessed the compliance of the methods for determining the provisions with regard to applicable accounting, legal and regulatory measures.

We have verified the calculation models used by the Company and assessed the assumptions adopted in terms of cost, forecast cash outflows and financial parameters (discount and inflation rates).

Our work also consisted in verifying the type of costs used to determine provisions and assessing the reconciliation of forecast costs and forecast cash outflows with industrial scenarios as well as the available studies and quotes.

We have also assessed the appropriateness of:

- margins for uncertainties and risks included in the provisions, to take into account the degree of control over decommissioning techniques and the management of spent fuel and radioactive waste;
- the series and mutualization effects adopted in the quotes for decommissioning nuclear power plants in operation, for which the nominal cost represents €19,693 million to economic conditions at the end of the period, for a provision of €12,775 million in discounted value (note 28.5.3).

Concerning the inflation and discount rates and their calculation methods adopted by management described in note 28.5, we have verified their compliance with applicable accounting standards and regulatory measures, notably the ministerial decree and order of 1 July 2020. We have reconciled the data used for this purpose with available market data.

Concerning the securing of financing for certain of these provisions through dedicated assets, we have reconciled the realizable value of the dedicated assets in the portfolio at the reporting date with the available certificate of depository statements, and available external data and valuations. We have also assessed the accounting treatment and their valuation, in particular the compliance with the accounting standard of the impairment model described in the accounting principles and methods of the note 1.7.2.

Finally, we have verified the appropriateness of the disclosures given in the Notes for the provisions related to nuclear generation in France and the dedicated assets, notably regarding the sensitivity of the valuation of provisions to changes in macro-economic assumptions (note 28.5.3).

Specific Verifications

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by laws and regulations.

Information given in the management report and in the other documents with respect to the financial position and the financial statements provided to the shareholders

We have no matters to report as to the fair presentation and the consistency with the financial statements of the information given in the management report of the Board of Directors, and in the other documents with respect to the financial position and the financial statements provided to shareholders.

We attest the fair presentation and the consistency with the financial statements of the information relating to payment deadlines mentioned in Article D.441-4 of the French Commercial Code (*Code de commerce*).

Information relating to corporate governance

We attest that the section of the management report devoted to corporate governance sets out the information required by Articles L. 225-37-4, L. 22-10-10 and L. 22-10-9 of the French Commercial Code.

Concerning the information given in accordance with the requirements of Article L. 22-10-9 of the French Commercial Code (*Code de commerce*) relating to remunerations and benefits received by the Directors and any other commitments made in their favour, we have verified its consistency with the financial statements, or with the underlying information used to prepare these financial statements and, where applicable, with the information obtained by your Company from controlling and controlled companies. Based on these procedures, we attest the accuracy and fair presentation of this information.

With respect to the information relating to items that your Company considered likely to have an impact in the event of a public takeover bid or exchange offer, provided pursuant to Article L. 22-10-11 of the French Commercial Code, we have agreed this information to the source documents communicated to us. Based on these procedures, we have no observations to make on this information.

Other information

In accordance with French law, we have verified that the required information concerning the purchase of investments and controlling interests and the identity of the shareholders and holders of the voting rights has been properly disclosed in the management report.

Report on Other Legal and Regulatory Requirements

Format of presentation of the financial statements intended to be included in the annual financial report

We have also verified, in accordance with the professional standard applicable in France relating to the procedures performed by the Statutory Auditor relating to the annual and financial statements presented in the European single electronic format, that the presentation of the financial statements intended to be included in the annual financial report mentioned in Article L. 451-1-2, I of the French Monetary and Financial Code (*Code monétaire et financier*), prepared under the responsibility of the Chief Executive Officer, complies with the single electronic format defined in the European Delegated Regulation N° 2019/815 of 17 December 2018. As it relates to financial statements, our work includes verifying that the tagging of these financial statements complies with the format defined in the above delegated regulation.

Based on the work we have performed, we conclude that the presentation of the financial statements intended to be included in the annual financial report complies, in all material respects, with the European single electronic format.

We have no responsibility to verify that the financial statements that will ultimately be included by your Company in the annual financial report filed with the AMF are in agreement with those on which we have performed our work.

Appointment of the Statutory Auditors

We were appointed as Statutory Auditors of Électricité de France SA by the General Meeting of 6 June 2005 for KPMG Audit and the by decision of the Board of Directors of 25 April 2002 for Deloitte & Associés.

As at 31 December 2020, KPMG Audit was in the 16th year of total uninterrupted engagement and Deloitte & Associés was in the 19th year of total uninterrupted engagement, which for both 16 years since securities of the Company were admitted to trading on a regulated market.

Responsibilities of Management and Those Charged with Governance for the financial statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with French accounting principles and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless it is expected to liquidate the Company or to cease operations.

The Audit Committee is responsible for monitoring the financial reporting process and the effectiveness of internal control and risks management systems and where applicable, its internal audit, regarding the accounting and financial reporting procedures.

The financial statements were approved by the Board of Directors.

Statutory Auditors' Responsibilities for the Audit of the financial statements

Objectives and audit approach

Our role is to issue a report on the financial statements. Our objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement.

Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with professional standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As specified in Article L. 823-10-1 of the French Commercial Code (*Code de commerce*), our statutory audit does not include assurance on the viability of the Company or the quality of management of the affairs of the Company.

As part of an audit conducted in accordance with professional standards applicable in France, the Statutory Auditor exercises professional judgment throughout the audit and furthermore:

- identifies and assesses the risks of material misstatement of the financial statements, whether due to fraud or error, designs and performs audit procedures responsive to those risks, and obtains audit evidence considered to be sufficient and appropriate to provide a basis for his opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtains an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control;
- evaluates the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management in the financial statements;
- assesses the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. This assessment is based on the audit evidence obtained up to the date of his audit report. However, future events or conditions may cause the Company to cease to continue as a going concern. If the Statutory Auditor concludes that a material uncertainty exists, there is a requirement to draw attention in the audit report to the related disclosures in the financial statements or, if such disclosures are not provided or inadequate, to modify the opinion expressed therein;
- evaluates the overall presentation of the financial statements and assesses whether these statements represent the underlying transactions and events in a manner that achieves fair presentation.

Report to the Audit Committee

We submit a report to the Audit Committee which includes in particular a description of the scope of the audit and the audit program implemented, as well as the results of our audit. We also report, if any, significant deficiencies in internal control regarding the accounting and financial reporting procedures that we have identified.

Our report to the Audit Committee includes the risks of material misstatement that, in our professional judgment, were of most significance in the audit of the financial statements of the current period and which are therefore the key audit matters, that we are required to describe in this report.

We also provide the Audit Committee with the declaration provided for in Article 6 of regulation (EU) N° 537/2014, confirming our independence within the meaning of the rules applicable in France such as they are set in particular by Articles L. 822-10 to L. 822-14 of the French Commercial Code (*Code de commerce*) and in the French Code of Ethics (*Code de déontologie*) for Statutory Auditors. Where appropriate, we discuss with the Audit Committee the risks that may reasonably be thought to bear on our independence, and the related safeguards.

Paris La Défense, 17 February 2021

The Statutory Auditors

KPMG S.A.		**Deloitte & Associés**	
Jay Nirsimloo	Michel Piette	Damien Leurent	Christophe Patrier

6.5 Dividend policy

6.5.1 Dividends and interim dividends paid in the last three fiscal years

The amount of dividends and interim dividends paid in the last three fiscal years was as follows:

Fiscal year	Number of shares	Dividend per share *(in euros)*	Total dividends paid [1] *(in euros)*	Dividend payment date
2017	2,927,438,804	0.46 [2]	1,341,187,189.41 [3]	19 June 2018
2018	3,010,267,676	0.31 [4]	933,556,364.41 [5]	18 June 2019
2019	3,050,969,626	0.15 [6]	456,888,323.70 [6]	17 December 2019

(1) After deduction of treasury shares.

(2) i.e. €0.506 in 2017 for shares benefiting from the increased dividend.

(3) Of which €432,632,648.85 in interim dividends paid on 11 December 2017 for that year comprising €398,440,228.20 in new shares, €33,746,467.50 in cash and a balancing payment of €445,953.15. The remaining €908,554,540.56 of the dividend for 2017, paid on 19 June 2018, comprised €847,339,360.56 in new shares, €60,331,512.63 in cash and a balancing payment of €883,667.37.

(4) i.e. €0.341 in 2018 for shares benefiting from the increased dividend.

(5) Of which €451,000,397.55 in interim dividends paid entirely in cash on 10 December 2018 for that year. The remaining €482,555,966.86 of the dividend for 2018, paid on 18 June 2019, comprised €452,021,956.95 in new shares and €30,534,009.91 in cash.

(6) The 2019 interim dividend of €456,888,323.70, paid on 17 December 2019, comprised €429,635,913.60 in new shares, €27,252,346.20 in cash and a balancing payment of €63.90.

On 19 November 2019, EDF's Board of Directors decided to pay an interim dividend of €0.15 per share.

The interim dividend for the 2019 fiscal year came to €456,888,323.70 and was paid on 17 December 2019:

- payment in shares was effected *via* a share capital increase of €26,325,730.00 corresponding to the issue of 52,651,460 shares with a par value of €0.50 each, accompanied by a share premium of €403,310,183.60 and a balancing payment of €63.90;
- payment in cash totalled €27,252,346.20.

In the context of the Covid-19 health crisis and in order to demonstrate the necessary solidarity and responsibility towards all of the Company's stakeholders, the General Meeting of 7 May 2020 decided that the dividend for the fiscal year ending 31 December 2019 would be limited to the payment of the interim dividend for 2019.

In addition, EDF has not distributed an interim dividend in respect of fiscal year 2020.

At its meeting of 17 February 2021, the Board of Directors decided to propose to the Shareholders' Meeting that will be called to approve the financial statements for the year ended 31 December 2020 and will be held on 6 May 2021, the payment of a dividend of €0.21 per share (excluding increased dividend) for the 2020 fiscal year. The dividend payable for the 2020 fiscal year comes to €0.231 per share for shares benefiting from the increased dividend.

Shareholders will be offered the option of having the remaining dividend paid out in new Company shares. This option will be available between 14 May and 1 June 2021 inclusive. For shareholders who have not exercised their option by 1 June 2021 at the latest, all remaining dividend payments will be made in cash. The French State has undertaken to have its dividend paid out in the form of new shares.

New common shares issued to pay for the share capital increase will only entitle their holders to payment of the balance of the dividend for 2019.

Subject to the approval of the Shareholders' Meeting, the dividend will be paid on 7 June 2021 with the ex-dividend date set at 12 May 2021.

6.5.2 Dividend policy, increased dividend

The dividend policy formulated by the Board of Directors takes the Group's investment needs, the economic context and any other relevant factor into account.

In accordance with the amendment to the articles of association passed by the Shareholders' Meeting of 24 May 2011, the first increased dividend was paid in 2014 for the previous year. Shareholders holding their shares in registered form for at least two years are entitled to an increased dividend. The number of shares eligible for the 10% increased dividend may not exceed 0.5% of the share capital for a single shareholder.

On 21 November 2014, the Shareholders' Meeting amended the articles of association to the effect of authorising it to approve the payment of any dividend, interim dividend, reserves or premium that is distributed or any reduction in capital, through delivery of the Company's assets, including financial securities.

6.5.3 Unclaimed dividends

Dividends not claimed within five years of their payment date lapse in favour of the French State.

6.6 Other items

6.6.1 Table of results for the last five fiscal years

(taken from EDF's corporate financial statements):

	2020	2019	2018	2017	2016
Capital at year end					
Share capital *(in millions of euros)*	1,550	1,552	1,505	1,464	1,055
Capital contributions *(in millions of euros)*					
Number of common shares in existence	3,099,923,579	3,103,621,086	3,010,267,676	2,927,438,804	2,109,136,683
Number of priority dividend shares (with no voting rights) in existence					
Maximum number of future shares to be created					
by conversion of bonds					
by exercise of subscription rights					
Operating results for the year *(in millions of euros)*					
Sales excluding taxes	44,315	46,155	44,874	42,371	40,857
Income before tax, employee profit-sharing, depreciation, amortisation and provisions	8,051	7,639	7,925	5,091	9,495
Income tax	(406) [2]	605	(756) [2]	(687) [2]	680
Employee profit-sharing for the year					
Income after tax, employee profit-sharing, depreciation, amortisation and provisions	222	1,593	1,591	1,924	5,517
Dividends			934 [1]	1,341 [1]	2,105 [1]
Interim dividends	0	457	451	433	1,006
Earnings per share *(in euros/share)*					
Income after tax and employee profit-sharing but before depreciation, amortisation and provisions	2.73	2.27	2.88	1.97	4.18
Income after tax, employee profit-sharing, depreciation, amortisation and provisions	0.07	0.51	0.53	0.66	2.62
Dividend per share	0.21		0.31 [1] [5]	0.46 [1] [4]	0.90 [1] [3]
Interim dividend per share	0	0.15	0.15	0.15	0.50
Employees					
Average number of employees over the year	62,462	63,530	64,927	66,577	69,494
Total payroll expense for the year *(in millions of euros)*	3,694	3,654	3,711	3,831	4,001
Amounts paid for employee fringe benefits for the year (social security, Company benefit schemes, etc.) *(in millions of euros)*	2,745	2,799	2,854	2,923	2,873

(1) Including interim payment.
(2) Amount corresponding to a tax product.
(3) i.e. 0.99 euro for shares benefiting from the bonus dividend.
(4) i.e. €0.506 for shares benefiting from the bonus dividend.
(5) i.e. €0.341 for shares benefiting from the bonus dividend.

6.6.2 Significant change in the financial or trading position

Significant events occurring between the last day of the 2020 fiscal year and the date of the filing of this Universal Registration Document are mentioned in note 23 of the appendix to the consolidated financial statements of the year ended 31 December 2020 for events which occurred before 17 February 2021, when the Board of Directors approved the financial statements and, for events which occurred after 17 February 2021, in section 5.2 "Subsequent events" of this Universal Registration Document.

6.6.3 Informations on invoice settlement times (account payable and receivable) (as required by Article L. 441-6-1 of the French Commercial Code)

Within the framework of the LME Act as amended by Act no. 2015-990 promoting growth, activity and equal economic opportunities, EDF publishes the amounts, including VAT, of debts and receivables due at the end of the fiscal year. These amounts are broken down by tranche of overdue payments and posted respectively to the amount including VAT of purchases and sales for the fiscal year.

	Article D. 441 I.- 1°: overdue invoices which have been received but not paidat the closing date of the fiscal year						Article D. 441 I.- 2°: overdue invoices which have been issued but not paid at the closing date of the fiscal year					
	0 day	1-30 days	31-60 days	61-90 days	91 days and more	Total (1 day and more)	0 day	1-30 days	31-60 days	61-90 days	91 days and more	Total (1 day and more)
(A) Period overdue												
Number of invoices	97,229					5,580	3,490,782					6,810,973
Total amount of invoices (including VAT)	2,625	6	2	2	0	10	1,387	192	77	60	673	1,002
% of the total amount of purchases of the year	5.5	0.0	0.0	0.0	0.0	0.0						
% of total amount of sales of the year (including VAT)							2.5	0.3	0.1	0.1	1.2	1.8
(B) Invoices excluded from (A) relating to payables and receivables in dispute or unrecognised												
Number of invoices excluded						0						0
Number of invoices excluded						0						0
(C) Reference payment terms applied (contractual or statutory – Article l. 441-6 or Article L. 43-1 of the French Commercial Code)												
Payment terms used for calculating periods overdue	Legal and contractual deadlines						Legal deadlines					

6.6.4 Information on existing branches – as required by Article L. 231-1 of the Commercial Code

At 31 December 2020, the Group had 201 secondary establishments registered with the French Trade and Companies Registers, as stated in the Company's "K-bis" registration certificate, and operated on French territory through several thousand different offices which do not fulfil the independent management criterion to qualify as a branch.

EDF's branches outside [1] mainland France are listed below:

- Saint-Barthélemy;
- Saint-Pierre-et-Miquelon;
- Saint Martin;
- United Arab Emirates: Abu Dhabi and Dubai;
- Bahrain;
- Benin;
- Cambodia;
- China; Taïshan;
- South Africa;
- Cape Verde;
- Qatar;
- New Caledonia;
- Togo.

(1) In fiscal terms, this is a list of permanent establishments located outside France.

6.7 Information relating to the allocation of funds raised through Green Bonds issued by EDF

Since 2013 the Group has conducted five Green Bond issues for a total of around €6.9 billion in order to support its development in renewable energies.

After two bond issues chiefly meant to finance the building of new wind and solar projects by its subsidiary EDF Renewables (€1.4 billion in November 2013 and $1.25 billion in October 2015), the Group expanded its Green Bond Framework to finance investments in the renovation and modernisation of its hydropower assets in mainland France. The new Framework was first applied to a €1.75 billion issue in October 2016 and then to a JPY 26 billion issue in two tranches in January 2017. The Group further extended the scope of its Green Bond Framework at the beginning of 2020 by opening it up to international hydropower assets, energy efficiency projects and biodiversity conservation projects. In this context, the Group issued a new green bond for an amount of €2.4 billion in September 2020.

The commitments made by EDF in the context of these bond issues follow the four Green Bond Principles [(1)] guiding (i) the use of proceeds, (ii) existing processes for evaluating and selecting eligible projects, (iii) the management of proceeds, and (iv) reporting procedures. A detailed description of these investments can be found in the EDF Green Bond Framework of January 2020 available on the Green Bonds page of the Company's website.

This section provides a summary of these commitments and how EDF has fulfilled them as at the end of 2020.

Use of proceeds

EDF has committed itself to allocate the proceeds from its Green Bonds programme to finance new investments in renewable energy projects. Projects eligible for Green Bond financing ("Eligible Projects") are:

- the construction or acquisition of a portfolio of renewable energy power generation projects including wind, solar, hydro, storage, biomass and geothermal projects;
- investments in existing hydroelectric facilities, including renovation and heavy maintenance; modernisation and automation; and development of existing facilities (including power increases);
- energy efficiency projects, including projects to reduce energy consumption, modernise lighting, heating and cooling network projects and projects involving the creation of charging stations for electric vehicles;
- biodiversity preservation projects, such as actions to mitigate the impact of EDF's activities on biodiversity, site restoration or re-naturalisation and research and development.

The *Green Bond Framework* provides that the funds may finance projects which would not have benefited from financing through a green bond within 3 years before the issuance year of the green bond (look-back clause). Similarly, the funds can be used to acquire a portfolio of renewable energy projects

Assessment and selection of financed eligible projects

Each Eligible Project to be funded is assessed against the environmental and social eligibility criteria [(2)] ("E&S criteria") specified in Appendix 1 of the Green Bond Framework. This assessment is based on five elements, including (1) compliance with ethical, transparent and sustainable human resources criteria; (2) monitoring of the project's environmental impact; (3) promotion of occupational health and safety; (4) responsible supplier relations; and (5) a commitment to organise a consultation process for each new project.

Only projects that meet these criteria are eligible for Green Bond financing.

Compliance with these criteria is certified by Deloitte (auditor) in accordance with the requirements of the Green Bond Framework. On this basis, the Finance Departments of the Group entities in question designate the Eligible Projects that are financed.

Management of proceeds

Proceeds raised are managed according to a strict ring-fencing principle in order to ensure that their use is exclusively and effectively reserved for financing Eligible Projects.

Once received by EDF's Finance and Investment Department, proceeds from each bond issue are invested and tracked in a dedicated sub-portfolio of treasury assets until allocated to Eligible Projects. Proceeds are invested in priority in treasury assets identified as Socially Responsible Investments (SRI).

The Finance Divisions of each entity notify EDF Treasury Division, on an ongoing basis or at regular intervals, the proceeds needed to cover investments related to the selected projects. Based on this information, the Treasury Division adjusts the amounts available in the dedicated treasury asset sub-portfolios.

Reporting

Effective use of proceeds

All the proceeds raised in November 2013 under the first Green Bond issued by EDF for €1.4 billion were allocated by June 2015. All the proceeds raised in October 2015 under the second Green Bond issued for $1.25 billion were allocated by the end of 2017. The funds raised as part of the third Green Bond issued in October 2016 (€1.75 billion) were allocated at the end of 2019. All the proceeds raised in January 2017 under the fourth Green Bond issued for ¥26 billion were allocated in mid-2020.

As at 31 December 2020, €2,384 million of the €2.4 billion raised in September 2020 under the fifth Green Bond issued by EDF, which generated net proceeds of €2,559 million due to an issue price that was 7% higher than the nominal value, had been allocated to Eligible Projects. The balance of proceeds raised under this bond issue was invested in a dedicated treasury asset portfolio, as indicated above, where it will remain until allocated to Eligible Projects.

(1) The Green Bond Principles, updated in June 2018, are voluntary guidelines for issuance of Green Bonds. They recommend transparency and disclosure and promote integrity to support development of the Green Bond market. For more information, see http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles.

(2) The E&S criteria for each project type are presented in the appendix to the EDF Green Bond Framework of September 2016 and January 2020.

ALLOCATION OF PROCEEDS AT 31 DECEMBER 2020

Allocation of proceeds at 31 December 2020:	Nominal value at issuance	Funds raised at 31 December 2020	Funds allocated to Eligible Projects	Number of Green Bond funded projects	Share of investment financed *via* Green Bonds proceeds
Green Bond no. 1 – November 2013	€1.4 bn	€1.4 bn	*of which renewable capacities €1.4 billion*	13 [1]	59%
Green Bond no. 2 – November 2015	$1.25 bn	$1.25 bn	*of which renewable capacities: $1.25 billion*	7 [1, 2]	58%
Green Bond no. 3 – October 2016	€1.75 bn	€1.75 bn	*of which renewables capacities: €1,248 million*	10 [2, 3]	54%
			of which hydroelectric projects: € 502 million	600 transactions	100%
Green Bond no. 4 – January 2017	¥26,000 m	¥26,000 m	*of which renewable capacities: ¥14,021 million*	7 [3]	15%
			of which hydroelectric projects: ¥11,979 million	207 transactions	87% [4]
Green Bond no. 5 September 2020	€ 2.4 bn	€2,384 m	*of which renewable capacities: €2,246 million (including €1,461 million in look back)*	27 projects [3] + 3 acquired portfolios	77%
			of which hydropower projects: €110 million	153 transactions [5]	100%
			of which biodiversity projects held by EDF Hydro: €28 million (including €16 million in look back)	39 projects	100%

(1) Including the Roosevelt Project, financed by Green Bonds 1 and 2.
(2) Including the Red Pine Project, financed by Green Bonds 2 and 3.
(3) Including the Milligan and Las Majadas Projects, financed by Green Bonds 3, 4 and 5.
(4) Share of total investments financed by EDF, including half of the investment in the Romanche-Gavet project.
(5) Including 31 operations already partly financed by a previous Green Bond.

At 31 December 2020, the following Eligible Projects had been chosen by EDF Renewables for financing under the first three Green Bonds issued in November 2013 (GB1), October 2015 (GB2) October 2016 (GB3), January 2017 (GB4) and September 2020 (GB5):

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
CID Solar	PV Solar, 27MWp	US (California)	In service	GB1
Cottonwood	PV Solar, 33MWp	US (California)	In service	GB1
Catalan wind farm	Onshore wind, 96MW	France (Pyrénées-Orientales)	In service	GB1
Heartland	Biogas, 20MW	US (Colorado)	In service	GB1
Hereford	Onshore wind, 200MW	US (Texas)	In service	GB1
La Mitis	Onshore wind, 25MW	Canada (Quebec)	In service	GB1
Le Granit	Onshore wind, 25MW	Canada (Quebec)	In service	GB1
Longhorn North	Onshore wind, 200MW	US (Texas)	In service	GB1
Pilot Hill	Onshore wind, 175MW	US (Illinois)	In service	GB1
Rivière du Moulin	Onshore wind, 350MW	Canada (Quebec)	In service	GB1
Spinning Spur 2	Onshore wind, 161MW	US (Texas)	In service	GB1
Spinning Spur 3	Onshore wind, 194MW	US (Texas)	In service	GB1
Roosevelt	Onshore wind, 250MW	US (New Mexico)	In service	GB1 and GB2
Great Western	Onshore wind, 225MW	US (Oklahoma)	In service	GB2
Kelly Creek	Onshore wind, 184MW	US (Illinois)	In service	GB2
Salt Fork	Onshore wind, 174MW	US (Texas)	In service	GB2
Slate Creek	Onshore wind, 150MW	US (Texas)	In service	GB2
Tyler Bluff	Onshore wind, 126MW	US (Texas)	In service	GB2
Red Pine	Onshore wind, 200MW	US (Minnesota)	In service	GB2 and GB3
Bluemex Power 1	PV Solar, 120MWp	Mexico (Sonora)	In service	GB3
Copenhagen Wind Farm	Onshore wind, 80MW	US (New York)	In service	GB3
Nicolas Riou	Onshore wind, 112MW	Canada (Quebec)	In service	GB3
Rock Falls	Onshore wind, 154MW	US (Oklahoma)	In service	GB3
Stoneray Power Partners	Onshore wind, 100MW	US (Minnesota)	In service	GB3
Valentine Solar	PV Solar, 135MW	US (California)	In service	GB3
Glaciers Edge	Onshore wind, 203MW	US (Iowa)	In service	GB3
Milligan	Onshore wind, 300MW	US (Nebraska)	In service	GB3, GB4 and GB5
Las Majadas	Onshore wind, 273MW	US (Texas)	In service	GB3, GB4 and GB5
Maverick 1	PV Solar, 180MW	US (California)	In service	GB5
Maverick 4	PV Solar, 132MW	US (California)	In service	GB5
Desert Harvest	PV Solar, 114MW	US (California)	In service	GB5
Desert Harvest 2	PV Solar, MW	US (California)	In service	GB5
Coyote	Onshore wind, 242MW	US (Texas)	In service	GB5
Champagne Picardie	Onshore wind, 73MW	France	In service	GB5 (look back)
Les Taillades	Onshore wind, 27MW	France	In service	GB5 (look back)
Pays d'Anglure	Onshore wind, 22MW	France	In service	GB5 (look back)
Montagne Ardéchoise	Onshore wind, 16MW	France	In service	GB5 (look back)
Blyth	Offshore wind, 42MW	United Kingdom	In service	GB5 (look back)
Mashabai Sadeh	PV Solar, 60MW	Israel	In service	GB5 (look back)
Romney	Onshore wind, 60MW	Canada (Ontario)	In service	GB5 (look back)
Courant-Nachamps	Onshore wind, 21MW	France	In service	GB5 (look back)
Demange	Onshore wind, 20MW	France	In service	GB5 (look back)
Faydunes	Onshore wind, 14MW	France	In service	GB5 (look back)
Joncels Futuren	Onshore wind, 8MW	France	In service	GB5 (look back)
Coteaux	Onshore wind, 38MW	France	In service	GB5 (look back)
Mazurier	Onshore wind, 13MW	France	In service	GB5 (look back)
Mottenberg	Onshore wind, 15MW	France	In service	GB5 (look back)
Espiers	Onshore wind, 18MW	France	In service	GB5 (look back)
Clanlieu	Onshore wind, 13MW	France	In service	GB5 (look back)
Luxel	Solar project portfolio	France		GB5 (look back)
NnG	Offshore wind, 450MW	United Kingdom	2023	GB5 (look back)
Atlantic Offshore	Offshore wind, up to 2.3GW	US (New Jersey)		GB5 (look back)

The Eligible Projects selected by Luminus for financing as at 31 December 2020 as part of the January 2017 Green Bond issue in yen (GB4) and September 2020 (GB5) can be broken down as follows:

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
Geel-West	Onshore wind, 11MW	Belgium	In service	GB4
Villers 4	Onshore wind, 45MW	Belgium	In service	GB4
Turnhout	Onshore wind, 12MW	Belgium	In service	GB4
Monsin	Hydropower, 18MW	Belgium	In service	GB4
Tinlot	Onshore wind, 10MW	Belgium	In service	GB5
Lommel	Onshore wind, 17MW	Belgium	In service	GB5

The Eligible Projects selected by EDF ENR for financing as at 31 December 2020 as part of the Green Bond issue in September 2020 (GB5) can be broken down as follows:

Projects	Type and Capacity	Location	Year come into service	Green Bond Financing
ITER	Ombrière Solar, 2MW	France	2021	GB5
Bugey RTE	Ombrière Solar, 4MW	France	2021	GB5

The Eligible Projects selected by EDF Hydro (excluding biodiversity projects which are detailed below) for financing as at 31 December 2020 as part of the Green Bond issue in October 2016, January 2017 and September 2020 can be broken down as follows:

Projects	Number of operations by type	Capacity in question *(MW)*	Amounts *(in €M)*
Renovation and heavy maintenance	586	9.6	342
Modernisation and automation	309	15.9	80
Development of existing structures	33	1.2	277
TOTAL (EXCL. DUPLICATION)	**928**	**17.1**	**699**

Impact of financed Eligible Projects

The table below shows three main impacts associated with the renewable energy projects that received Green Bond financing:

- the electricity generation capacity built under each EDF Renewables, Luminus or EDF ENR project or renovated, modernised or developed as part of the hydropower investments;
- the additional electricity generation expected from each project; and
- the estimated CO_2 emissions avoided as a result of injecting this additional electricity generation into the electricity grid.

These impacts are presented in aggregate: gross data correspond to the aggregate impact of every project that received financing from the Green Bond in question; while the net values correspond to the total sum of the impact of each Eligible Project weighted by the share of project investment amount financed by the Green Bond in question.

		Total capacity of projects financed at 31 December 2020 *(in MW)*		Expected output *(in TWh/year)*		Estimated CO_2 emissions avoided *(in megatonnes/year)*	
		Gross [1]	**Net** [2]	**Gross** [1]	**Net** [2]	**Gross** [1]	**Net** [2]
Green Bond no. 1 – November 2013		1,529	976	6.0	4.1	2.21	1.55
Green Bond no. 2 – October 2015		1,107	815	4.6	3.3	2.53	1.83
Green Bond no. 3 – October 2016	EDF Renewables	1,450	962	5.3	3.5	2.42	1.61
	EDF Hydro	903	903	0.2 [3]	0.2 [3]	0.01 [3]	0.01 [3]
Green Bond no. 4 – January 2017	EDF Renewables + Luminus	137	86	0.4	0.26	0.17	0.12
	EDF Hydro + Luminus	142	133	0.1	0.05	0.01	0.01
Green Bond no. 5 – September 2020	EDF Renewables + EDF ENR + Luminus	1,355	1,088	4.0 [4]	3.1 [4]	1.59 [4]	1.15 [4]
	EDF Hydro	123	123	0.03	0.03	0.001	0.001
TOTAL		**6,746**	**5,084**	**20.6**	**14.6**	**8.9**	**6.3**

(1) Sum of the gross impacts of each project that received Green Bond financing.
(2) Sum of the impacts of each project weighted by the project investment amount financed by the Green Bond in question.
(3) Only related to the expected additional generation resulting from development investments, including half of the expected additional generation of the Romanche-Gavet project.
(4) Excluding any acquisition.

The above impacts are established using the methodological principles below:

- generation capacity of financed projects: installed capacity at the end of the construction of each Eligible Project as defined in the project's investment memorandum and updated as appropriate during the construction phase or at project commissioning;
- expected output: generation forecast (the "P50") taken into account when the investment decision of each Eligible Project is made;
- avoided CO_2 emissions: the average emission factor per kWh of the electric system is estimated on the basis of the energy mix of the electric system and LCA emission factors of each generation technology. The emission factor of the project corresponds to the LCA emission factor of the project's production chain. The energy mixes are those published by the Energy Information Administration (EIA, 2018) for large power networks in the United States, Statistics Canada (2018) for the networks and provinces of Canada, and the International Energy Agency (2018) for other countries. LCA emission factors of each technology correspond to the median values established by the Intergovernmental Panel on Climate Change (IPCC) and published in its fifth assessment report (2014). The detailed methodology is available on request at the EDF group head office. It is important to note that (i) there is no single standard defining a methodology for calculating avoided CO_2 emissions and (ii) the expected output and, therefore avoided, CO_2 emissions are estimated forecast data and not actual data.

Biodiversity

The table below presents the main monitoring indicators associated with biodiversity projects that have received financing through Green Bond financing. All of these projects were supported by EDF Hydro.

Year(s)	Amount financed *(in million of euros)*	Category of green bond framework	Type of project	Number of projects considered [1]	Indicator	Indicator value
2020	12	a. Projects and/or facilities that integrate the principles of the avoid-reduce-compensate" approach (mitigation hierarchy) related to the mitigation of the impact of the Group's activities on biodiversity.	Bringing reserved flows into compliance [2]	4	Number of protected wildlife species benefiting from the project	6
			Ecological continuity (sediments, fish, semi-aquatic mammals) [2]	17		17
			Biodiversity partnerships	7	Number of species targeted by partnerships	20
		b. Restoration and/or "re-naturalising" of sites	Decommissioning of facilities	1	Number of protected wildlife species benefiting from the project	3
2017 – 2019 (Look Back financing)	16	a. Projects and/or facilities that integrate the principles of the "avoid-reduce-compensate" approach (mitigation hierarchy) related to the mitigation of the impact of the Group's activities on biodiversity.	Bringing reserved flows into compliance [2]	7	Number of protected wildlife species benefiting from the project	6
			Ecological continuity (sediments, fish, semi-aquatic mammals) [2]	22		16
		b. Restoration and/or "re-naturalising" of sites	Re-naturalising/ restoration of which ecosystem services	1	Area concerned (ha)	190
			Decommissioning of facilities	1	Number of protected wildlife species benefiting from the project	3

(1) 19 projects are included in both the look back and 2020 impact reporting.

(2) A project at the Esterre dam has elements of compliance with reserved flows and ecological continuity; it is therefore counted for the calculation of the indicators for these two types of projects.

The impacts presented above are established on the basis of the following methodological principles:

- **The indicator "number of protected wildlife species benefiting from the project"** is established on the basis of the lists of target species of the works attached to their execution files or the watercourse classification decrees, and the analysis of EDF naturalist experts. As these operations mainly concern aquatic environments, only aquatic and semi-aquatic species are counted, although these projects generally benefit a wider range of animal and plant species. If a species benefits several projects, it is counted only once.
- **The indicator "number of species targeted by partnerships"** refers to species named in partnership agreements or activity reports (families of species are therefore not counted). Biodiversity partnerships cover a wide range of activities, from raising awareness to land management or carrying out naturalist inventories or ecological status diagnoses.
- **The "area concerned" indicator** is measured in hectares (ha). It corresponds to the surface area of projects involving the re-naturalisation or restoration of environments.

Attestation from one of the statutory auditors of EDF SA on the information related to the allocation, as of 31 December 2020, of funds raised for the "Green Bonds" issued by EDF on 25 November 2013, 8 October 2015, 11 October 2016, 26 January 2017 and 8 September 2020

This is a free translation into English of the attestation from one of the statutory auditors of EDF SA on the information related to the allocation, as of 31 December 2020, of funds raised for the "Green Bonds" issued by EDF on 25 November 2013, 8 October 2015, 11 October 2016, 26 January 2017 and 8 September 2020 originally issued in French and is provided solely for the convenience of English speaking readers. This attestation should be read in conjunction with, and is construed in accordance with, French law and professional standards applicable in France

To the Chairman and Chief Executive Officer,

In our capacity as statutory auditor of Electricité de France S.A. (the "**Company**") and in accordance with your request, we have prepared this attestation on the information related to the allocation, as of 31 December 2020, of funds raised for the "Green Bonds" (the "**Offerings**") issued by EDF on 25 November 2013 amounting to €1.4 billion (the "**GB1 Offering**"), 8 October 2015 amounting to US$ 1.25 billion (the "**GB2 Offering**"), 11 October 2016 amounting to €1.75 billion ("**GB3 Offering**"), 26 January 2017 amounting to ¥26 billion ("**GB4 Offering**") and 8 September 2020 amounting to €2.4 billion ("**GB5 Offering**") contained in the attached document "*Information relating to the allocation of funds raised through Green Bonds issued by EDF in November 2013, October 2015, October 2016, January 2017, and September 2020*", and prepared pursuant to the terms and conditions of the final terms of the Green Bond Offerings dated 25 November 2013, 8 October 2015, 11 October 2016, 26 January 2017, and 8 September 2020 (the "**Final Terms**").

This document, prepared for the purposes of the information of the "Green Bond" debt securities holders, presents an allocation of the funds raised from the Green Bond Offerings to eligible projects (the "**Eligible Projects**") for the period beginning as of the receipt of the funds raised from the Green Bond Offerings to 31 December 2020 (the "**Allocation of Proceeds**") and over the 3-year look-back period prior to the year of the GB5 Offering:

- For an amount of €1.4 billion in relation to the GB1 Offering, from 27 November 2013 to 31 December 2015, noting that the allocation of proceeds was completed in full in June 2015;
- For an amount of US$1.25 billion in relation to the GB2 Offering, from 13 October 2015 to 31 December 2017, noting that the allocation of proceeds was completed in full by the end of 2017;
- For an amount of €1.75 billion in relation to the GB3 Offering, from 11 October 2016 to 31 December 2019, noting that the allocation of proceeds was completed in full by the end of 2019;
- For an amount of ¥26.0 billion in relation to the GB4 Offering, from 26 January 2017 to 31 December 2020, noting that the allocation of proceeds was completed in full in June 2020;
- For an amount of €2.4 billion in relation to the GB5 Offering, from 1 January 2017 to 31 December 2020 (including the "look-back" period), noting that €2,384 million were allocated as of December 31, 2020.

This information was prepared under your responsibility from the accounting records used for the preparation of the consolidated financial statements for the year ended 31 December 2020.

Our role is to report on:

- the compliance with the four components of the Green Bond Principles defined by the International Capital Market Association [(1)] being (i) the use of proceeds (ii) existing processes for evaluation and selection of the Eligible Projects (iii) the management of proceeds and (iv) the reporting;
- the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria defined in the Final Terms, as well as in the EDF Green Bond Framework updated in January 2020 (the "EDF Green Bond Framework");
- the tracking of the funds raised from the Green Bond Offerings, in a dedicated portfolio of financial assets, to the allocation of such funds to Eligible Projects and on the reconciliation of the amount of funds allocated to Eligible Projects as at 31 December 2020 as part of the Green Bond Offerings, with the accounting records and data underlying the accounting records;
- the compliance, in all material respects, of the methods used by the Company to estimate the CO_2 emissions avoided by the Eligible Projects financed as at 31 December 2020 with the methodology described in the section "Impact of financed Eligible Projects" of the attached document.

However, we have no responsibility:

- for challenging the eligibility criteria defined in the appendix to the Final Terms, as well as in the EDF Green Bond Framework and, in particular, we give no interpretation on the terms of the Final Terms and the EDF Green Bond Framework;
- for forming an opinion on the use of the allocated funds to Eligible Projects after such funds have been allocated;
- for concluding on whether the methodology used by the Company to estimate the avoided CO_2 emissions is appropriate.

In the context of our role as statutory auditor, we have audited, jointly with the other statutory auditor, the consolidated financial statements of the Company for the year ended 31 December 2020. Our audit was conducted in accordance with professional standards applicable in France, and was planned and performed for the purpose of forming an opinion on the consolidated financial statements taken as a whole and not on any individual component of the accounts used to determine the information. Accordingly, our audit tests and samples were not carried out with this objective and we do not express any opinion on any components of the accounts taken individually. These consolidated financial statements, which have not yet been approved by the Shareholders' Meeting, have been audited and our report thereon is dated 17 February 2021.

Furthermore, we have not performed any procedures to identify events that may have occurred after the date of our report on the consolidated financial statements of the Company which was issued on 17 February 2021.

Our engagement, which constitutes neither an audit nor a review, was performed in accordance with the professional guidance issued by the French Institute of Statutory Auditors (*Compagnie nationale des Commissaires aux comptes*). For the purpose of this attestation, our work consisted, using sampling techniques or other methods of selection, in:

For the information related to the Allocation of Proceeds and the compliance with the four components of the Green Bond Principles

- verifying the appropriate consideration of the four components of the Green Bond Principles of the International Capital Market Association being (i) the use of proceeds (ii) the existing processes for evaluation and selection of the Eligible Projects (iii) the management of proceeds and (iv) the reporting;
- understanding the procedures implemented by the Company for producing the information contained in the attached document;
- verifying the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria, as defined in the appendix to the Final Terms and in the EDF Green Bond Framework;
- verifying the appropriate segregation of the funds raised from the Green Bond Offerings and their exclusive allocation to Eligible Projects;
- verifying the global allocation of the capital expenditures incurred in relation to the Eligible Projects financed by each of the Green Bond Offerings;
- performing the necessary reconciliations between this information and the accounting records from which it is derived and verifying that the information agrees with the data used to prepare the consolidated financial statements for the year ended 31 December 2020.

(1) Green Bond Principles Voluntary Process - Guidelines for Issuing Green Bonds - June 2018

For the estimation of the avoided CO_2 emissions

- understanding and considering the methodology used to estimate the avoided CO_2 emissions;
- verifying the compliance, in all material respects, of the methods used to estimate the CO_2 emissions avoided by the Eligible Projects financed during the period with the methodology described in the section "Impact of financed Eligible Projects" of the attached document;
- verifying the consistency of the information related to the estimation of the electricity output as well as the choice of emission factors used (based on the calculation of the emission factors of the applicable electrical grids where the projects are located and the choice of emission factors by energy production technology), it being specified that there is no single framework defining a methodology for the calculation of avoided CO_2 emissions.

On the basis of our work, we have no matters to report on:

- the compliance with the four components of the Green Bond Principles of the International Capital Market Association;
- the compliance, in all material respects, of the Eligible Projects referred to in the attached document, with the eligibility criteria, as defined in the Final Terms and in the EDF Green Bond Framework;
- the tracking of the funds raised from the Green Bond Offerings, in a dedicated portfolio of financial assets, to the allocation of such proceeds to Eligible Projects and the consistency of the amount of allocated funds to Eligible Projects as at 31 December 2020 in the context of the Green Bond Offerings, with the accounting records and data underlying the accounting records;
- the compliance, in all material respects, of the methods used by the Company to estimate the CO_2 emissions avoided by the Eligible Projects financed as at 31 December 2020 with the methodology described in the section "Impact of financed Eligible Projects" of the attached document.

This attestation has been prepared solely for your attention within the context described above and may not be used, distributed or referred to for any other purpose.

Paris La Défense, 15 March 2021

One of the statutory auditors

Deloitte & Associés **Christophe Patrier Partner**

6.8 Information relating to the issue of OCEANEs Green bonds

Pursuant to the 24th resolution approved by the Company's Extraordinary General Meeting of 7 May 2020, EDF issued on 8 September 2020 bonds convertible into and/or exchangeable for new and/or existing shares (OCEANEs Green bonds), maturing on 14 September 2024, for a nominal amount of €2,399,999,989.27 consisting of 219,579,139 Bonds with a par value of €10.93 each. The bonds were offered in a public offering exclusively to qualified investors, within the meaning of Article 2(e) of Regulation (EU) 2017/1129 of 14 June 2017, in France and outside France, in accordance with the so-called order book construction procedure, as developed by professional practice, with the exception of the United States of America, Australia and Japan. The French State subscribed to 87,831,655 bonds in this issue, representing a nominal amount of approximately €960 million, corresponding to a subscription of approximately 40% of the issue. The framework and details of this issue are set out in the reports below.

6.8.1 Additional report of the Board of Directors relating to the issue of OCEANEs Green bonds (Articles L. 225-129-5 and R. 225-16 of the French Commercial Code)

Board of Directors of 6 November 2020

Ladies and Gentlemen, Dear Shareholders

In accordance with the provisions of Articles L. 225-129-5 and R. 225-116 of the French Commercial Code, we hereby report to you on the use of the delegation of authority granted by the Combined General Meeting of EDF shareholders (the **Company**) on 7 May 2020 under the terms of its 24th resolution, pursuant to which an issue of green bonds convertible into and/or exchangeable for new or existing shares of the Company was carried out by way of a public offering as referred to in Article L. 411-2, 1° of the French Monetary and Financial Code (known as a "private placement"), without preferential subscription rights (the "**OCEANEs Green bonds**").

We hereby inform you that the Board of Directors has granted a sub-delegation of Authority to the Chairman and Chief Executive Officer of the Company the power to decide on the issue of the OCEANEs Green bonds, in accordance with the provisions of Article L. 225-129-4, paragraph 1 of the French Commercial Code. In this respect, during the Board meeting of 6 November 2020, the Chairman and CEO reported on the use that had been made of this sub-delegation of authority, described the final terms and conditions of the issue of the OCEANEs Green bonds and submitted to the Board a draft supplementary report relating to the transaction.

In accordance with the aforementioned legal and regulatory provisions, we hereby present you with this supplementary report which describes the final terms and conditions of the issue of the OCEANEs Vertes, sets out the impact of said transaction on the Company's shareholders, as well as the theoretical impact of the issue on the market value of the EDF share.

1. Legal framework of the issue

1.1 Combined General Meeting of Shareholders on 7 May 2020

We remind you that the Combined General Meeting of shareholders of the Company of 7 May 2020 (the "**2020 General Meeting**"), ruling under the conditions of quorum and majority required for extraordinary general meetings, in accordance with the provisions of Articles L. 225-129 *et seq.* of the French Commercial Code, in particular L. 225-129-2 to L. 225-129-6, L. 225-131, L. 225-135, L. 225-136, Articles L. 228-91 *et seq.* of the French Commercial Code, has, in particular, under the terms of its 24th resolution:

(i) delegated to the Board of Directors, for a period of 26 months from the 2020 General Meeting, with the option to sub-delegate, its authority to increase the share capital of the Company by issuing ordinary shares or securities giving access to the share capital by way of a public offering as referred to in Article L. 411-2 of the French Monetary and Financial Code (known as a "private placement"), on one or more occasions, without preferential subscription rights for shareholders;

(ii) decided that the aggregate nominal amount of all debt securities that may be issued pursuant to the 24th resolution may not exceed, and shall be counted against, the ceiling of EUR 2.4 billion (or the equivalent value of this amount) relating to issues of debt securities, provided for in the eighth paragraph of the 22nd resolution adopted by the 2020 General Meeting, it being specified that (x) this ceiling is the same for all debt securities issued on the basis of the resolutions adopted by the 2020 General Meeting, and (y) the total nominal amount of the capital increase resulting from exercising the rights attached to the debt securities issued pursuant to the 24th resolution may not exceed, and shall be counted against, the ceilings defined in (iii) below;

(iii) decided that the maximum nominal amount of the immediate or future share capital increases that may be implemented pursuant to the 24th resolution may not exceed an overall ceiling of 290 million euros and the ceiling provided for by law (i.e., as of the date of the 2020 General Meeting, 20% of the share capital per year); it being specified that this amount shall be counted against (x) the limit of EUR 290 million relating to capital increases with or without preferential subscription rights, provided for in the fourth paragraph of the 23rd resolution adopted by the 2020 General Meeting, and, as a consequence, (y) the shared limit for capital increases with or without pre-emptive rights carried out pursuant to the resolutions adopted by the 2020 General Meeting, in the amount of EUR 365 million, provided for in the third paragraph of the 22nd resolution adopted by the 2020 General Meeting;

(iv) decided that the issue price of the securities giving access to the share capital, issued on the basis of the 24th resolution, shall be such that the amount received immediately by the Company, plus, if applicable, the amount that may be received subsequently by the Company, shall be, for each share issued as a result of the issue of these securities, at least equal to the minimum subscription price provided for by the regulatory provisions in force (i.e. the weighted average of the prices of the last three trading sessions on the Euronext Paris market preceding the start of the public offering within the meaning of Regulation (EU) 2017/1129 of 14 June 2017, possibly reduced by a maximum discount of 10%);

(v) authorised the Board of Directors, under the terms of its 25th resolution, for a period of 26 months as from the 2020 General Meeting and with the option to sub-delegate, to increase the number of securities to be issued in the event of an increase in the Company's share capital carried out with or without preferential subscription rights, in particular pursuant to the 24th resolution, at the same price as that used for the initial issue, within the time periods and limits provided for by the law and regulations applicable on the date of the initial issue (i.e., within 30 days of the close of the subscription and up to 15% of the initial issue); and

(vi) delegated to the Board of Directors, under the terms of the thirteenth paragraph of its 24th resolution, all powers, with the option to sub-delegate, to implement the delegation of authority granted under the terms of said resolution, in particular for the purpose of: setting the terms, conditions, procedures and dates of the issues; determining the number and characteristics of the securities to be issued pursuant to said resolution, including, with respect to debt securities, their ranking, their interest rate and the terms governing the payment of interest, the currency in which they are issued, their term and the procedures for their redemption and amortisation; setting the date of enjoyment, even retroactively, of the securities to be issued pursuant to said resolution; setting the terms and conditions under which the Company shall have the option, where applicable, to redeem or exchange the securities to be issued pursuant to said resolution; and requesting the admission to trading of the securities issued pursuant to said resolution wherever the Board of Directors may so decide.

1.2 Board of Directors of 7 September 2020

By virtue of this delegation, the Board of Directors, in its meeting of 7 September 2020, decided in particular:

(i) to authorize in principle: (x) the issue, by way of a public offering as referred to in Article L. 411-2, 1° of the French Monetary and Financial Code (known as a "private placement"), with cancellation of the shareholders' preferential subscription right and without a priority period, of a loan represented by the OCEANEs Green bonds, for a maximum nominal amount of 2.4 billion euros, and (y) the capital increase resulting from the possible conversion of the OCEANEs Green bonds into new ordinary shares of the Company, up to a maximum nominal amount of 290 million euros, not including the nominal amount of any additional shares to be issued to preserve the rights of holders of securities giving access to the capital, in accordance with the legal provisions in force or the terms of the OCEANEs Vertes;

(ii) that the OCEANEs Green bonds would be offered in an offering exclusively to qualified investors, within the meaning of Article 2(e) of Regulation (EU) 2017/1129 of 14 June 2017, in France and outside France, in accordance with the so-called order book construction procedure, as developed by professional practice, with the exception of the United States of America, Australia and Japan;

(iii) that the main terms and conditions governing the OCEANEs Green bonds would be set, in particular within the following limits:

- amount: the nominal amount of the loan represented by the OCEANEs Green bonds would be a maximum of 2.4 billion euros;
- premium: the unit par value of the OCEANEs Green bonds would result in a conversion premium of at least 25% over the volume-weighted average of the Company's share price on the regulated market of Euronext Paris ("**Euronext Paris**") as from the launch of the OCEANEs Green bonds offering until the time at which the final terms and conditions of the OCEANEs Green bonds are determined on the day of the launch of the issue;
- rate: the OCEANEs Green bonds would not bear interest;
- term: the maturity of the OCEANEs Green bonds would be between 3 and 5 years from the issue date;
- early redemption: the OCEANEs Green bonds might need to be redeemed by the Company in the event of a default or delisting of the Company, subject to certain conditions;
- adjustment of the conversion/exchange ratio: in addition to the cases of adjustment provided for by law, the conversion/exchange ratio of the OCEANEs Green bonds would be adjusted in particular in the event of a dividend distribution; and
- admission to trading: the OCEANEs Green bonds would be admitted to trading on the Euronext Access multilateral trading facility operated by Euronext in Paris ("**Euronext Access**").

The Board of Directors also decided, in accordance with the provisions of Article L. 225-129-4 of the French Commercial Code, under the conditions and within the limits set by the 24th resolution of the 2020 General Meeting, to sub-delegate to the Chairman and Chief Executive Officer, for a term expiring on 30 November 2020, the powers necessary to, inter alia: issue the OCEANEs Green bonds; set the final terms, conditions and procedures for said issue, including the timetable for the transaction; prepare a draft of the report provided for in Articles L. 225-129-5 and R. 225-116 of the French Commercial Code and submit said draft to the Board of Directors; and, more generally, with the option to sub-delegate, take any and all useful measures, enter into any and all agreements, request any and all authorisations, carry out any and all formalities, and do all that is necessary to successfully complete the planned issues.

1.3 Decisions of the Chairman and Chief Executive Officer of 8 September 2020

On 8 September 2020, the Chairman and Chief Executive Officer, acting pursuant to a sub-delegation of authority from the Board of Directors, in accordance with the 24th resolution of the 2020 General Meeting, the decision of the Board of Directors of 7 September 2020 and the provisions of Article L. 225-129-4 of the French Commercial Code, decided, inter alia:

(i) after ascertaining that the share capital of the Company has been fully paid up, to proceed with the launch by the Company of a bond issue represented by the OCEANEs Green bonds, by way of a public offering referred to in Article L. 411-2, 1° of the French Monetary and Financial Code (known as a "private placement"), with cancellation of the shareholders' preferential subscription right and without a priority period, subject to market conditions;

(ii) that the placement of the OCEANEs Green bonds would take place on the same day, in the context of a public offering exclusively to qualified investors, within the meaning of Article 2(e) of Regulation (EU) 2017/1129 of 14 June 2017, in France and outside France, in accordance with the procedure known as the order book construction procedure, as developed by professional practices, with the exception of the United States of America, Australia and Japan;

(iii) to set the indicative terms for the OCEANEs Green bonds;

(iv) to adopt the indicative terms and conditions of the OCEANEs Green bonds;

(v) that the final terms for the issue (in particular the number of OCEANEs Green bonds to be issued, their par value per unit and the redemption yield) would be determined at the end of the order book construction procedure referred to above and would be the subject of a subsequent decision by the Chairman and Chief Executive Officer;

(vi) that the proceeds of the issue of the OCEANEs Green bonds shall be used, inter alia, to finance or refinance, in whole or in part, either directly or indirectly, eligible investments in accordance with the Company's *Green Bond Framework*; and

(vii) to request that the OCEANEs Green bonds be admitted to trading on Euronext Access.

The underwriters of the transaction thus proceeded with the placement of the OCEANEs Green bonds, in a public offering exclusively to qualified investors, within the meaning of Article 2(e) of Regulation (EU) 2017/1129 of 14 June 2017, in France and outside France, in accordance with the order book construction procedure, as developed by professional practice, with the exception of the United States of America, Australia and Japan, in accordance with the rules specific to each country in which the placement was made under the aforementioned procedure.

On the same day, using the powers granted to him by the Board of Directors on 7 September 2020, in accordance with the 24th resolution of the 2020 General Meeting, the decision of the Board of Directors of 7 September 2020 and the provisions of Article L. 225-129-4 of the French Commercial Code, after ascertaining that the Company's share capital was fully paid up and that, since 7 May 2020, no decision to issue securities had been taken pursuant to the delegations of authority granted under the 22nd to the 30th resolutions adopted by the 2020 General Meeting, the Chairman and Chief Executive Officer of the Company, at the end of the order book construction procedure, determined the final terms for the OCEANEs Green bonds, certain characteristics of which are summarised below, and decided to proceed with the issue of the OCEANEs Green bonds in accordance with such terms (the "**Issue**").

2. Final terms and conditions of the issue

2.1 Characteristics of the offering

Nominal amount of the Issue	**2,399,999,989.27 euros.**
Net proceeds of the Issue	2,558,334,835.86 euros.
Number of OCEANEs Green bonds issued	219,579,139 OCEANEs Green bonds.
Par value per unit of the OCEANEs Green bonds	10.93 per OCEANE Green bond, representing a conversion premium of 32.5% over the reference price of the Company's ordinary shares on Euronext Paris. This reference price is equal to the volume-weighted average of the EDF share price recorded on Euronext Paris from the launch of the issue on 8 September 2020 until the determination of the final terms and conditions governing the OCEANEs Green bonds, i.e. 8.2465 euros.
Public offering	Public offering exclusively to qualified investors, within the meaning of Article 2(e) of Regulation (EU) 2017/1129 of 14 June 2017, in France and outside France, in accordance with the so-called order book construction procedure, as developed by professional practice, with the exception of the United States of America, Australia and Japan (as referred to in Article L. 411-2, 1° of the French Monetary and Financial Code).
Subscription of major shareholders	The French State subscribed to the Issue for a nominal amount of 960 million euros, representing 40% of the Issue.
Preferential subscription rights - Priority period	Not applicable.
Issue price of the OCEANEs Green bonds	107% of the par value, i.e. EUR 11.70 per bond.
Date of issue and settlement of the OCEANEs Green bonds	14 September 2020 (the "**Issue Date**").
Listing of the OCEANEs Green bonds	Since 14 September 2020, on the Euronext Access™ multilateral trading facility operated by Euronext in Paris under ISIN code FR0013534518.
Clearing	Euroclear France / Euroclear Bank S.A./N.V. / Clearstream Banking S.A. (Luxembourg).
Structuring Agent - Bookrunner	BNP Paribas, acting as structuring agent; BNP Paribas, Crédit Agricole Corporate and Investment Bank, J.P. Morgan Securities plc, BofA Securities Europe S.A., Goldman Sachs International, Morgan Stanley & Co. International plc, acting as joint bookrunners; and Crédit Industriel et Commercial S.A., MUFG Securities (Europe) N.V. and Natwest Markets plc, acting as co-bookrunners.
Intermediary(-ies) responsible for the securities service and the financing service	BNP Paribas Securities Services is responsible for the securities service and for centralising the financial service of the loan. Calculation agent services are provided by Conv-Ex Advisors Limited.
Undertaking to refrain from issuing shares or instruments giving access to capital	90 calendar days after the Issue Date.

2.2 Characteristics of the OCEANEs Green bonds

Ranking of the OCEANEs Green bonds	**The OCEANEs Green bonds constitute direct, unconditional, unsecured, unsubordinated obligations of the Company, ranking without preference among themselves and, subject to certain legal exceptions, pari passu with the Company's other present or future unsubordinated and unsecured obligations.**
Maintaining the ranking of the OCEANEs Green bonds	As long as the OCEANEs Green bonds are outstanding, the Company shall not grant a security interest in any of its present or future assets or income to secure any indebtedness in the form of financial securities, nor shall it grant any guarantee or indemnity in respect of any such indebtedness, unless the OCEANEs Green bonds benefit at the same time from the same security interests.
Nominal rate - Interest	The OCEANEs Green bonds do not bear interest.
Rating of the Issue	The Issue has not been the subject of a rating request.
Term of the loan	4 years from the settlement date of the OCEANEs Green bonds.
Maturity date of the OCEANEs Green bonds	14 September 2024 (the "**Maturity Date**").
Normal amortisation of the OCEANEs Green bonds	Unless previously converted, exchanged, redeemed or bought-back and cancelled, the OCEANEs Green bonds shall be redeemed in full at par on the Maturity Date (or the first business day thereafter if such date is not a business day).
Early amortisation of the OCEANEs Green bonds at the discretion of the Company	The Company may elect to redeem early the OCEANEs Green bonds in full and at par: at any time, without limitation as to price or quantity, by way of a buy-back on or off the stock exchange or by way of redemption or exchange offers; at any time, subject to 30 to 60 calendar days' notice, by redemption at par of all outstanding OCEANEs Green bonds, in the event that: – as from 14 September 2022, inclusive, until the Maturity Date, exclusive, the arithmetic average of the weighted average prices of the EDF share recorded on Euronext Paris (calculated over a period of 20 consecutive trading days chosen by the Company from among the 40 consecutive trading days preceding the date of publication of the notice of early redemption) multiplied by the conversion/exchange ratio (over the same period) exceeds 130% of the par value of the OCEANEs Green bonds; or – the number of outstanding OCEANEs Green bonds is less than 20% of the number of OCEANEs Green bonds initially issued.
Accelerated maturity of the OCEANEs Green bonds	Possible, at par value, in the event of the occurrence of certain events ((*e.g.* breach of the terms and conditions of the OCEANEs Green bonds by the Company), triggered by a decision of the General Meeting of the holders by a two-thirds majority.
Early amortisation at the discretion of the holders of OCEANEs Green bonds in the event of delisting	Possible, at par value, triggered by a decision of the General Meeting of the holders by a two-thirds majority
Rights attached to the OCEANEs Green bonds / Share Allotment Right	**Nature of the Share Allotment Right** Holders of OCEANEs Green bonds shall have a right to convert or exchange their OCEANEs Green bonds into new and/or existing shares of the Company (the **Share Allotment Right**"). **Exercise Period for the Share Allotment Right** At any time from and including the day after the ninetieth day following the Issue Date (*i.e.* 14 December 2020) until and including the seventh business day preceding the Maturity Date or the early redemption date. **Terms governing the distribution of the ordinary shares delivered in the event of the exercise of the Share Allotment Right** On the Issue Date of the OCEANE Green bonds, the conversion and/or exchange ratio of the OCEANEs Green bonds is one share per OCEANE Green bonds, subject to customary adjustments, including anti-dilution adjustments and adjustments related to the payment of a dividend, as described in the terms and conditions of the OCEANEs Green bonds (the "**Share Allotment Ratio**"). In the event that said right is exercised, the holders of OCEANEs Green bonds shall receive, at the discretion of the Company, new shares of the Company, existing shares or a combination of both. The total number of new and/or existing ordinary shares of the Company shall be determined by the calculation agent and shall be equal, for each holder of OCEANEs Green bonds, to the Share Allotment Ratio in effect on the Date of Exercise multiplied by the number of OCEANEs Green bonds transferred to the centralising agent for which the Share Allotment Right has been exercised. **Suspension of the Share Allotment Right** In the event of a capital increase or the issue of new shares in the Company or securities giving access to the Company's share capital or any other financial transaction involving a preferential subscription right or reserving a priority subscription period in favour of the Company's shareholders, as well as in the event of a merger or demerger, the Company reserves the right to suspend the exercise of the Share Allotment Right for a period which may not exceed three months or any other period set by the applicable regulations, the exercise of said option shall in no event cause the holders of OCEANEs Green bonds to lose their Share Allotment Right.
Enjoyment and listing of the underlying shares	The new shares shall be entitled to current dividends from the date on which they are delivered. They shall be immediately treated as existing shares and shall be subject to periodic requests for admission to trading on Euronext Paris, on the same trading line as the existing shares. The existing shares delivered as a result of the exchange of the OCEANEs Green bonds shall carry current dividend rights as from the date of their delivery, shall be listed on Euronext Paris and shall be immediately tradable on the stock exchange.
Currency of the issue	Euro.
Governing Law	French Law.

3. Purpose of the issue

An amount equal to the net proceeds of the Issue shall be used, directly or indirectly, to finance and/or refinance, in whole or in part, new or existing eligible projects as defined in EDF's *Green Bond Framework*. The existing eligible projects that may be refinanced through this Issue, with a maximum look-back period of three years preceding the year of Issue of the OCEANEs Green bonds, represent approximately €1.5 billion, in accordance with EDF's *Green Bond Framework*.

This issue may also contribute to the strengthening of the Company's shareholders' equity, in the event that the holders of the OCEANEs Green bonds exercise their conversion option, resulting in the issue of new shares of the Company.

4. Impact of the issue of the OCEANEs Vertes and the exercise of the share allotment right on the position of holders of equity securities and securities giving access to the capital

4.1 Dilution in the event of delivery of new ordinary shares of the Company - Effect of the issue on the proportion of equity for the Company's shareholders

The following table sets out, for illustrative purposes, the impact of the issue of new ordinary shares on the proportionate share of equity per share in the event that the Share Allotment Right is exercised for all of the OCEANEs Green bonds and the Company chooses to deliver only new ordinary shares of the Company.

The calculations are made on the basis of:

(i) equity as shown in the company and consolidated financial statements as at 30 June 2020;

(ii) 3,098,609,774 shares on an undiluted basis as at 30 June 2020, i.e. 3,103,621,086 shares making up the share capital at said date less 5,011,312 treasury shares held at 30 June 2020; and

(iii) assuming a Share Allotment Ratio of 1.

	Prior to the issue	After the issue and conversion of the OCEANEs Green bonds
Parent company shareholders' equity of EDF S.A. (in euros)	38,932,716,919.38	41,491,051,755.27[1]
Consolidated shareholders' equity (group share) (in million euros)	44,864	47,422[1]
Number of shares - undiluted basis	3,098,609,774	3,318,188,913
Number of shares - diluted basis [2]	3,098,609,774	3,318,188,913
Share of parent company shareholders' equity per share - undiluted basis	€12.56	€12.50
Share of parent company shareholders' equity per share - diluted basis	€12.56	€12.50
Share of consolidated shareholders' equity per share - undiluted basis	€14.48	€14.29
Share of consolidated shareholders' equity per share - diluted basis	€14.48	€14.29

4.2 Dilution in the event that new ordinary shares of the Company are delivered - Impact of the issue on the position of the Company's shareholders

The following table sets out, for illustrative purposes, the impact of the issue of new ordinary shares on the stake of a shareholder who has not subscribed to the issue of the OCEANEs Green bonds and who holds 1% of the share capital of the Company as at 30 June 2020, in the event that the Share Allotment Right is exercised for all of the OCEANEs Green bonds and the Company chooses to deliver only new ordinary shares of the Company.

The calculations are made on the basis of:

(i) 3,103,621,086 shares making up the Company's share capital as at 30 June 2020; and

(ii) assuming a Share Allotment Ratio of 1.

Shareholder stake *(as a%)*	Prior to the issue	After the issue and conversion of the OCEANEs Green bonds
Undiluted basis	1%	0.93%
Diluted base[3]	1%	0.93%

(1) The nominal amount of the Issue is 2,399,999,989.27 euros and the net proceeds of the Issue are 2,558,334,835.86 euros.

(2) Assuming that there are no dilutive instruments other than the OCEANEs Green bonds.

(3) Assuming that there are no dilutive instruments other than the OCEANEs Green bonds.

5. Impact of the issue of the OCEANEs Green bonds and the exercise of the right to be allotted shares on the market value of the EDF share

The theoretical impact of the issue and conversion of the OCEANEs Green bonds on the market value of the EDF share is +2.11% on a non-diluted basis and +2.11% on a diluted basis.

It was calculated on the basis of:

- a market price of 8.8275 euros per share of the Company, which is equal to the average of the closing prices of the twenty trading sessions preceding 8 September 2020 (launch date of the Issue);
- the issue of 219,579,139 OCEANEs Green bonds with a par value of 10.93 euros, and the conversion of all of said bonds into 219,579,139 new ordinary shares of the Company (1 ordinary share for 1 OCEANE Green bond);
- net proceeds of the issue of 2,558,334,835.86 euros.

The table below sets out, using the above assumptions, the theoretical impact of the issue and conversion of the OCEANEs Green bonds on the market value of the EDF share:

Theoretical impact of the issue and conversion of the OCEANEs Green bonds on the market value of the EDF share	
Issue of the OCEANEs Green bonds	
Number of OCEANEs Green bonds issued	219,579,139
Share Allotment Ratio	1
Net proceeds from the issue of the OCEANEs Green bonds	€2,558,334,835.86
Total number of ordinary EDF shares likely to be created through the conversion of the OCEANEs Green bonds	219,579,139
Position before the issue of the OCEANEs Green bonds (undiluted basis)	
Number of EDF shares before the issue of the OCEANEs Green bonds	3,103,621,086
Market value of an EDF share resulting from the average of the closing prices of the twenty trading days preceding 8 September 2020	€8.8275
Market value of EDF before the Issue	€27,397,215,137
Position after the issue and conversion of the OCEANEs Green bonds (undiluted basis)	
Total number of EDF shares after the issue and conversion of the OCEANEs Green bonds	3,323,200,225
Theoretical value of an EDF share after the issue and conversion of the OCEANEs Green bonds	€9.0141
Theoretical market value of EDF after the issue and conversion of the OCEANEs Green bonds	€ 29,955,549,973
Theoretical impact of the issue and conversion of the OCEANEs Green bonds	2.11%
Position after the issue and conversion of the OCEANEs Green bonds (diluted basis[1])	
Total number of EDF shares after the issue and conversion of the OCEANEs Green bonds	3,323,200,225
Theoretical value of an EDF share after the issue and conversion of the OCEANEs Green bonds	€9.0141
Theoretical market value of EDF after the issue and conversion of the OCEANEs Green bonds	€29,955,549,973
Theoretical impact of the issue and conversion of the OCEANEs Green bonds	2.11%

Done in Paris, 6 November 2020

The Board of Directors

(1) Assuming that there are no dilutive instruments other than the OCEANEs Green bonds.

6.8.2 Statutory Auditors' supplementary report on the issue of bonds convertible into and/or exchangeable for new or existing shares of the Company, with cancellation of preferential subscription rights

This is a free translation into English of the Statutory Auditors' supplementary report issued in French and it is provided solely for the convenience of English speaking users. This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

Decisions of the Chairman and Chief Executive Officer of 8 September 2020 by sub-delegation of the Board of Directors meeting of 7 September 2020

To the Shareholders,

In our capacity as Statutory Auditors of your Company (the "Company") and pursuant to Article R. 225-116 of the French Commercial Code (*Code de commerce*), we hereby present a report supplementing our report of 6 April 2020 on the issue, in France and abroad, with cancellation of preferential subscription rights, by way of a public offer referred to in paragraph 1 of Article L. 411-2 of the French Monetary and Financial Code (*Code monétaire et financier*) ("*via* a private placement"), and for up to 20% of the share capital per year, (i) of ordinary shares of the Company, (ii) of marketable securities of any kind, issued in return for payment or free of charge, granting access by any means, immediately or in the future, to existing or future shares of the Company and/or (iii) of marketable securities of any kind, issued in return for payment or free of charge, granting access by any means, immediately or in the future, to existing or future shares of a company in which the Company holds, directly or indirectly, more than half of the capital, authorized by your Combined Shareholders' Meeting of 7 May 2020, in its twenty-fourth resolution.

This Shareholders' Meeting had granted your Board of Directors the authority, with the option of sub-delegation, to decide such a transaction within a period of 26 months. The overall par amount of share capital increases that may be carried out, immediately or in the future, may not exceed €290 million, this amount being deducted from the limit of €290 million set in the twenty-third resolution and the overall limit of €365 million set in the twenty-second resolution. The overall nominal amount of debt securities that may be issued may not exceed, and is deducted from, the overall limit of €2.4 billion set in the twenty-second resolution.

Using this delegation, on 7 September 2020, your Board of Directors decided:

a) on the principle of (i) an issue, by way of a public offer referred to in paragraph 1 of Article L. 411-2 of the French Monetary and Financial Code ("*via* a private placement"), with cancellation of shareholder preferential subscription rights and no priority period, exclusively reserved for qualified investors within the meaning of Article 2, point e), of regulation (EU) 2017/1129 of 14 June 2017, in France and abroad (with the exception of the United States of America, Australia and Japan), according to a book-building process, as developed by professional practice, of a loan represented by "green" bonds convertible into and/or exchangeable for new or existing shares of the Company ("Green OCEANE Bonds"), for a maximum nominal amount of €2.4 billion and (ii) a share capital increase following the potential conversion of the Green OCEANE Bonds into new ordinary shares of the Company, for up a maximum par value amount of €290 million, not taking into account the par value of any additional shares to be issued to safeguard the rights of holders of securities granting access to share capital, in accordance with prevailing legal provisions or the terms and conditions of the Green OCEANE Bonds;

b) that the main terms and conditions of the Green OCEANE Bonds would be determined within the following limits:

- amount: the maximum nominal amount of the loan represented by the Green OCEANE Bonds would be €2.4 billion;
- premium: the unit nominal value of the Green OCEANE Bonds would result in a conversion premium of at least 25% compared to the volume-weighted average of the Company's share price observed on the Paris Euronext regulated market from the launch of the Green OCEANE Bonds offering until the setting of their final terms and conditions on the issue date;
- interest rate: the Green OCEANE Bonds do not bear interest;
- maturity: the maturity of the Green OCEANE Bonds would be between 3 and 5 years from the issue date.

The Board of Directors also decided to sub-delegate to the Chairman and Chief Executive Officer, for a period up to 30 November 2020, the necessary powers to perform the issue.

Using this sub-delegation, on 8 September 2020, following the book-building with qualified investors, your Chairman and Chief Executive Officer issued 219,579,139 Green OCEANE Bonds, each with a nominal value of €10.93, representing an issue premium of 32.5% compared to the volume-weighted average of the Company's share price observed on the Paris Euronext regulated market from the launch of the issue on 8 September 2020 until the setting of the Green OCEANE Bonds final terms and conditions, for a total nominal amount of €2,399,999,989.27. The settlement date of the Green OCEANE Bonds was 14 September 2020, at an issue price equal to 107% of the nominal value, *i.e.* €11.70 per Green Bond.

Each Green Bond may be converted into and/or exchanged for one (1) new or existing share, with a par value of €0.50. The maximum par value amount of the share capital increase that may result from the conversion of the Green OCEANE Bonds is €109,789,570. The Green OCEANE Bonds do not bear interest and shall expire on 14 September 2024, except in the event of early redemption or repayment.

It is the responsibility of the Board of Directors to prepare a supplementary report in accordance with Articles R. 225-115 *et seq.* and Article R. 22-10-31 of the French Commercial Code. Our role is to express an opinion on the fair presentation of the quantified information extracted from an interim financial position, on the proposed cancellation of preferential subscription rights and on certain other information concerning the issue, contained in this report.

We conducted the procedures that we deemed necessary in accordance with the professional guidelines of the French National Institute of Statutory Auditors (Compagnie Nationale des Commissaires aux Comptes) relating to this engagement. These procedures consisted in verifying:

the fair presentation of the quantified information extracted from the Company's interim financial position and the condensed consolidated financial statements prepared under the responsibility of the Board of Directors for the half-year ended 30 June 2020, in accordance with the same methods and presentation adopted in the most recent annual and consolidated financial statements. Our review of the Company's interim financial position consisted in making inquiries of persons responsible for financial and accounting matters, verifying that the it was prepared in accordance with the same accounting principles and the same valuation and presentation methods as the most recent annual financial statements and applying analytical procedures; The condensed half-year consolidated financial statements were reviewed by us in accordance with professional standards applicable in France;

- the compliance of the transaction terms and conditions with the delegation granted by the Shareholders' Meeting;
- the information presented in the Board of Directors' supplementary report on the choice of inputs used in the calculation of the issue price of the shares to be issued and the definitive amount.

We have no comments to make on:

- the fairness of the quantified information extracted from the Company's interim financial position and the condensed half-year consolidated financial statements and presented in the Board of Directors' supplementary report of 6 November 2020;
- the compliance of the transaction terms and conditions with the delegation granted by the Combined Shareholders' Meeting of 7 May 2020 and the information presented to shareholders;

We have the following comment on the Board of Directors' supplementary report: this report specifies that the issue price of the Green OCEANE Bonds and therefore the shares to be issued was set at the end of the standard book-building with qualified investors. This issue price is – by definition – the result of the supply and demand for the securities.

Therefore, we cannot express an opinion on the issue price calculation inputs for the shares to be issued and the definitive amount, the presentation of the issue's impact on the situation of holders of equity securities assessed in relation to equity, the share price, and, accordingly, the cancellation of preferential subscription rights previously submitted for your approval.

Pursuant to the law, we inform you that this supplementary report could not be made available to shareholders within the timeframe stipulated in Article R. 225-116 of the French Commercial Code.

Paris La Défense, 10 March 2021

The Statutory Auditors

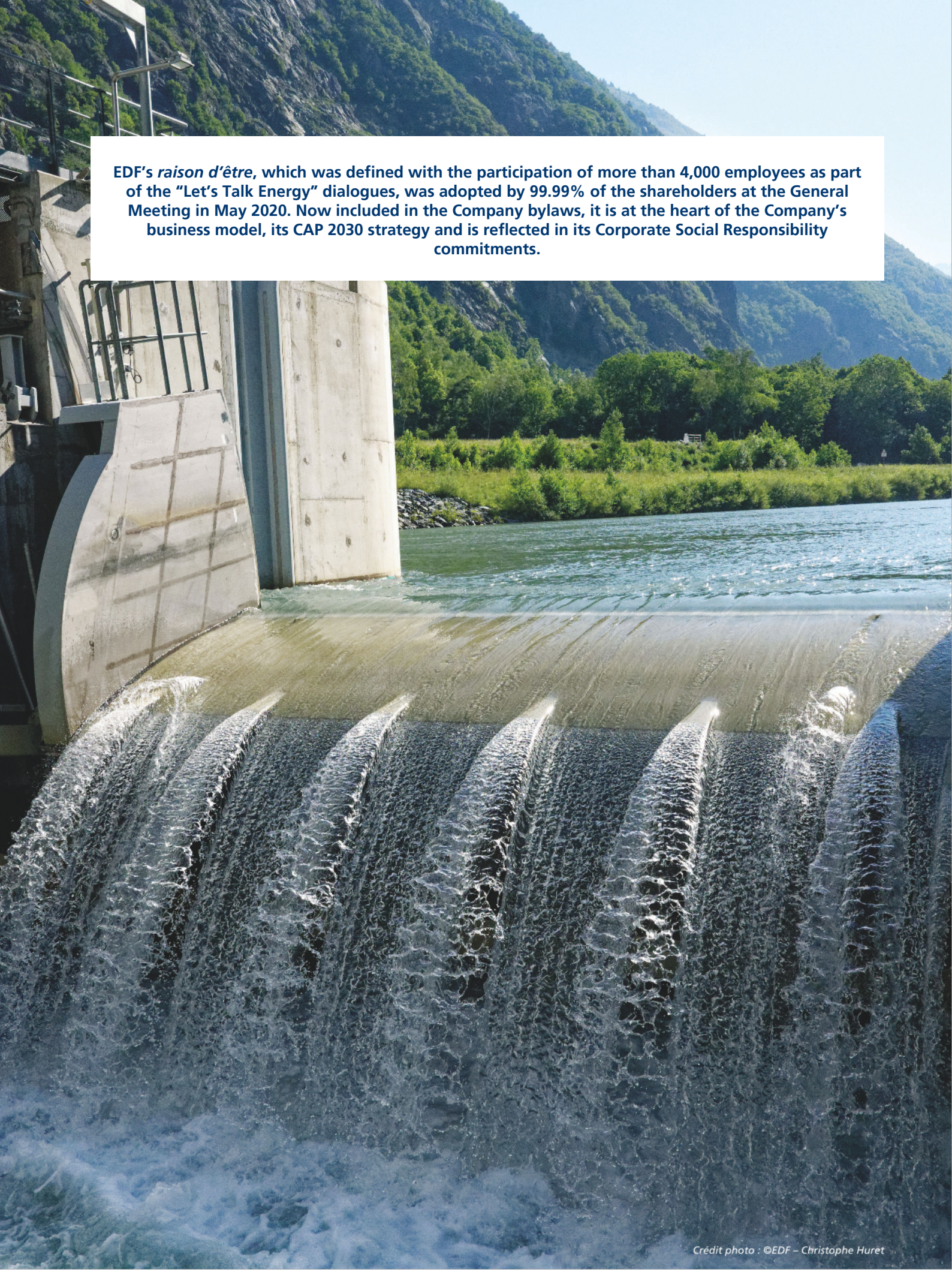
KPMG S.A.

Jay Nirsimloo Michel Piette

Deloitte & Associés

Damien Leurent Christophe Patrier

EDF's *raison d'être*, which was defined with the participation of more than 4,000 employees as part of the "Let's Talk Energy" dialogues, was adopted by 99.99% of the shareholders at the General Meeting in May 2020. Now included in the Company bylaws, it is at the heart of the Company's business model, its CAP 2030 strategy and is reflected in its Corporate Social Responsibility commitments.



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7.1 General information about the Company

7.1.1 Company name, address and telephone number of the registered office

The name of the Company is: "Électricité de France". The Company may also be legally designated by the acronym "EDF".

The Company's registered office is at 22-30 Avenue de Wagram in the 8th *arrondissement* of Paris.

The telephone number is 33(0) 1 40 42 22 22.

7.1.2 Trade and Companies Registry, APE code

The Company is registered with the Paris Trade and Companies Registry under number 552 081 317. Its APE code is 401E.

7.1.3 Date of incorporation and term of the Company

EDF was incorporated pursuant to Act no. 46–628 of 8 April 1946 as a French public industrial and commercial establishment (EPIC). It was converted into a French *société anonyme* (public limited company) by the Act of 9 August 2004 and the Decree of 17 November 2004.

The Company was incorporated for a term of 99 years as from 19 November 2004, unless the Company is dissolved before such date or unless its term is extended.

7.1.4 Legal form and applicable legislation

Since 20 November 2004, EDF has been a French *société anonyme* with a Board of Directors. It is governed by the laws and regulations applicable to commercial companies, in particular the French Commercial Code, except in the event of specific exceptions stipulated in the French Energy Code or Order no. 2014-948 of 20 August 2014 on the governance and capital transactions of companies with State holdings and by its articles of association.

7.1.5 Disputes

This section describes the main legal proceedings except the one covered in note 5 and 17.3 to the consolidated financial statements and any material developments in those proceedings that have occurred between the approval of the financial statements and the filing date of this document.

To the knowledge of the Company, there are no administrative, legal or arbitration proceedings (including any pending or threatened proceedings of which the Company is aware) likely to have or having had in the past 12 months a material impact on the financial situation or the profitability of the Company and/or the Group with the exception of those described below and those described in the notes to the 2020 consolidated financial statements.

Investigations by France's Competition Authority ("ADLC")

France's Competition Authority is currently investigating the EDF group in relation to four separate matters. The first, relating to the commercial practices of EDF and certain of its subsidiaries in the energy services markets, follows a complaint filed on 17 October 2016 by Xélan. Following this complaint, France's Competition Authority conducted search and seizure operations at the premises of EDF and several of its subsidiaries on 22 and 23 November 2016. EDF and its subsidiaries lodged appeals with the Court of Appeal in Versailles challenging the search and seizure procedures. In orders issued on 12 April 2018 and 10 January 2019, the President of the Court of Appeal in Versailles dismissed the appeals against the order authorising the search and seizure procedures and against the manner in which those were conducted. The appeal to the French Supreme Court by EDF and its subsidiaries was dismissed by a decision dated 20 January 2021. The second investigation, relating to EDF's commercial practices in the retail energy supply markets, following a complaint filed by Engie relating, in particular, to the circumstances in which EDF gave access to customer data to electricity suppliers that requested access from the end of 2015, relating to customers supplied energy under the regulated Green and Yellow tariffs, as part of the discontinuation of these tariffs. The third legal proceeding, relating to EDF's pricing policy for its electricity supply offers to non-residential customers with a connection capacity of less than 36kVa, follows a complaint by Plüm Energie dated 14 September 2020. This complaint is accompanied by an application for precautionary measures, regarding which the ADLC will rule at the beginning of 2021. The fourth legal proceeding follows an ex-officio referral from the ADLC dated 4 November 2019. This proceeding pertains to the formation of a partnership by a subsidiary in the field of heating network operation.

AMF Investigation

As part of an AMF investigation into financial information provided to the markets since July 2013, the AMF notified EDF of two grievances on 5 April 2019, which EDF challenged. On 28 July 2020, the AMF Commission des sanctions (Enforcement Committee) imposed financial penalties of €5 million on EDF and €50,000 on its former Chairman and Chief Executive Officer for a failure consisting in the dissemination of false or misleading information in connection with the construction of the Hinkley Point C nuclear power plant in a press release dated 21 October 2013 entitled "Agreement on the Commercial Terms of Contracts for the Hinkley Point C Nuclear Power Plant Project". EDF lodged an appeal against this ruling.

In contrast, the Enforcement Committee ruled out any breach of the obligation to disclose as soon as possible inside information relating to EDF's decision to pursue the Hinkley Point C project as part of the full consolidation in the Group's financial statements, which was disclosed to the market on 21 September 2015, thereby exonerating both EDF and its current Chairman and Chief Executive Officer in this respect.

CRE/REMIT investigation

On 1 December 2016, the CRE (French Energy Regulation Commission) launched an investigation into whether EDF and its subsidiaries EDF Trading Limited and EDFT Markets Limited were guilty of engaging, since 1 April 2016, in practices that could constitute breaches of the provisions of regulation (EU) no. 1227/2011 of 25 October 2011 on wholesale energy market integrity and transparency (REMIT). The CRE informed EDF by letter dated 5 July 2018 that it had referred the matter to the Settlement of Disputes and Sanctions Committee (CoRDiS). There is no indication as to the outcome of the proceedings.

The Dutch Authority for Consumers and Markets (ACM) has opened an investigation into the availability of the Sloe power plant (gas-fired combined cycle power plant based in the Netherlands). On 19 November 2020, EDF and EDF Trading Limited received a notification of ACM's grievances. There is no indication as to the outcome of the proceedings.

Appeals by NGOs and associations against administrative authorisations related to the generation plants

A certain number of authorisations and permits related to the Group's generation plants (ASN (Nuclear Safety Authority), decisions by the Prefecture, decrees, orders, etc.) have been challenged before the courts, mainly by environmental associations.

7.1.6 EDF, a public undertaking with a public service mission

7.1.6.1 EDF as a public undertaking

As an undertaking in which the French State holds a majority share (see section 7.2.9), EDF is subject to the provisions of Order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding and its application Decree no. 2014-949 of the same date.

In accordance with the legislation that applies to all undertakings of which the State is a majority shareholder, EDF may have to undergo certain State audit procedures, in particular through an economic and financial evaluation assignment, pursuant to Decree no. 55-733 of 26 May 1955 on State economic and financial evaluation and Decree no. 53-707 of 9 August 1953 on State evaluation of national public undertakings and certain organisations, the purpose of which has an economic or social component.

EDF also has to undergo the audit procedures performed by the French General Accounting Office (Cour des comptes) and the Parliament. Thus, in addition to the control performed by the Statutory Auditors, the Company's accounts and management and, if applicable, those of its directly-held majority subsidiaries, fall under the control of the French General Accounting Office, in accordance with Articles L. 111-4, L. 133-1 and L. 133-2 of the French Code of Financial Jurisdictions.

Lastly, the disposal of EDF shares by the State, or the dilution of the State's stake in EDF's capital, is subject to a specific procedure under Order no. 2014-948 of 20 August 2014 on the governance and equity transactions of companies with a public shareholding.

As a buyer, EDF is governed by the French Public Procurement Code.

7.1.6.2 Public service in France

Statutory definition of public service in France

Articles L. 121-1 et seq. of the French Energy Code outline the framework for the public electricity sector.

Public service missions

Articles L. 121-1 et seq. of the French Energy Code state that the public electricity service must provide a balanced supply of electricity, develop and operate public electricity networks and supply electricity at regulated sales tariffs.

Balanced development of electricity supply mission

The purpose of developing a balanced supply of electricity, which is defined in Article L. 121-3 of the French Energy Code, is to achieve the objectives defined in the multi-year energy programme (PPE). The PPE was defined by decree and sets out priority courses of action for the public authorities for the management of all forms of energy in continental metropolitan France. It must be compatible with the greenhouse gas emission reduction targets set in the carbon budget and the low carbon strategy, which are defined by Decree no. 2020-457 of 21 April 2020.

It defines the quantitative objectives for the plan and the maximum indicative budget for the public funds that will be allocated by the State and its public institutions in order to attain them. It may be broken down by objective and by industry sector.

Decree n°2020-456 of 21 April 2020 set the multi-year energy programme for 2019-2023 period and 2024-2028 period.

Pursuant to the law, EDF prepared a Corporate Strategy Plan (PSE) presenting the actions that the Company commits to implementing in order to meet the security of supply and electricity generation diversification objectives defined in the first period of the PPE. On 14 October 2020, the PSE was submitted for approval by the Minister for Energy.

The 'Climate and Energy' Act of 8 November 2019 also specifies the procedure concerning the Strategic Business Plan (PSE), which will have to cover both periods of the Multi-year Energy Programme (PPE), be made public (with the exception of information relating to business secrecy), and present the accompanying measures put in place for employees as a result of the closure of nuclear or thermal power stations. In the event that the Strategic Business Plan (PSE) is incompatible with the Multi-year Energy Programme (PPE), the act provides for a formal notice followed, if necessary, by sanctions.

The mission relating to the balanced development of electricity supply also involves guaranteeing supply in areas that are not interconnected to continental metropolitan France (Corsica, and the overseas départements and territories, as well as some islands in Brittany). Corsica, Guadeloupe, French Guiana, Martinique, Mayotte, La Réunion, and Saint-Pierre-et-Miquelon will each have their own specific PPE. Other areas that are not interconnected with the continental metropolitan network, except for Saint Martin and Saint Barthélemy, will be subject to a section appended to the PPE for continental metropolitan France.

As a power producer, EDF, along with the other producers, contributes to the performance of this mission.

Mission to develop and operate public transmission and distribution networks

The mission to develop and operate the public electricity transmission and distribution networks, which is defined in Article L. 121-4 of the French Energy Code, involves ensuring:

- a rational electricity distribution service in France through the public transmission and distribution networks, in a way that is environmentally friendly, the interconnection with neighbouring countries;
- connection and access to the public transmission and distribution networks, under non-discriminatory conditions.

Public network operators are designated by law to carry out this duty: RTE for transport, Enedis and Local Distribution Companies (Entreprises Locales de Distribution, or LDCs) for distribution, EDF in zones that are not interconnected to the continental metropolitan network.

Mission to supply electricity

The public service mission to supply electricity, which is defined in Article L. 121-5 of the French Energy Code, involves ensuring the supply of electricity throughout France to customers who benefit from regulated electricity sales tariffs.

By law, this mission has been entrusted to EDF and to the LDCs.

The conditions under which customers can benefit from regulated electricity sales tariffs are defined in Articles L. 337-7 et seq. of the French Energy Code.

The mission to supply electricity also includes supplying emergency power to customers connected to public networks, if their supplier is unable to supply power or has had its licence withdrawn or suspended.

Social cohesion

Article L. 121-5 of the French Energy Code provides that the supply of electricity at regulated tariffs must contribute to social cohesion, in particular through the national equalisation of regulated electricity sale tariffs and tariff entitlement.

Article L. 115-3 of the French Social Action and Families Code prohibits electricity suppliers from cutting off electricity supplies to the primary residences of individuals or families during the winter period (from 1 November to 31 March) due to unpaid bills, including through contract termination. Electricity suppliers may, nevertheless, in certain cases, reduce the power supplied, except with regard to customers who benefit from "energy vouchers". These vouchers are a special means of payment that allow households that are experiencing financial difficulties to cover part of their energy consumption expenses (electricity, gas, fuel oil, etc.) or their expenditure on improving the energy efficiency of their home.

In its capacity as an electricity supplier, EDF is required to maintain electricity supplies under the conditions laid down by said Article and by Decree no. 2008-780 of 13 August 2008 on the procedure applicable in the event of unpaid electricity, gas, heating and water bills, implemented in its amended form pursuant to Decree no. 2014-274 of 27 February 2014 and Decree no. 2016-555 of 6 May 2016.

Public Service Contract

On 24 October 2005, a Public Service Contract was entered into by the State and EDF pursuant to Article L. 121-46 of the French Energy Code. This contract, which details the commitments made by EDF and the State and specifies the rules governing the financial compensation for service commitments, will remain in force until a new contract is signed, as provided for in the contract itself.

Commitments by EDF (excluding network managers)

EDF's public service commitments include:

- the supply of electricity to customers who choose to remain at regulated tariffs;
- power generation: this area includes the implementation of the energy policy and maintaining a secure and environmentally friendly electricity production;
- the obligation to purchase or enter into remuneration supplement contracts concerning electricity generated by installations falling within the scope of the schemes
- contributing to the safety of the electricity network. In this regard, EDF undertakes to enter into several contracts with RTE, in particular concerning the optimisation of work on production facilities and the availability of the resources required to maintain network balance.

Commitments by network managers

Through the Public Service Contract, Enedis and RTE in their capacity as network managers made commitments concerning the management of the public networks for the transmission and distribution of electricity and the safety of the electricity system. These commitments are financed by the Tariff for Using the Public Electricity transmission and distribution Networks (TURPE).

These commitments concern, above all, network safety, supply quality, third party safety and the preservation of the environment – four areas where customers' and local authorities' expectations are especially high.

7.2 Incorporation documents and articles of association

In this Universal Registration Document, a reference to the articles of association means the Company's articles of association as approved by French Decree no. 2004-1224 of 17 November 2004 adopted under French Act no. 2004-803 of 9 August 2004 relating to the public electricity and gas service and electricity and gas companies (the "9 August 2004 law"), which have subsequently been amended on various occasions.

7.2.1 Corporate purpose

EDF's purpose, both in France and abroad and in compliance with the laws set out in the first Article of its articles of association, is:

- to ensure the production, transmission, distribution, supply and trading of electrical energy, and the import and export of said energy;
- to carry out the public service missions assigned to EDF by the laws and regulations, in particular by the French Energy Code, and Article L. 2224-31 of the French Local Authorities Code (Code général des collectivités territoriales), as well as by concession agreements, and in particular the mission to develop and operate public electricity grids and to supply energy at regulated rates, to supply back-up power to electricity producers and customers with the aim of compensating for unforeseen supply failures, and to supply electricity to eligible customers who cannot find a supplier, while contributing to the balanced development of electricity supply by reaching the goals defined by the multi-year generation investments programme defined by the Minister for Energy;
- more generally, to engage in any industrial, commercial or service activity, including research and engineering activities, in the field of energy, for all categories of customer;
- to enhance the value of all the personal and real property assets it holds or uses;
- to create, acquire, rent or lease under a business lease, all personal property, real property, businesses and clientele, to lease, install and operate all establishments, businesses and clientele, plants and workshops relating to any one of the aforementioned purposes;
- to obtain, acquire, operate or sell all processes and patents concerning the activities that are related to any of the aforementioned purposes;
- to take part, directly or indirectly, in all transactions that may be connected to any of the aforementioned purposes, by creating new companies or undertakings, by contributing, subscribing for or purchasing equity or ownership interests, stakes, or through mergers, partnerships or in any other way whatsoever;
- more generally, to engage in all industrial, commercial, financial transactions, whether in personal or real property, that are directly or indirectly connected, in whole or in part, to any similar or related purposes or even to any purposes that may favour or develop the Company's business.

EDF's *raison d'être* would be to "Build a CO_2-neutral energy future reconciling preservation of the planet, well-being and development through electricity and innovative solutions and services".

7.2.2 Fiscal year

Each fiscal year lasts for 12 months, starting on 1 January and ending on 31 December of each year.

7.2.3 Statutory distribution of profits

The distributable profit consists of the net profit for the fiscal year, less prior losses carried forward and the various deductions provided for by the law or the articles of association, plus any retained earnings carried forward.

The Shareholders' Meeting may decide to distribute amounts deducted from the reserves that are freely available to it, but must expressly state the reserve items from which the deductions are made.

After approving the financial statements and confirming the existence of distributable amounts (which include the distributable profit and any amounts deducted from the reserves mentioned above), the Shareholders' Meeting can decide to distribute all or part of such amounts to the shareholders in the form of a dividend, allocate them to reserve items or carry them forward. The Board of Directors may also distribute interim dividends prior to the approval of the financial statements for the fiscal year, under the conditions laid down by law.

The Shareholders' Meeting has the option of granting the shareholders a choice, for all or part of the dividend or interim dividend paid out, between payment in cash and payment in shares. Moreover, the Shareholders' Meeting may decide to pay any dividend, interim dividend, reserve or premium that is distributed or any reduction in capital, through remittal of the Company's assets, including financial securities.

Any shareholder who can prove, at the close of a fiscal year, that he has held registered shares for at least two years and still holds such shares on the date of payment of the dividend declared for the said fiscal year, will be entitled to an increased dividend for the said registered shares, equal to 10% of the dividend paid for the other shares, including in cases where the dividend is paid in shares. The number of shares eligible for the 10% increased dividend may not exceed 0.5% of the share capital at the close of the previous fiscal year, for any one shareholder. The first increased dividend was paid in 2014 for the 2013 fiscal year (see section 6.5.2 "Distribution policy, increased dividend").

The terms governing the payment of distributions decided by the Shareholders' Meeting, and the ex-dividend date of the distributed shares are fixed by the Shareholders' Meeting or, failing this, by the Board of Directors, in accordance with the applicable statutory provisions. If the amount of the non-cash distributions to which a shareholder is entitled does not correspond to a whole number of shares, the said number will be rounded down to the next whole number and a balancing cash payment made to the shareholder or, if requested by the Shareholders' Meeting, rounded up to the next whole number, with the difference being paid in cash by the relevant shareholder.

7.2.4 Rights attached to shares

Each share entitles its holder to a portion of the Company's profit and corporate assets that is proportional to the percentage of the capital that the share represents. Moreover, each share confers a voting right and the right to be represented at Shareholders' Meetings in accordance with legislative, regulatory and bylaw restrictions.

On the filing date of this Universal Registration Document, EDF has only issued a single class of shares.

Ownership of a share automatically entails acceptance of the articles of association and decisions adopted by Shareholders' Meetings.

Pursuant to Article L. 225-123 of the French Commercial Code, as amended by Act no. 2014-384 of 29 March 2014, all fully paid-up shares that have been registered for at least two years in the name of the same shareholder will automatically entitle their holder to voting rights that are double that of the other shares. These provisions took effect on 3 April 2016. EDF's Board of Directors had decided not to submit an amendment to the articles of association to the Shareholders' Meeting, preventing the application of the double voting right set out in Article L. 225-123 of the French Commercial Code.

Shareholders are only liable for losses within the limit of their contributions.

Whenever it is necessary to hold more than one share in order to exercise any right whatsoever, in the event of an exchange, reverse stock split or allocation of shares, or due to a capital increase or reduction, a merger or any other corporate transaction, owners of single shares or numbers of shares below that required may only exercise such right if they take personal responsibility for consolidating or, if necessary, purchasing or selling the requisite number of shares.

Shareholders can choose to hold shares in registered or bearer form, subject to compliance with the laws and regulations.

Shares may be registered with an intermediary under the conditions provided for in Articles L. 228-1 et seq. of the French Commercial Code. Intermediaries must declare their status as intermediaries who hold shares for a third party, under the conditions provided for by the laws and regulations. These provisions are also applicable to the other securities issued by the Company.

Under the conditions provided for by the laws and regulations in force, the Company is entitled to request from the central custodian of financial instruments, at any time and provided that it pays the required consideration, as applicable, the name or corporate name, the nationality, the year of birth or the year of incorporation, and the address of the holders of bearer shares that grant an immediate or deferred right to vote at its own Shareholders' Meetings, as well as the quantity of securities held by each of these shareholders and, where applicable, any restrictions to which the securities may be subject. The Company, in view of the list provided by the aforementioned body, has the right to ask the persons appearing on this list and whom the Company considers could be registered on behalf of third parties for the above information concerning the owners of the shares.

For registered shares that grant immediate or deferred access to the capital, intermediaries that are registered under the conditions provided for in Article L. 228-1 of the French Commercial Code mentioned above, are required, within ten business days as from the request made by the Company or its agent, which may be made at any time, to disclose the identity of the owners of said securities.

7.2.5 Assignment and transfer of shares

Shares can be traded without restriction, subject to compliance with the provisions of the laws and regulations. They are registered in an account and are passed on by transfer from one account to another.

7.2.6 Changes to the articles of association, the capital and voting rights

All changes to the articles of association, to the capital or to the voting rights attached to the securities that make up the capital are subject to the requirements of law, as the articles of association contain no specific provisions regarding such matters.

7.2.7 Members and functioning of the Board of Directors

The Board of Directors adopted internal rules of procedure, which are regularly updated, defining the operating procedures of the Board of Directors in addition to applicable legal and regulatory requirements and the provisions of the Company's articles of association.

These procedures are described in section 4.2. "Members and functioning of the Board of Directors".

The Group's internal rules of procedure are accessible on the Group's website (www.edf.fr).

7.2.8 Shareholder's Meetings

7.2.8.1 Convening notices to meetings

Shareholders' Meetings are convened by the Board of Directors or, in the last resort, by the Statutory Auditors or by any person empowered to do so. Meetings are held at the registered office or at any other place stated in the convening notice.

7.2.8.2 Participation in meetings and exercise of voting rights

Shareholders' Meetings may be held by video conference or any telecommunication means that allow shareholders to be identified. The conditions governing the type and use of such means are specified in Articles R. 225-97 to R. 225-99 of the French Commercial Code. In such cases, shareholders who participate in the meeting by such means are deemed to be present for the calculation of the quorum and majority, under the conditions specified by law.

All shareholders can attend Shareholders' Meetings, regardless of the number of shares they own.

Shareholders may choose between one of the following three methods of participation: attending the General Meeting in person by requesting an admission card, giving a proxy (power of attorney) to the Chairman of the General Meeting or to any individual or legal entity of their choice (Article L. 225-106 of the French Commercial Code) or casting their vote remotely (forms which fail to provide a choice as regards a voice are considered as negative votes; votes expressing an abstention will be taken into account for the calculation of the quorum but will not be taken into account for the calculation of the majority).

In accordance with Article R. 225-85 of the French Commercial Code, proof of the right to participate in a Shareholders' Meeting is obtained by the registration of the securities in an account in the name of the shareholder or of the intermediary that is registered on the shareholder's behalf (pursuant to paragraph 7 of Article L. 228-1 of the French Commercial Code), on the second day prior to the meeting, *i.e.* at midnight, Paris time, either in the registered share accounts held by the Company (or its authorised representative), or in the bearer share accounts held by the accredited intermediary.

In accordance with Article R. 225-85 of the French Commercial Code, the registration of the securities in the bearer share accounts held by financial intermediaries is evidenced by a shareholding certificate issued by these intermediaries, where applicable by electronic means under the conditions provided for in Article R. 225-61 of the French Commercial Code, as an appendix to the postal voting form, the voting proxy or admission card request made on behalf of a shareholder or on behalf of a shareholder who is represented by the registered intermediary.

All shareholders may grant a proxy to any individual or legal entity of their choice in order to be represented at a Shareholders' Meeting. Proxies, as well as any proxy revocations, must be evidenced in writing and notified to the Company. Proxies may be revoked in the same forms as those required for the designation of the proxy holder, including by electronic means if need be. The owners of shares that are properly registered in the name of an intermediary under the conditions provided for in Article L. 228-1 of the French Commercial Code may be represented by a registered intermediary under the conditions provided for in said article.

EDF gives its shareholders the possibility of voting online, prior to the Shareholders' Meeting.

Certain shares may carry double voting rights in accordance with the conditions laid down in Act no. 2014-384 of 29 March 2014 (see section 7.2.4 "Rights attached to shares").

7.2.8.3 Requests for the inclusion of items or draft resolutions on the agenda and written questions to the Board of Directors

Requests for the inclusion of items or draft resolutions on the Shareholders' Meeting agenda made by shareholders who meet the conditions provided for in Article R. 225-71 of the French Commercial Code must be received by the Company no later than twenty-five day prior to the date of the Shareholders' Meeting, but may not be sent more than 20 calendar days after the publication of the prior meeting notice, in accordance with Article R. 225-73 of the French Commercial Code.

Requests for the inclusion of items on the agenda must be substantiated. The wording of the draft resolutions must accompany requests for the inclusion of such resolutions, and a brief explanation of the reasons may also be given.

On the date of the request, the authors must provide proof of owning or representing the percentage of the capital required by Article R. 225-71 of the French Commercial Code. Requests must be accompanied by proof of entry in an account. Agenda items or draft resolutions that are proposed for inclusion are only reviewed if the authors of the request submit a new certificate proving the registration of the securities in the same accounts on the second day prior to the meeting.

Each shareholder also has the option of sending the Board of Directors written questions of his or her choice. The Board of Directors will answer, or delegates the Chairman and Chief Executive Officer the power to answer, the questions during the meeting, or, in accordance with Article L. 225-108 of the French Commercial Code, the answer is deemed to have been given provided that it is published on the Company's website.

Written questions must be sent to the Company by registered letter with return receipt or by electronic telecommunication at the latest on the fourth business day prior to the date of the Shareholders' Meeting. In accordance with Article R. 225-84 of the French Commercial Code, these questions must be accompanied by a shareholding certificate, in order to be taken into account.

7.2.8.4 Temporary disposals during meeting periods

In accordance with the provisions of Article L. 225-126 of the French Commercial Code, any person, alone or together with other persons, by way of one or more temporary disposals or any transaction that grants the right to or requires the resale or return of said shares to the assignor, who holds a number of shares that represents more than 0.5% of the voting rights in a listed company, must notify the Company and the French Market Authority no later than midnight, Paris time, on the second business day prior to the Shareholders' Meeting, and when the contract that arranges this transaction remains in force on this date, of the total number of shares held on a temporary basis. In addition to the number of shares acquired, this notification must contain the identity of the assignor, the date and the expiration of the contract that organises the transaction and, as applicable, the voting agreement.

If no information is provided to the Company and the French Market Authority, the shares thus acquired are automatically stripped of voting rights for the Shareholders' Meeting concerned and for all Shareholder's Meetings that are held until such shares are resold or returned.

Moreover, the Company representative, a shareholder or the French Market Authority may petition the Commercial Court to order the complete or partial suspension, for a maximum of five years, of the voting rights of any shareholder who fails to provide such information, regardless of whether or not the voting borrowing shareholder has exercised his or her voting rights.

7.2.9 By law or statutory provisions that delay acquisition of control over the Company

Pursuant to Article L. 111-67 of the French Energy Code and the EDF articles of association, changes in share capital cannot result in the French State's shareholding falling below the statutory 70% threshold.

Certain shares may carry double voting rights in accordance with the conditions laid down in Act no. 2014-384 of 29 March 2014 (see section 7.2.4 "Rights attached to shares").

With the exception of the foregoing, no other provision specifically aims to prevent or delay the takeover of the Company by a third party.

7.2.10 Threshold crossings

Pursuant to the provisions of the French Commercial Code, any individual or legal entity, acting alone or together with other persons or entities, that acquires a number of shares that represents more than 5%, 10%, 15%, 20%, 25%, 30%, 33.3%, 50%, 66.6%, 90% or 95% of the capital or voting rights must inform the Company, no later than prior to the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded, of the total number of shares or voting rights owned (Article R. 233-1 of the French Commercial Code). Moreover, such individuals or legal entities must also inform the AMF of these acquisitions no later than prior to the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded (Article 223–14 of the AMF general regulation). The AMF publishes threshold crossings that are notified to it.

Since 2012, cash payoff or physically-settled derivatives having a similar economic effect to detention of underlying shares, are taken into account for this calculation of threshold crossing (Article L. 233-9(I) 4o bis of the French Commercial Code). Pursuant to AMF general regulations, holders of these financial instruments must take into account the number of shares that carry this type of agreement and financial instruments for the calculation of their participation in the framework of their reporting obligation, and must precise, when they declare threshold crossing, their intention as to the outcome of this type of agreements and financial instruments.

Within the same timeframes and under the same conditions, this information must also be disclosed when the capital or voting rights fall below the thresholds stated above.

Absent a proper declaration, the shares that exceed the fraction which should have been declared in accordance with the provisions of law mentioned above will be stripped of voting rights for all Shareholders' Meetings that are held during a two-year period following the date on which the effective disclosure is made.

Moreover, the Company's articles of association provide that any individual or legal entity, acting alone or jointly, who acquires or ceases to hold, directly or indirectly, a number of shares that corresponds to 0.5% of the Company's capital or voting rights, or a multiple of said fraction, is required to inform the Company, by registered letter with return receipt requested, at the latest before the close of business on the fourth trading day following the day on which the shareholding threshold is exceeded, of the total number of shares, voting rights or equity interests held. The Company's articles of association state that the rules for the calculation and assimilation of shareholdings applicable to the statutory thresholds, as well as the obligations to provide information on financial instruments that are not assimilated to shares, apply to the disclosure requirements set out in the articles of association for bylaw thresholds.

Failure to comply with the above provisions is punishable by the loss of voting rights for the shares that exceed the fraction that should have been declared, for all Shareholders' Meetings that are held until the expiration of a two-year period following the date of the effective threshold disclosure provided for above, if the application of this penalty is requested by one or more shareholders who hold at least 1% of the Company's capital. Such requests are recorded in the minutes of Shareholders' Meetings.

7.3 Information regarding capital and share ownership

7.3.1 Amount and changes in share capital

On the filing date of this Universal Registration Document, the details of the Company's share capital are as follows:

Number of shares issued	**3,099,923,579**
Par value	€0.50 per share
Type of shares issued	common shares
Share capital amount	€1,549,961,789.50

The share capital issued by the Company has been paid up in full. The Company has not issued or authorised any preference shares.

Pursuant to the law of 9 August 2004, EDF was converted into a *société anonyme* (public limited company) on 20 November 2004 and its capital set at €8,129,000,000, divided into 1,625,800,000 shares with a par value of €5.

The EDF Shareholders' Meeting of 31 August 2005 granted full powers to the EDF Board of Directors with a view to reducing the capital by a maximum amount of €7,316,100,000, *via* a reduction in the par value of shares from €5 to a minimum of €0.5. During its meeting of 27 October 2005, the Board of Directors decided to reduce the share capital by €7,316,100,000, *via* a €4.50 reduction in the par value of shares, which therefore decreased from €5 to €0.50. The share capital was thus reduced to €812,900,000.

During its 18 November 2005 meeting, the Board of Directors used the authority granted to it by the Combined Shareholders' Meeting of 10 October 2005 and approved the increases in the Company's share capital in connection with the Open Price Offering and the Guaranteed Global Placement that were performed when the Group was first listed on the stock market. As a result, the Board of Directors increased the share capital to €906,834,514.

On 20 December 2005, Calyon (now Crédit Agricole-CIB) paid EDF the price that corresponded to the exercise of 8,502,062 warrants that the EDF Board issued to Calyon by decision taken on 18 November 2005. Consequently, the share capital was increased to €911,085,545 divided into 1,822,171,090 common shares.

The payment of dividends in shares on 17 December 2009 resulted in an increase in the share capital of €13,347,786 following the issue of 26,695,572 shares. On 21 January 2010, the share capital was thus increased to €924,433,331 divided into 1,848,866,662 common shares.

On 24 June 2011, the capital was increased to €930,406,055 divided into 1,860,812,110 common shares, *via* the issue of new shares as consideration for the EDF Énergies Nouvelles shares contributed to EDF in exchange for the EDF shares tendered as part of the alternative simplified public purchase or exchange offer involving EDF Énergies Nouvelles shares, which was initiated by EDF (see section 1.4.1.5.3 "EDF Renewables"). Then, on 28 September 2011, the capital was reduced to €924,433,331 divided into 1,848,866,662 common shares, *via* the cancellation of the shares purchased as part of the share buyback programme with a view to cancellation, in order to offset the dilution caused by the aforementioned offer.

On 29 July 2013, the capital was increased to €930,004,234, divided into 1,860,008,468 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 30 May 2013 to offer each shareholder in the Company the possibility to opt for the payment in new shares of a fraction of the remaining dividend to be distributed for the fiscal year ending 31 December 2012.

The payment of interim dividends in shares on 18 December 2015 resulted in an increase in the capital of €30,065,279.50 following the issue of 60,130,559 shares. The share capital was thus increased from €930,004,234 to €960,069,513.50 divided into 1,920,139,027 common shares.

On 31 October 2016, the capital was increased to €1,054,568,341.50 divided into 2,109,136,683 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 12 May 2016 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2016.

The payment of interim dividends in shares on 31 October 2016 resulted in an increase in the capital of €47,942,646 following the issue of 95,885,292 shares. The capital was thus increased from €1,006,625,695.50 to €1,054,568,341.50, divided into 2,109,136,683 common shares.

At its meeting of 3 March 2017, the Board of Directors, making use of the delegation of authority given by the Combined Shareholders' Meeting of 26 July 2016 in its second resolution, decided to increase the capital with maintenance of the shareholders' preferential subscription right. The capital was increased to €1,370,938,843.50, divided into 2,741,877,687 common shares. The final gross capital increase, including the issue premium, stood at €4,017,905,375.40 and resulted in the issue of 632,741,004 new shares. It was launched on 6 March 2017 and was completed on 30 March 2017.

On 12 July 2017, the capital was increased to €1,443,677,137, divided into 2,887,354,274 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 18 May 2017 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2016.

The payment of interim dividends in shares on 14 December 2017 resulted in an increase in the capital of €398,440,228.20 following the issue of 40,084,530 shares. The capital was thus increased from €1,443,677,137 to €1,463,719,402, divided into 2,927,438,804 common shares.

On 29 June 2018, the capital was increased to €1,505,133,838, divided into 3,010,267,676 common shares. This increase of capital followed the decision of the EDF Shareholders' Meeting of 15 May 2018 to offer each shareholder in the Company the possibility to opt for the payment in new shares of the remaining dividend to be distributed for the fiscal year ending 31 December 2017.

At the Board meeting held on 19 November 2019, the directors decided to distribute an interim dividend of €0.15 per share for the 2019 fiscal year and resolved, in accordance with the terms of the fourth resolution adopted at the Combined Shareholders' Meeting held on 16 May 2019, that it could be paid in new shares issued by the Company.

The payment of interim dividends in shares on 17 December 2019 resulted in an increase in the share capital of €429,635,913.60 following the issue of 52,651,460 shares. The capital was thus increased from €1,525,484,813.00 to €1,551,810,543, divided into 3,103,621,086 common shares.

At its meeting on 29 July 2020, the Board of Directors decided to cancel 3,697,507 EDF treasury shares on 30 September 2020 that had previously been allocated to a capital reduction target through the cancellation of shares on 19 December 2019. On that date, the share capital was reduced to €1,549,961,789.50 in par value, divided into 3,099,923,579 shares with a par value of €0.50 each.

7.3.2 Treasury shares and share buyback programme

A share buyback programme initially authorised by the Shareholders' Meeting held on 9 June 2006, has been used by the Board of Directors within a limit of 10% of the Company's share capital and for an initial period of 15 months. This programme was continued for 18 months by the following Shareholders' Meetings held since 2006, including by the Shareholders' Meeting held on 15 May 2018 which approved it.

7.3.2.1 Share buyback programme in force as of the filing date of the Universal Registration Document (programme authorised by the Shareholders' Meeting of 7 May 2020)

After consulting the Board of Directors' report, and in accordance with the provisions of Articles 22-10-62 et seq. of the French Commercial Code, Articles L. 241-1 et seq. of the general regulation of the AMF, EU regulation n°596/2014 of 16 April 2014 on market abuse, the twenty-first resolution adopted by the Shareholders' Meeting held on 7 May 2020 authorised the Board of Directors to implement a programme to buy back Company shares, capped at a maximum of 10% of the Company's capital.

This resolution immediately terminated the unused portion of the authorisation to purchase Company shares, which was granted by the eighteenth resolution adopted by the Shareholders' Meeting held on 16 May 2019.

The main aims of the share buyback programme are as follows: to cancel shares; to allot or transfer shares to employees or former employees of the Company, on the terms and conditions provided for by law, in particular as their share of the Company's profits, or by way of bonus shares or offers reserved for employees; to deliver shares following the exercise of rights attached to securities granting access to the capital by redemption, conversion, exchange, presentation of a warrant or otherwise; to provide liquidity through a liquidity contract in accordance with accepted market practice established by the AMF; to deliver shares following the exercise of rights attached to securities granting access to the Company's capital and implement all hedging transactions for the obligations of the Company or one of its subsidiaries; to retain and subsequently deliver shares in connection with external growth transactions, contributions, mergers or demergers; more generally, to carry out any transaction that is or may become authorised under the regulations in force, or falling within the scope of market practice accepted by the AMF.

The maximum percentage of capital that may be bought back under this programme is 10% of the total number of shares making up the share capital (or 5% for shares acquired with a view to their retention and subsequent delivery in payment or in exchange as part of an external growth transaction), it being noted that whenever shares are bought back to provide liquidity under a liquidity contract, the 10% threshold will be calculated using the number of shares purchased, as reduced by the number of shares resold during the validity period of the authorisation.

Under no circumstances may the Company hold, directly or indirectly, more than 10% of its capital.

These shares may be acquired or transferred, under the conditions and within the limits, in particular in terms of volumes and price, provided for by the laws and regulations in force on the date of the relevant transactions, by any means, such as on the market or over the counter, including *via* block trades (purchases or sales), by the use of derivative financial instruments or notes or securities that grant access to Company shares, or by implementing option strategies, under the conditions stipulated by the market authorities and at such times as determined by the Board of Directors or any person who is acting on the Board's behalf. This authorisation may be used during public takeover bids, within the limits permitted by the applicable regulations.

The Shareholders' Meeting set at €20 the maximum purchase price per share [(1)] and at €2 billion the maximum amount of funds allocated to the implementation of the programme, and granted the Board of Directors full powers, with the right of delegation, to use this authorisation.

The authorisation was granted for a maximum of 18 months as from the Shareholders' Meeting of 7 May 2020, and will therefore end on 7 November 2021, unless the Shareholders' Meeting of 6 May 2021 adopts the new programme described in section 7.3.2.3 "Description of the new share buyback programme to be submitted for approval at the Combined Shareholders' Meeting to be held on 6 May 2021" below.

7.3.2.2 Summary of the Company's trading in its own shares during the 2020 fiscal year

Number of treasury shares held at 31 December 2020	**830,000**
Percentage of capital held through treasury shares at 31 December 2020	0.027%
Carrying value of the portfolio at 31 December 2020 [(1)] *(in euros)*	10,336,151.68
Market value of the portfolio at 31 December 2020 [(2)] *(in euros)*	10,702,850
Number of shares cancelled over the past 24 months	3,697,507

(1) Valued at the purchase price.
(2) Based on the closing price at 31 December 2020, i.e. €12.895.

(1) The Board of Directors may, however, adjust the aforementioned purchase price if premiums, reserves or profits are capitalised, which results either in an increase in the par value of the shares or the creation and award of bonus shares, and in the event of a stock split or reverse stock split, or any other transaction involving the shareholders' equity, in order to take into account the impact of these operations on share value.

Liquidity contract

Following changes to the regulations governing liquidity contracts and in accordance with AMF decision no. 2018-01 of 2 July 2018, a new liquidity contract was signed with Oddo BHF and as at 28 March 2019, the liquidity account comprised €10,120,161 and 738,882 shares.

Number of shares purchased and sold during the 2020 fiscal year

During the 2020 fiscal year, EDF acquired 8,226,451 of its own shares and sold 8,581,882 shares under the liquidity contract. The average share purchase price was €9.5748 and the average share sale price was €9.8023.

Portfolio breakdown at 31 December 2020

As at 31 December 2020, the Company held a total of 830,000 treasury shares, all held under the liquidity contract (representing 0.027% of its share capital).

On 19 December 2019, the Chairman and Chief Executive Officer, using the powers delegated by the Board of Directors, decided to reallocate 3,646,913 EDF shares initially allocated to the liquidity contract and 50,594 shares allocated to a 2007 offer reserved for employees that had lapsed, *i.e.* a total of 3,697,507 shares, with the aim of reducing the capital by cancelling the said shares. On 30 September 2020, following a decision by the Board of Directors on 29 July 2020, the 3,697,507 shares allocated to the capital reduction target were cancelled.

On this date, EDF's subsidiaries did not hold any shares, either directly or indirectly.

Post-closing transactions

Between 1 January 2021 and 28 February 2021, the Company acquired 1,501,540 treasury shares for an average unit value of €11.29178, and sold 928,715 shares for an average unit value of €11.51792.

7.3.2.3 Description of the new share buyback programme to be submitted for approval at the Combined Shareholders' Meeting to be held on 6 May 2021

Pursuant to Article 241-2 et seq. of the AMF general regulations and Article L. 451-3 of the French Monetary and Financial Code, and in accordance with EU regulations, the following is a description of the share buyback programme that will be submitted to the Ordinary and Extraordinary Shareholders' Meeting to be held on 6 May 2021 for approval.

Objectives of the new share buyback programme

Under the share buyback programme, shares will be bought back for the following purposes:

- to reduce the capital by cancelling them;
- to allow them to be allotted to employees and former employees of the EDF group, on the terms and conditions provided for by law, in particular as part of any stock options plan, allocation of bonus shares, or any offers reserved for employees;
- to allow them to be delivered when exercising rights attached to securities granting access to the capital by redemption, conversion, exchange, presentation of a warrant or otherwise and to implement all hedging transactions for the obligations of the Company or one of its subsidiaries related to those securities;
- to provide liquidity under a liquidity contract;
- to allow them to be delivered following the exercise of rights attached to options granting access to the Company's capital and to implement all hedging transactions for the obligations of the Company or one of its subsidiaries related to these securities;
- to allow them to be retained and subsequently delivered in connection with external growth transactions, contributions, mergers or demergers;
- more generally, to carry out any transaction that is or may become authorised under the regulations in force, or falling within the scope of market practice accepted by the AMF.

Duration of the share buyback programme

The share buyback programme may be implemented for a period of 18 months, as of the Shareholders' Meeting of 6 May 2021.

Maximum percentage of capital, maximum number and characteristics of the shares that the Company wishes to buy back and maximum purchase price

The maximum percentage of capital that may be bought back under this programme is 10% of the total number of shares making up the share capital (or 5% for shares acquired with a view to their retention and subsequent delivery in payment or in exchange as part of an external growth transaction), it being noted that whenever shares are bought back to provide liquidity under a liquidity contract, the 10% threshold will be calculated using the number of shares purchased, as reduced by the number of shares resold during the validity period of the authorisation.

Under no circumstances may the Company hold, directly or indirectly, more than 10% of its capital.

The maximum purchase price of shares under this resolution is €20 per share and the total amount of funds that may be allocated to the implementation of this share buyback programme may not exceed €2 billion.

7.3.3 Capital authorised but not issued

The following table presents a summary of the delegations of authority and authorisations to increase or reduce the share capital that were in force on the filing date of this Universal Registration Document which the Board of Directors was granted by the Combined Shareholders' Meeting of 6 May 2020, and the extent to which they have been used at 31 December 2020:

STATUS OF THE AUTHORISATIONS ADOPTED BY THE COMBINED GENERAL MEETING OF 7 MAY 2020

Securities concerned/type of issue	Term of the authorisation and expiration	Maximum nominal increase or reduction in capital *(in millions of euros)*	Use of authorisations *(in millions of euros)*
Delegation of authority to the Board to increase the capital with maintenance of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	365 [1]	none
Delegation of authority to the Board to increase the capital, by way of a public offering, with cancellation of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	290 [1]	none
Delegation of authority to the Board to make offers for private placements [2] with cancellation of the shareholders' preferential subscription right Capital increase, all securities	26 months 7 July 2022	290 [1] and 20% of the share capital per year	Issue of 219,579,139 OCEANE bonds
Authorisation for the Board to increase the number of securities to be issued in the event of a capital increase, with or without preferential subscription rights Capital increase, all securities	26 months 7 July 2022	15% of the amount of the initial issue [1]	none
Delegation of authority to the Board to increase the capital through the capitalisation of reserves, profits, premiums or otherwise	26 months 7 July 2022	1,000	none
Delegation of authority to the Board to increase the capital as consideration for a public exchange bid initiated by the Company	26 months 7 July 2022	145 [1]	none
Delegation of authority to the Board to increase the capital to remunerate in-kind contributions [3]	26 months 7 July 2022	10% of the Company's capital up to a maximum of 95 [1]	none
Delegation of authority to the Board of Directors to increase the share capital in favour of members of savings plans with cancellation of preferential subscription rights in favour of the latter Issues reserved for the personnel	26 months 7 July 2022	15	none
Delegation of authority to the Board to carry out increases of capital reserved for categories of beneficiaries, with cancellation of the shareholders' preferential subscription right	18 months 7 November 2021	10	none
Authorisation for the Board to reduce the capital by cancelling treasury shares	18 months 7 November 2021	10% of the capital by 24-month periods	Cancellation of 3,697,507 shares

(1) The nominal aggregate limit on the share capital increase of €365 million provided for in the twenty-second resolution submitted to the General Meeting of 7 May 2020, applies to all capital increases, with the exception of capital increases through capitalisation of reserves, premiums, profits or otherwise and capital increases that are reserved for savings plan members.

(2) Offers governed by Article L. 411-2 II of the French Monetary and Financial Code, in that they are exclusively intended for persons who provide investment portfolio management services on behalf of third parties or qualified investors or a restricted circle of investors acting on their own behalf.

(3) Article L. 225-147 of the French Commercial Code.

STATUS OF THE AUTHORISATIONS TO BE SUBMITTED TO THE COMBINED SHAREHOLDERS' MEETING OF 6 MAY 2021 FOR APPROVAL

Securities concerned/type of issue	Term of the authorisation and expiration	Maximum nominal increase or reduction in capital *(in millions of euros)*
Delegation of authority to the Board to carry out increases of capital reserved for a category of beneficiaries, with cancellation of the shareholders' preferential subscription right	18 months 7 November 2022	10
Authorisation for the Board to reduce the capital by cancelling treasury shares	18 months 7 November 2022	10% of the capital by 24-month periods

7.3.4 Other equity securities

On 8 September 2020, EDF launched an issue of senior unsecured Green Bonds convertible into and/or exchangeable for new and/or existing shares (Green OCEANE Bonds) maturing on 14 September 2024. The bonds were offered to the public exclusively to qualified investors, within the meaning of Article 2(e) of EU regulation 2017/1129 of 14 June 2017, in France and outside France, in accordance with the procedure known as "bookbuilding", as developed by professional practice, with the exception of the United States of America, Australia and Japan (as referred to in Article L. 411-2, 1° of the French Monetary and Financial Code) for a maximum par value of approximately €2.4 billion and a gross annual negative return of -1.68%.

On the 14th of September 219, 579,139 Green OCEANE Bonds were issued under ISIN code FR0013534518 with a par value of €10.93 and an issue price of €11.70, *i.e.* 107% of the par value. They do not bear interest. The French State has subscribed to 87,831,655 Green OCEANES bonds, *i.e.* 40% of the bond issue and €960 million of principal.

The Company has decided that in the event that the holders of Green Bonds exercise the option to convert and/or exchange the Green Bonds into ordinary shares of the Company, the Green Bonds will be converted and the Company will issue new ordinary shares. The conversion ratio is 1 OCEANE bond for 1 common share but may be subject to adjustment in accordance with the terms of the issue agreement.

An amount equal to the net proceeds of the issue will be allocated, directly or indirectly, to the financing and/or refinancing, in whole or in part, of new or existing Eligible Projects, as defined in EDF's Green Bond Frameword. Existing eligible projects that may be refinanced through this Issue with a maximum three-year retrospective period preceding the year of the Bond Issue represent approximately €1.5 billion, pursuant to EDF's Green Bond Framework.

This issue may also contribute to the strengthening of the Company's shareholders' equity, in the event that the holders exercise their option to convert the Green OCEANE Bonds, resulting in the issue of new shares of the Company.

Assuming an issue with a par value of €2,399,999,989.27 represented by 219,579,139 bonds with a par value of €10.93 each, based on the initial conversion ratio, the potential dilution would be approximately 7.1% of the Company's share capital if the right to the allocation of shares were exercised for all Bonds and the Company decided to issue only new shares in the event that the right to the allocation of shares is exercised. (see section 6.8 presenting the report of the Board of Directors and the Statutory Auditors on the bond issue).

7.3.5 Non-equity securities

On 18 April 1996, EDF set up a programme to issue debt securities in the form of Euro Medium Term Notes (the "EMTN" programme). Since this date, this programme has been regularly renewed.

On 6 October 2016, EDF successfully raised $2.655 billion from 2 senior bonds subscribed for by twenty or so investors on the Taiwanese market ("Formosa bonds"):

- $491 million, with a fixed coupon of 4.65%, 30-year bond;
- $2.164 billion, with a fixed coupon of 4.99%, 40-year bond.

On 6 October 2016, EDF also successfully launched a senior multi-currency bond issue of approximately €3 billion in four tranches:

- €1.75 billion, with a fixed coupon of 1%, 10-year Green Bond;
- €750 million, with a fixed coupon of 1.875%, 20-year bond;
- CHF400 million, with a fixed coupon of 0.3%, 8-year bond;
- CHF150 million, with a fixed coupon of 0.65%, 12-year bond.

This third Green Bond issue, in an amount of €1.75 billion, is the largest tranche of Green Bonds issued to date and means that EDF has already issued the equivalent of more than €4 billion in Green Bonds over a three-year period to support its expansion in the renewable energies field.

On 20 January 2017, EDF successfully raised 137 billion yen, corresponding to approximately €1.1 billion, through 4 senior bonds issued on the Japanese market ("Samurai bonds"):

- JPY107.9 billion, with a fixed coupon of 1.088%, 10-year bond;
- JPY19.6 billion, with a fixed coupon of 1.278%, 12-year Green Bond;
- JPY6.4 billion, with a fixed coupon of 1.569%, 15-year Green Bond;
- JPY3.1 billion, with a fixed coupon of 1.870%, 20-year bond, which is the longest bond maturity ever issued on the Samurai market.

With the issue of two green tranches, in a total amount of 26 billion yen to be used to finance its renewable investments, EDF opens the Samurai Green market and thus continues to actively participate in the development of Green Bonds as tools to finance the energy transition.

On 19 September 2018, EDF successfully raised US$3.75 billion on 3 tranches of senior bonds:

- $1.8 billion, with a fixed coupon of 4.500%, 10-year bond;
- $650 million, with a fixed coupon of 4.875%, 20-year bond;
- $1.3 billion, with a fixed coupon of 5.000%, 30-year bond.

In addition, on 25 September 2018, EDF successfully launched a €1 billion senior bond issue with a 12-year maturity and a fixed coupon of 2%.

On 25 September 2018, EDF launched a €1.25 billion super-subordinated bond issue with a 4% coupon and a redemption option exercisable at EDF's discretion, initially between 4 July 2024 (inclusive) and 4 October 2024 (inclusive). It also launched a contractual cash buyback offer for four existing hybrid bond issues for €1.25 billion. The total amount of EDF hybrid shares remains unchanged following these issue/redemption operations.

On 26 November 2019, EDF launched a €500 million euro-denominated hybrid bond issue with a 3% coupon and a redemption option including a first option for early redemption at the Company's call in December 2027. The Company also launched contractual buyback offers for the following securities:

- perpetual super-subordinated bonds of €1,000 million with a first early redemption date at the Company's call falling on 22 January 2022, with a current outstanding amount of €661.8 million, admitted for trading on Euronext Paris;
- perpetual super-subordinated bonds of US$3,000 million with a first early redemption date at the Company's call falling on 29 January 2023, with a current outstanding amount of US$3,000 million admitted for trading on the regulated market of the Luxembourg Stock Exchange.

On 28 November 2019, EDF raised US$2 billion with a 50-year maturity and a fixed coupon of 4.5% under its EMTN program.

As part of the same programme, on 2 December 2019, EDF raised €1.25 billion with a 30-year maturity and a fixed coupon of 2%. On 12 December 2019, EDF announced the final result of its buyback offer for euro-denominated hybrid bonds and the results of early participation in its buyback offer for US dollar-denominated hybrid bonds.

On 30 December 2019, EDF announced the final result of its buyback offer for US dollar-denominated hybrid bonds. The Company also exercised its option to buy back on 29 January 2020 all of the perpetual subordinated bonds totalling €1.250 billion, with a current outstanding amount of €338.2 million.

On 8 September 2020, EDF launched two new euro-denominated hybrid bond issues for a total par value of €2.1 billion, consisting of:

- an issue of hybrid perpetual bonds for an amount of €850 million with an initial coupon of 2.875% and a first option for early redemption at the Company's option on 15 December 2026 (the "Hybrid Bonds not redeemable before 6.5 years");
- 1.250 billion euro open-ended hybrid bond issue with an initial coupon of 3.375% and a first option for early redemption at the Company's option on 15 June 2030 (the "Hybrid Bonds not redeemable before 10 years", together with the Hybrid Bonds not redeemable before 6.5 years, the "Hybrid Bonds").

7.3.6 Information on the capital of every group member that is the subject of a conditional or unconditional agreement

Acquisition and disposal commitments involving securities in subsidiaries are described in note 3.2 to the consolidated financial statements for the fiscal year ended 31 December 2020.

With the exception of these commitments to acquire and dispose of securities and any other commitments that are described in chapter 1 ("The Group, its strategy and activities") of this Universal Registration Document, EDF has not made any promises to purchase or sell that would make it possible to acquire or dispose of, as applicable, all or part of the capital of the Company or of any of its subsidiaries, as defined in Article L. 233-1 of the French Commercial Code.

7.3.7 Pledge of the Company's shares

To the Company's knowledge, none of the Company's common shares that make up its share capital have been pledged.

7.3.8 Ownership of the Company's capital and voting rights

For the past three fiscal years, EDF's share capital has been owned as follows as at 31 December of each year:

	At 31/12/2020		At 31/12/2019		At 31/12/2018	
	Number of shares	% of capital	Number of shares	% of capital	Number of shares	% of capital
State [1]	2,593,960,583	83.68	2,593,960,583	83.58	2,518,498,450	83.67
Institutional and private investors	463,040,491	14.94	463,147,431	14.92	453,361,661	15.06
Employee shareholdings	42,092,505 [(i)]	1.36	41,630,134 [(ii)]	1.34	34,679,546 [(iii)]	1.15
Treasury shares	830,000	0.02	4,882,938	0.16	3,728,019	0.12
TOTAL	**3,099,923,579**	**100**	**3,103,621,086**	**100.00**	**3,010,267,676**	**100.00**

(i) This number includes 38,075,245 shares (representing 1.23% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" FCPE of the EDF group's savings plan). This number also includes almost 4.017 million shares, representing 0.13% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

(ii) This number includes 37,527,237 shares (representing 1.21% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" FCPE of the EDF group's savings plan). This number also includes almost 4.1 million shares, representing 0.13% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

(iii) This number includes 30,453,101 shares (representing 1.01% of the capital) based on the definition of employee shareholdings under Article L. 225-102 of the French Commercial Code (shares held by EDF's employees and former employees through the "Actions EDF" FCPE of the EDF group's savings plan). This number also includes almost 4.2 million shares, representing 0.14% of the capital, held as directly or administered registered shares, with no lock-in periods or whose lock-in periods have expired, by employees or former employees.

(1) The French State's shareholding in EDF includes the allocation of 328,349,361 EDF shares to the EPIC BPI France.

Following a French state allotment of 389,349,361 EDF shares to EPIC Bpifrance, on 29 January 2018, BPI France and the French State combined crossed the statutory thresholds of 5%, 10%, 15%, 20%, 30%, one third, 50% and two-thirds of the Company's capital and voting rights. The French state and Bpifrance act together and have to consult each other before every Shareholders' Meeting of EDF. Bpifrance undertook to not transfer, pledge or otherwise dispose of the EDF shares.

To the Company's knowledge, no shareholder other than the French State and Bpifrance directly or indirectly holds more than 5% of the capital and voting rights.

In October 2020, the French State reduced its allocation to EPIC Bpifrance by 61,000,000 EDF shares.

The Company conducted a study on identifiable bearer of shares as at 31 December 2020, which allowed it to examine the ownership of its capital and the geographical location of its shareholders on this date. The table set out below summarises this information as at 31 December 2020 and 31 December 2019:

	At 31/12/2020		At 31/12/2019	
	Number of shares held	% of capital	Number of shares held	% of capital
State *	2,593,960,583	83.68	2,593,960,583	83.58
Institutional investors in Europe (other than France)	143,898,238	4.64	128,064,805	4.13
Institutional investors in the rest of the world	176,371,418	5.69	196,362,093	6.33
Institutional investors in France	81,640,550	2.64	74,924,143	2.41
Private shareholders	61,130,285	1.97	63,796,390	2.05
Employee shareholdings	42,092,505	1.36	41,630,134	1.34
Treasury shares	830,000	0.02	4,882,938	0.16
TOTAL	**3,099,923,579**	**100.00**	**3,103,621,086**	**100.00**

* *The French State's stake in EDF's share capital includes the allocation of 328,349,361 EDF shares corresponding to the allocation of 389,349,361 EDF shares minus the 61,000,000 EDF shares returned in October 2020.*

The French State [(1)] indicated that it held 2,593,960,583 shares and 4,723,109,672 voting rights in EDF as of 31 December 2020 (*i.e.* 83.68% of EDF's share capital and 89.05% of its voting rights) [(2)].

The French State committed to opt for a payment in shares for the balance of the 2018 dividend and for dividends relating to 2019 and 2020 fiscal year. It has renewed its commitment for fiscal year 2021.

31/12/2020	Equities	% of capital	Theoretical voting rights	% of theoretical voting rights	Voting rights exercisable at General Meetings	% of voting rights exercisable at General Meetings
State Including Epic BPIFrance	2,593,960,583	83.68	4,723,109,672	89.05	4,723,109,672	89.07
Employee shareholdings	42,092,505	1.36	74,964,231	1.41	74,964,231	1.41
Individual and institutional shareholders	463,040,491	14.94	504,900,795	9.52	504,900,795	9.52
Treasury shares	830,000	0.02	830,000	0.02	-	-
TOTAL	**3,099,923,579**	**100**	**5,303,804,698**	**100**	**5,302,974,698**	**100**

7.3.9 Agreements whose implementation could lead to a change of control

To EDF's knowledge, there are no agreements whose implementation could subsequently lead to a change in the Company's control.

Moreover, pursuant to Article L. 111-67 of the French Energy Code, the State may not hold less than 70% of EDF's capital.

7.3.10 Shareholder dialogue

Institutional and individual shareholders (excluding employee shareholders) represent approximately 15% of EDF's share capital. Since the opening of the capital in November 2005, there has been ongoing dialogue with these stakeholders.

The EDF group's financial communication consists in establishing a regular dialogue with the financial markets in compliance with regulations. The objective is for the market to possess the information needed to enhance the Company's value over time, by explaining its strategy, its development model and its environment.

In this context, the Group pursues an active policy of information and dialogue, making available to the public, individual shareholders, institutional investors and, more generally, the financial community in France and abroad, a wide range of documents and information media enabling a better understanding of the Group, its strategy, results and outlook.

Relations with institutional investors and financial analysts

The purpose of this dialogue with the financial markets is to maintain a consistent and faithful image of the EDF group among analysts and investors, in particular so that the latter can assess the Group's operating and financial performance as well as its development prospects.

In 2020, as in previous years, the publication of the Group's financial results on a quarterly basis was the subject of presentations by senior management in conference calls during which it also answered questions from investors and financial analysts.

(1) The French State's shareholding in EDF includes the allocation of 328,349,361 EDF shares to the EPIC BPI Franc

(2) This percentage was calculated on the basis of the number of theoretical double voting rights, based on all shares to which voting rights are attached, including those stripped of voting rights.

In addition, throughout the year, senior management and the Financial Communications Department participated in meetings with the financial community (financial analysts and institutional investors) in the form of conference calls and roadshows. The Financial Communications Department also maintains ongoing exchanges with analysts to discuss their models and Group news.

Relations with individual shareholders

Since 2006, EDF has had a Shareholders' Consultative Committee made up of 10 members representative of the diversity of EDF's shareholder base and a Shareholders' Club, which offers visits to industrial sites as well as meetings to present the EDF group. EDF also has an EDF shareholder Facebook page to relay information directly to its shareholders.

A dedicated space exists on the Company's website edf.fr and provides shareholders with all the information they need for quality shareholder dialogue.

The Shareholders' General Meeting can be accessed remotely in real time, then replayed and a report of the proceedings is published in a special Shareholders'.

Newsletter. Shareholders may also contact the Company through a toll-free number or a dedicated e-mail address.

EDF has always paid great attention to the quality of dialogue with its shareholders and has endeavoured to provide them with innovative methods of communication.

EDF thus offered its shareholders new online content in the form of short educational videos. They are available in French and English, accessible to deaf and hard of hearing people, showing EDF's capacity to adapt during the health crisis to offer new digital communication tools.

7.4 Market for the Company's shares

The Company's shares have been listed for trading by Euronext Paris (Compartment A) since 21 November 2005, under ISIN code FR 0010242511, Reuters code (EDF. PA) and Bloomberg code (EDF: FP).

The following graph shows the changes in the Company's share price between 21 November 2005 and 31 December 2020 (base index 100 as at 21 November 2005):

The following table shows the share price and volume of EDF shares traded between 1 January 2020 and 31 January 2021 on the Euronext Paris stock market:

	Transactions		Closing price *(in euros)*	
	(in number of shares)	*(in euros*)*	Highest	Lowest
2021				
January 2021	73,299,933	856,149,046	13.50	10.28
2020				
December 2020	49,577,352	626,742,811	13.16	12.08
November 2020	69,197,085	800,609,711	12.99	10.13
October 2020	64,621,299	650,589,802	10.52	9.18
September 2020	82,254,472	703,905,282	9.03	8.13
August 2020	42,904,160	378,305,102	9.08	8.54
July 2020	60,436,686	553,544,322	9.76	8.24
June 2020	76,477,230	635,601,120	9.04	7.80
May 2020	56,460,178	420,387,744	8.01	6.91
April 2020	65,447,474	470,321,234	8.01	6.59
March 2020	120,206,779	1,059,435,600	13.43	6.40
February 2020	64,027,539	811,786,335	13.55	11.37
January 2020	50,834,398	550,759,263	11.49	9.83

* *Transactions in euros correspond to the monthly sum of the proceeds of the daily number of shares traded by the closing price on the same day (Source: Euronext).*

2020

In 2020, EDF's share price increased by +29.9%, the Euro Stoxx Utility sector index (SX6P) increased by +7.8% while the CAC 40 index decreased by -7.1%.

On 31 December 2020, the closing price of the EDF share was €12.89 (€9.93 at 31 December 2019). Its highest closing price in 2020 was €13.55 on 21 February 2020, and its lowest closing price was €6.40 on 19 March 2020.

On 31 December 2020, EDF's market capitalisation totalled €39.97 billion (compared to €30.82 billion at 31 December 2019).

2021

From the beginning of 2021 to 31 January 2021 inclusive, EDF's share price fell by -20.3%, the CAC 40 index decreased by -2.7% and the Euro Stoxx Utility (SX6P) sector index decreased by -1.1%.

On 31 January 2021, the closing price of the EDF share was €10.28. Its lowest closing price in 2021, up to 31 January 2021 inclusive, was €10.28 on 29 January 2021, and its highest closing price was €13.50 on 8 January 2021.

On 31 January 2021, EDF's market capitalisation totalled €31.87 billion.

7.5 Related-party transactions

7.5.1 Related-party transactions

The information regarding the details of the transactions concluded by the Company with related parties, as defined by the IFRS, in respect of the 2020 fiscal year, are contained in note 22 to the consolidated financial statements for the fiscal year ended 31 December 2020.

They describe:

- relations with the French state;
- relations with Engie;
- relations with Orano and public sector companies;
- the main intra-group relations.

The information on the regulated agreements and commitments referred to in Article L. 225-38 of the French Commercial Code is stated in the Statutory Auditors' special report, which is reproduced below in section 7.5.2 of this Universal Registration Document.

7.5.2 Statutory Auditor's special report on regulated agreements

Shareholders' Meeting held to approve the financial statements for the year ended 31 December 2020

This is a free translation into English of the Statutory Auditors' special report on regulated agreements that is issued in the French language and is provided solely for the convenience of English speaking readers. This report on regulated agreements should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France. It should be understood that the agreements reported on are only those provided by the French Commercial Code and that the report does not apply to those related party transactions described in IAS 24 or other equivalent accounting standards.

To the Shareholders' Meeting of Electricité de France S.A.,

In our capacity as Statutory Auditors of Electricité de France S.A. (the "**Company**"), we hereby report to you on regulated agreements.

The terms of our engagement require us to communicate to you, on the basis of information provided to us, the principal terms and conditions of those agreements brought to our attention or which we may have discovered during the course of our audit, without expressing an opinion on their usefulness and appropriateness or identifying such other agreements, if any. It is your responsibility, pursuant to Article R. 225-31 of the French Commercial Code (*Code de Commerce*), to assess the interest involved in respect of the conclusion of these agreements for the purpose of approving them.

Our role is also to provide you with the information stipulated in Article R. 225-31 of the French Commercial Code relating to the implementation during the past year of agreements previously approved by the Shareholders' Meeting, if any.

We conducted the procedures we deemed necessary in accordance with the professional guidelines of the French National Institute of Statutory Auditors (Compagnie nationale des Commissaires aux comptes) relating to this engagement. These procedures consisted in agreeing the information provided to us with the relevant source documents.

Agreements submitted to the approval of the Shareholders' Meeting

Agreements authorized and concluded during the year

Pursuant to Article L. 225-40 of the French Commercial Code, we have been notified of the following agreement which was previously authorized by your Board of Directors.

Subscription by the French State in the context of the Green OCEANE Bond issue

Persons concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF.

Nature, purpose and terms & conditions: in the context of the issue through a public offering governed by Article L. 411-2, 1° of the French Monetary and Financial Code (*Code monétaire et financier*) (so-called "by private placement"), of "Green Bonds" convertible into new shares and/or exchangeable for existing shares (the "Green OCEANE Bonds"), of a nominal amount of €2.4 billion, the French State placed an order in the order book, through Agence des participations de l'Etat, to subscribe for 40% of the issue.

The Green OCEANE Bonds subscribed by the French State, in the same way as all the Green OCEANE Bonds, are subject to the stipulations of the Green OCEANE Bonds subscription contract (the "Subscription Contract"), with payment/delivery on 14 September 2020, that is:

- the nominal value of the Green OCEANE Bonds was set at €10.93, corresponding to a premium of 32.5% above the Company's reference share price [(1)] on the Euronext Paris regulated market;
- the Green OCEANE Bonds do not bear interest (zero-coupon) and were issued at an issue price of €11.70, *i.e.* 107.00% of their nominal value, resulting in a negative annual gross yield-to-maturity of -1.68%;
- previously converted, exchanged, redeemed or repurchased and cancelled, the Green OCEANE Bonds will be redeemed at par on maturity on 14 September 2024;
- the conversion/exchange ratio is set at one share per Green OCEANE Bond, subject to standard adjustments, including anti-dilution adjustments and dividend protections.

Meeting on 7 September 2020, your Board of Directors authorized this issue and, as necessary, the conclusion by the Company of the corresponding Subscription Contract, considering that the subscription by the French State was in the Company's interests and enabled the completion of the Green OCEANE Bond issue under the best market conditions.

On 8 September 2020, the French State subscribed to the Issue in the nominal amount of €959,999,995.71, representing 40% of the Issue.

(1) The reference share price is equal to the volume-weighted average price of the EDF share on Euronext Paris from the launch of the issue on 8 September 2020 to the setting of the definitive terms (pricing) of the Green OCEANE Bonds the same day, i.e. €8.2465.

Agreements already approved by the Shareholders' Meeting

Agreements approved during previous financial years that remained in force during the past financial year

Pursuant to Article 225-30 of the French Commercial Code, we have been notified that the following agreements, previously approved by Shareholders' Meetings of prior years, have remained in force during the year.

1. Settlement agreement relating to the French State's compensation for the closure of the Fessenheim nuclear plant

Persons concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF.

Nature, purpose and terms & conditions: the protocol agreement was entered into to determine the heads of damages and the terms and conditions for the calculation of compensation payable by the French State to EDF in connection with the early closure of the Fessenheim nuclear power plant. The conclusion of this settlement agreement, signed on 27 September 2019, was authorized by the Board of Directors' meetings of 4 April and 20 September 2019.

The compensation breaks down as follows:

- initial payments corresponding to the plant's anticipated closure costs. In this respect EDF received compensation of €370 million on 14 December 2020. This compensation is recognized in the income statement in operating subsidies at the same rate as the anticipated closure costs, that is €50 million in the year ended 31 December 2020;
- further payments corresponding to lost profits that would have been generated by future production volumes, determined on the basis of the past production of the Fessenheim power plant, up to 2041, calculated ex post in accordance with the sales prices of nuclear production, and in particular observed market prices. This second category of compensation had no impact in the year ended 31 December 2020.

2. Sale agreement between EDF, AREVA SA and AREVA NP for the acquisition of 75.5% of NEW NP's (now called Framatome) capital

Persons concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF and AREVA SA, and Mr François Delattre, director of EDF and AREVA SA.

Nature, purpose and terms & conditions: following the memorandum of understanding signed on 28 July 2016, the Board of Directors, which met on 15 November 2016, had previously authorized the agreement, signed the same day, setting the terms of the sale of the interest conferring to EDF exclusive control of an entity ("NEW NP" which has become "Framatome"), 100%-held by AREVA NP, a subsidiary of AREVA SA, regrouping the activities relating to the design and manufacturing of nuclear reactors and equipment, fuel assemblies and services to the nuclear installed base within the Group.

The final acquisition agreement covering 75.5% of the capital of Framatome was authorized by your Board of Directors on 14 December 2017 and signed on 22 December 2017. The acquisition was carried out on 31 December 2017 for €1,868 million, excluding acquisition costs.

This contract may be applied following the implementation of contractual mechanisms relating to vendor warranties.

3. Other agreements signed by EDF as part of the sale by AREVA SA of its entire interest in NEW NP (now called Framatome)

Persons concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF and AREVA SA, and Mr François Delattre, director of EDF and AREVA SA.

In addition to the agreement signed by EDF, AREVA SA and AREVA NP for the acquisition of 75.5% of Framatome mentioned in the first part of this report, your Board of Directors authorized the following agreements on 23 June 2017 and 14 December 2017, which were approved by the Combined Shareholders' Meeting of 15 May 2018 held to approve the financial statements for the year ended 31 December 2017.

a) Agreement signed by EDF relating to the acquisition of 19.5% of the Framatome shares by Mitsubishi Heavy Industries (MHI)

Nature, purpose and terms & conditions: the final acquisition agreement was signed on 14 December 2017, concomitantly with the acquisition by EDF of 75.5% of the Framatome shares. It allows MHI to acquire 19.5% of Framatome from AREVA SA and AREVA NP, in the presence of EDF and under financial conditions similar to those of EDF.

The negotiations regarding the valuation of certain items of the vendor warranties granted by Areva NP and exercised by EDF and MHI are ongoing between the parties.

b) Agreement signed by EDF relating to the acquisition of 5% of the Framatome shares by Assystem

Nature, purpose and terms & conditions: the final acquisition agreement was signed on 14 December 2017, concomitantly with the acquisition by EDF of 75.5% of the Framatome shares. It allows Assystem to acquire 5% of Framatome from AREVA SA and AREVA NP, in the presence of EDF and under financial conditions similar to those of EDF.

The negotiations regarding the valuation of certain items of the vendor warranties granted by Areva NP and exercised by EDF and Assystem regarding are ongoing between the parties.

Agreements authorized during prior years but not approved by the Shareholders' Meeting

In accordance with the terms of Article R. 225-30 of the French Commercial Code, we have been notified of the following agreements, which were described in our special report on regulated agreements and commitments for fiscal years 2016 to 2019, and which were not approved by the Combined Shareholders' Meeting of 18 May 2017 held to approve the financial statements for the year ended 31 December 2016, which were continued during the period.

1. Shareholders' Agreement between EDF on the one hand, and Caisse des dépôts et consignation and CNP Assurances on the other hand, regarding Coentreprise de Transport d'Électricité - CTE, parent company of RTE

Person concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF SA, and having a representative on the Board of Directors of CNP Assurances.

Nature, purpose, and terms & conditions: this agreement, signed on 14 December 2016 and implemented on 31 March 2017 between EDF on the one hand, and Caisse des dépôts et consignation and CNP Assurances on the other hand, enabled Caisse des dépôts et Consignation and CNP Assurances to acquire an indirect interest of 49.9% in the capital of RTE, via CTE, and the set-up of the terms and conditions of a long-term partnership to encourage the development of RTE, notably by the conclusion of a Shareholders' Agreement.

This Shareholders' Agreement remained in force in fiscal year 2020.

2. Agreement entered into between the French State, EDF, the Caisse des dépôts, CNP Assurances and CTE relating to the governance of CTE and RTE

Person concerned: the French State, represented by Mr Martin Vial on the Board of Directors, a shareholder owning more than 10% of the voting rights of EDF, a party to the agreement and having a representative on the Board of Directors of CNP Assurances.

Nature, purpose and terms & conditions: the purpose of this agreement, entered into between EDF, Caisse des dépôts and CNP Assurances, CTE and the French State, is to set forth the commitment of the French State to limit its representatives to two on the Supervisory Board of RTE.

Paris La Défense, 10 March 2021,

The Statutory Auditors

KPMG S.A.
Jay Nirsimloo Michel Piette

Deloitte & Associés
Damien Leurent Christophe Patrier

7.5.3 Routine agreements procedure

On 13 February 2020, the Board of Directors approved an internal procedure, meeting the requirements of the AMF recommendation, that is primarily designed to implement the procedure required under Article L. 22-10-12 of the French Commercial Code, to regularly assess unregulated agreements (*i.e.* agreements relating to routine transactions concluded under normal conditions).

Given the high number of routine agreements concluded under normal conditions that EDF may enter into, the procedure involves:

- drawing up a list of routine agreements "by type", that do not require an assessment; this category includes agreements entered into in the normal course of EDF's business and a list of intra-group agreements;
- defining which routine agreements concluded under normal conditions require an annual assessment by the Board; this category includes agreements deemed sufficiently material for at least one of the parties to the contract; it specifically includes agreements that have been approved by the Group Executive Committee's Commitments Committee (CECEG) and agreements entered into with the French state or a public company.

The Board of Directors assesses them once a year at the Board meeting called to approve the annual financial statements, when reviewing the regulated agreements concluded over the fiscal year or agreements concluded and authorised during previous fiscal years that have been performed over the past fiscal year.

7.6 Material contracts

The information on the regulated agreements and commitments referred to in Article L. 225-38 of the French Commercial Code is contained in the Statutory Auditors' special report, which is reproduced in section 7.5.2 "Statutory Auditor's special report on regulated agreements" of this Universal Registration Document, section 7.5.5 of the 2018 Reference Document and section 7.5.4 of the 2017 Reference Document.

Except for the contracts which may be described in chapters 1 and 5 of this Universal Registration Document or in the notes to the consolidated statements for the fiscal year ended 31 December 2020, in chapters 1 and 5 of the 2017 and 2018 Reference Document or in the notes to the consolidated statements for the fiscal years ended 31 December 2017 and 2018, including the contracts described hereunder, EDF entered into no material contracts other than those concluded in the normal course of business over the last two years preceding the filing of this Universal Registration Document, the 2018 Reference Document and the 2017 Reference Document.

7.6.1 Material contracts entered into in 2020

Material contracts entered into in 2020, other than those conducted in the normal course of business, by the Group, are the followings:

- purchase agreement for Pod Point, a company specialized in electric charging station in the UK, by EDF Energy (13 Feburary 2020);
- sale agreement for Edison's E&P division entered into with Energean Oil and Gas (excluding Algeria and Norway) (17 December 2020).

7.6.2 Material contracts entered into in 2019

Material contracts entered into in 2019, other than those conducted in the normal course of business, by the Group, are the followings:

- in Switzerland, EDF sold its 25.04% stake in the Swiss energy company Alpiq (May 2019);
- in France, signature of a compensation agreement by the French state for the early closure of the Fessenheim power plant (September 2019);
- in Italy, Edison signed a binding memorandum to sell its gas exploration and production assets to Energean Oil and Gas (July 2019).

7.6.3 Material contracts entered into in 2018

Material contracts entered into in 2018, other than those conducted in the normal course of business, by the Group, are the followings:

- concession agreement for the stake in Dunkerque LNG – 30 October 2018;
- concession agreement for the 49% minority share in 24 wind power farms in the UK, representing 550MW in Dalmore Capital Limited and Pensions Infrastructure Platform – June 2018;
- sale agreement for a 450MW offshore Scottish wind farm project named "Neart na Gaoithe" – May 2018.

Crédit photo : ©EDF – Jean-Lionel Dias/ PWP

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ADDITIONAL INFORMATION

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GLOSSARY 537

8.1 Person responsible for the Universal Registration Document and the Certification

8.1.1 Person responsible for the Universal Registration Document

Jean-Bernard Lévy, Chairman and Chief Executive Officer of EDF.

8.1.2 Certification from the person responsible for the 2020 Universal Registration Document containing the annual financial report

I certify that, to the best of my knowledge, the information contained in this Universal Registration Document accurately reflects the facts and contains no omission likely to affect its meaning.

I certify that, to the best of my knowledge, the financial statements are prepared in accordance with accounting standards and that they give a true and fair view of the assets and liabilities, financial position and the income of the Company and of all the companies included in the consolidation, and that the management report included in this document presents a true and fair view of the business trends, income and financial position of the Company and of all the companies included in the consolidation and a description of the main risks and uncertainties they face.

Jean-Bernard Lévy,

Chairman and Chief Executive Officer of EDF

8.2 Auditors – Statutory Auditors

Deloitte & Associés

6, Place de la Pyramide, 92908 Paris – La Défense Cedex, represented by Mr Damien Leurent and Mr Christophe Patrier.

KPMG SA

Tour EQHO, 2, avenue Gambetta, CS 60055, 92066 Paris – La Défense Cedex, represented by Mr Jay Nirsimloo and Mr Michel Piette.

The Statutory Auditors were initially appointed by decision of the Shareholders' Meeting of 6 June 2005 for a period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2010.

Their terms of office were renewed by a decision of the Combined Shareholders' Meeting of 24 May 2011 until the Shareholders' Meeting ruling on the financial statements for the fiscal year ended 31 December 2016 then again by the Combined Shareholders' Meeting of 18 May 2017 for a further period of six fiscal years expiring at the end of the Shareholders' Meeting ruling on the financial statements covering the fiscal year closing 31 December 2022.

The aforementioned Statutory Auditors consequently certified the financial statements reproduced in this Universal Registration Document.

8.3 Publicly available documents and financial reporting calendar

The Company's press releases, annual reports, including historical financial information relating to the Company and any related updates filed with the AMF, are available on the Company's website: www.edf.fr and a copy may also be obtained at the Company's registered office at 22-30, avenue de Wagram, 75382 Paris Cedex 08 (France).

EDF's LEI number is 549300X3UK4GG3FNMO06.

All of the regulated information published by the Company, pursuant to Article 221-1 *et seq*. of the AMF's general regulation, is available at the following address: www.edf.fr

Finally, the documents and information referred to in Article R. 225-73-1 of the French Commercial Code, are available on the Company's website in the section dedicated to Shareholders' Meetings.

2020 Annual Results	**18 February 2021**
First quarter 2020 revenue	12 May 2021
Annual Shareholders' Meeting	6 May 2021
Half year 2020 Results	29 July 2021

The Company has imposed a 15-day embargo period prior to the announcement of the annual and half-year results and before the quarterly results ("quiet period") during which no new information regarding the business development and EDF's results shall be disclosed to financial analysts and investors so as to avoid the release of incomplete fnancial information enabling the recipients to anticipate EDF's results prior to their official publication.

In application of Article 19 of regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017, the following information is incorporated by reference in this Universal Registration Document:

- the main headings provided for in Appendices 1 and 2 of the delegated regulation (EU) 2019/980 of 14 March 2019 supplementing the provisions of regulation (EU) 2017/1129 of 14 June 2017;
- the information making up the annual financial report provided for in Articles L. 451-1-2 of the French Monetary and Financial Code and 222-3 of the general regulations of the AMF (French Financial Markets Authority);
- the information making up the management report of the Board of Directors provided for by the French Commercial Code; the information making up the statement of non-financial performance (DPEF) provided for by the French Commercial Code;

the 2019 Universal Registration Document of the EDF group filed with the AMF on 13 March 2020 under number D-20-0128 (2019 Reference Document) www.edf.fr; the 2018 Reference Document of the EDF group filed with the AMF on 15 March 2019 under number D-19-157 (2018 Reference Document) www.edf.fr;

- the EDF group's consolidated financial statements (under international accounting standards) for the year ended 31 December 2019 and the Statutory Auditors' report on those financial statements, which are to be found in chapter 6, sections 6.1 (pages 278 to 393) and 6.2 (pages 394 and 398) of the EDF group's 2019 Reference Document;
- the EDF group's consolidated financial statements (under international accounting standards) for the year ended 31 December 2018 and the Statutory Auditors' report on those financial statements, which are to be found in chapter 6, sections 6.1 (pages 314 to 429) and 6.2 (pages 430 and 432) of the EDF group's 2018 Reference Document;
- the review of the EDF group's financial position and results for the year ended 31 December 2019, as presented in chapter 5 (pages 244 to 275) of the EDF group's 2018 Reference Document;
- the review of the EDF group's financial position and results for the year ended 31 December 2018, as presented in chapter 5 (pages 278 to 312) of the EDF group's 2018 Reference Document.

8.4 Concordance tables

8.4.1 Concordance table with Appendix I of (EC) regulation no. 2019/980

The correlation table below identifies the information required by Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019 in accordance with the URD scheme:

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019.	Sections of the 2020 URD document
1. Persons responsible, information from third parties, expert report and approval by the competent authority	
1.1. Name and address of the persons responsible	8.1
1.2. Certification by the persons responsible	8.1
1.3. Name, address, qualifications and potential interests of persons acting as experts	n/a
1.4. Certification of third party information	n/a
1.5. Declaration without prior approval of the competent authority	page 2
2. Statutory Auditors	
2.1. Name and address of the Statutory Auditors	Section 8.2
2.2. Changes where applicable	n/a
3. Risk factors	**Section 2.2**
4. Information about the issuer	
4.1. Legal and commercial name of the issuer	Section 7.1.1
4.2. Location, registration number and LEI of the issuer	Sections 7.1.2 and 8.3
4.3. Date of incorporation and length of life of the issuer	Section 7.1.3
4.4. Registered office and legal form of the issuer, legislation governing the activities, country of origin, address and telephone number of the registered office, website with a disclaimer	Section 7.1.1 and 7.1.4
5. Business overview	
5.1. Main activities	
5.1.1. Nature of the operations	Section 1.4
5.1.2. Important new products and services	n/a
5.2. Major markets	Section 1.4
5.3. Key events	Section 5.1.2 and 5.1.3
5.4. Strategy and objectives	Sections 1.3 and 5.4
5.5. Dependency of the issuer on patents, licenses, contracts and manufacturing processes	Sections 1.5 and 2.1
5.6. Competitive position declaration	Sections 1.4.2.1
5.7. Investments	
5.7.1. Major investments made	Key figures and 5.1.5.1.1.3
5.7.2. Principal ongoing or future investments of the issuer for which the latter's management bodies have already made firm commitments and adopted financing methods	Sections 1.3.1 and 5.1.3.5
5.7.3 Joint ventures and commitments in which the issuer holds a significant share of the capital	Section 4.5.1 and Section 6.1-Appendix to the consolidated financial statements – Note 12
5.7.4. Environmental issues	chapter 3
6 Organisational structure	
6.1. Brief description of the Group	Section 1.2.1 and 1.2.2
6.2. List of significant subsidiaries	Section 1.2.1
7 Operating and financial review	
7.1. Financial position	
7.1.1. Changes in results and financial position including key performance indicators of a financial and, where applicable, non-financial nature	Sections 5 and 6 Sections 3 and 8.4.4
7.1.2. Forecasts for future development and research and development activities	Section 1.5
7.2. Operating results	Section 6.1
7.2.1. Important factors, unusual or infrequent events or new developments	Sections 1.2.3, 5.1.2 and 5.1.3
7.2.2. Explanation of material changes in net sales or revenue	Section 5.1.4

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019.	Sections of the 2020 URD document
8. Cash and capital resources	
8.1. Capital Information	Sections 7.2 and 7.3
8.2. Cash flows	Section 6.1 – Appendix to the consolidated financial statements – Note 10.4, 10.7 and 13.1
8.3. Financing needs and structure	Section 6.1- Appendix to the consolidated financial statements – Note 18.3
8.4. Restrictions on the use of capital resources	n/a
8.5. Expected sources of financing	n/a
9. Regulatory environment	
9.1. Description of the regulatory environment and any measures or factors of an administrative, economic, budgetary, monetary, or political nature	Sections 1.4 and 1.3
10. Trend information	
10.1. Description of major trends and any significant changes in the Group's financial performance since the end of the last fiscal year	Sections 5.2, 5.4 and 6.6.2
10.2. Events that are reasonably likely to have a material effect on prospects	Section 5.4
11. Profit forecasts or estimates	
11.1. Published profit forecasts or estimates	n/a
11.2. Declaration outlining key forecasting assumptions	Sections 5.1.2 and 5.1.3
11.3. Declaration regarding comparability with historical financial information and compliance of accounting methods	Section 6.1 – Appendix to the consolidated financial statements – Note 1.4
12. Administrative, management, and supervisory bodies and executive management	
12.1. Information regarding members	
Name, professional address and functions	Sections 4.2.1 and 4.3.1
Nature of any family relationship	Section 4.4
Expertise and experience	Sections 4.2.1 and 4.3.1
Absence of conviction	Section 4.4.2
12.2. Conflict of interest	Section 4.4.1
13. Remuneration and benefits	
13.1. Remuneration paid and benefits in kind	Sections 4.6.1 and 4.6.2
13.2. Amounts set aside or accrued to provide pension, retirement	Section 4.6.1.1.3
14. Functionning of administrative and management bodies	
14.1. Date of expiration of the current terms of office	Section 4.2.2.1
14.2. Service contracts entered into by members of the administrative or management bodies and the issuer	Section 4.4.3
14.3. Information about audit and remuneration committees	Section 4.2.3
14.4. Statement of compliance with the corporate governance regime in force	Section 4.1
14.5. Potential significant impacts on corporate governance	Section 4.2.2
15. Employees	
15.1. Number of employees	Section 3.4.2.1.1
15.2. Shareholdings and stock options	n/a
15.3. Agreement providing for employee shareholding	n/a
16. Major shareholders	
16.1. Shareholders holding more than 5% of the capital on the date of the registration document	Section 7.3.8
16.2. Breakdown of voting rights	Section 7.2.4
16.3. Direct or indirect control	Section 7.3
16.4. Agreement whose implementation could lead to a change of control	Section 7.3.9
17. Transactions with related parties	**Section 7.5**
18. Financial information concerning the issuer's assets and liabilities, financial position and results	
18.1. Historical financial information	
18.1.1. Audited historical financial information for the last three fiscal years and the audit report	Section 6.1
18.1.2. Change of accounting reference date	n/a
18.1.3. Accounting standards	Section 6.1
18.1.4. Change in accounting principles	n/a

Appendices 1 and 2 of the delegated regulation (EC) no. 2019/980 of 14 March 2019.	Sections of the 2020 URD document
18.1.5. Financial information under French accounting standards	Section 6.1
18.1.6. Consolidated financial statements	Section 6.1
18.1.7. Date of the latest financial information	n/a
18.2 Interim and other financial information	
18.2.1. Quarterly or half-yearly financial information	n/a
18.3. Audit of historical annual financial information	
18.3.1. Independent audit of historical annual financial information	Section 6.2
18.3.2. Other audited information	n/a
18.3.3. Sources and reasons for unaudited information	n/a
18.4. *Pro forma* financial information	n/a
18.5. Dividend policy	
18.5.1. Description of the dividend policy and any applicable restrictions	Section 6.5
18.5.2. Amount of dividend per share	Section 6.5.1
18.6. Administrative, judicial and arbitration proceedings	Section 2.2.1, 7.1.5 and 6.1 – Notes to the consolidated financial statements
18.7. Significant change in the financial position	Section 6.6.2
19. Additional information	
19.1. Share capital	
19.1.1. Amount of subscribed capital, number of shares issued and fully paid up and par value per share, number of shares authorised	Section 7.3.1, 7.3.3 and Section 6.1- Appendix to the consolidated financial statements – Note 14
19.1.2. Information on shares not representing the share capital	Section 7.3.5
19.1.3. Number, book value and par value of the shares held by the issuer	Sections 7.3.1 et 7.32
19.1.4. Information on convertible or exchangeable securities or securities with subscription warrants,	n/a
19.1.5. Information on conditions governing any right of acquisition and/or obligation attached to authorised but unissued share capital or any endeavour to increase the share capital	Sections 7.2.4, 7.2.5 and 7.3.3
19.1.6. Information about the share capital owned by any member of the Group which is under option or subject to a conditional or unconditional agreement to be put under option and characteristics of such options	Section 7.3.6
19.1.7. History of the Company's share capital	Section 7.3.1
19.2. Incorporation documents and articles of association	
19.2.1. Register and company purpose	Sections 7.1.2 and 7.2.1
19.2.2. Rights, privileges and restrictions attached to each class of shares	Section 7.2.4
19.2.3. Provision delaying, deferring or preventing a change of control	Section 7.2.9
20. Material contracts	**Section 7.6**
21. Available documents	**Section 8.3**

8.4.2 Concordance table with the management report

This Universal Registration Document includes the elements of the Board of Directors' management report relating to the 2020 fiscal year as provided for in Articles L. 225-100 *et seq*. of the French Commercial Code. The management report is composed of the sections of the Universal Registration Document referred to in the following table:

Required topics	Reference texts	Chapter of the Universal Registration Document
1. Situation and activity of the Group		
1.1. Situation of the Company during the past fiscal year and an objective and exhaustive analysis of the development of the business, results and financial situation of the Company and the Group, in particular its debt situation, in relation to the volume and complexity of the business	Article L. 225-100-1, par. I.1°, Article L. 232-1, II., Article L. 233-6 and Article L. 233-26 of the French Commercial Code	Chapter 5
1.2. Key indicators of financial performance	Article L. 225-100-1, I., 2° of the French Commercial Code	Key figures and Chapter 5
1.3. Key indicators of financial and non-financial performance relevant to the particular business of the Company and the Group, including information relating to environmental and employee-related matters	Article L. 225-100-1, I., 2° of the French Commercial Code	Chapter 3 and concordance table Section 8.4.4

Required topics	Reference texts	Chapter of the Universal Registration Document
1.4. Key events arising between the end of the fiscal year and the date the management report was written	Article L. 232-1, II and Article L. 233-26 of the French Commercial Code	Section 5.1.2 and 5.1.3
1.5. Identity of the main shareholders and holders of voting rights at General Meetings and changes during the fiscal year	L. 233-13 of the French Commercial Code	Section 7.3 and 7.2.4
1.6. Existing branches	Article L. 232-1-II of the French Commercial Code	Section 6.6.4
1.7. Acquisition of significant equity holdings in companies having their registered office on the French territory	L. 233-6 al.1 of the French Commercial Code	Section 5.1.3 and Note 3 of the Appendix to the consolidated financial statements
1.8. Disposal of cross-shareholdings	L. 233-29, L. 233-30 and R. 233-19 of the French Commercial Code	NA
1.9. Foreseeable development and future prospects of the situation of the Company and the Group	Article L. 232-1-II and Article L. 233-26 of the French Commercial Code	Section 5.4
1.10. Research and development activities	Article L. 232-1-II and Article L. 233-26 of the French Commercial Code	1.5
1.11. Table showing the Company's results over each of the last five fiscal years	Article R. 225-102 of the French Commercial Code	Section 6.6.1
1.12. Information concerning supplier and customer payment periods	Article D. 441-4 of the French Commercial Code	Section 6.6.3
1.13. Amount of intercompany loans granted and statement from the Statutory Auditor	Article L. 511-6 and R. 511-2-1-3 of the French Monetary and Financial Code	n/a
2. Internal control and risk management		
2.1. Description of the main risks faced by the Company	Article L. 225-100-1, I., 3° of the French Commercial Code	Section 2.2
2.2. Information on the financial risks related to the effects of climate change and the measures that the Company is taking to reduce them by implementing a low-carbon strategy in all components of its activity	Article L. 22-10-35, 1° of the French Commercial Code	Section 2.2.3 Section 3.1
2.3. Main characteristics of the Internal control and risk management procedures implemented by the Company and the Group relating to the preparation and processing of accounting and financial information	Article L. 22-10-35, 2° of the French Commercial Code	Section 2.1
2.4. Information on the objectives and policy regarding the hedging of each main category of transactions and on the exposure to price, credit, liquidity and treasury risks, including the use of financial instruments	Article L. 225-100-1, 4° of the French Commercial Code	Section 5.1.6
2.5. Anti-corruptions provisions	"Sapin II" Act no. 2016-1691 of 9 December 2016	Section 3.3.2
2.6. Vigilance plan and reporting on its effective implementation	Article L. 225-102-4 of the French Commercial Code	Section 3.6
3. Report on Corporate governance		**See concordance table section 8.4.3**
4. Share ownership and capital		
4.1. Structure, changes in the Company's capital and crossing of thresholds	Article L. 233-13 of the French Commercial Code	Section 7.3
4.2. Acquisition and disposal by the Company of its own shares	Article L. 225-211 of the French Commercial Code	Section 7.3.2
4.3. Overview of employee share ownership on the last day of the fiscal year (proportion of capital represented)	Article L. 225-102 al 1 of the French Commercial Code	Section 3.5.1.1 Section 7.3.8
4.4. References to potential adjustments for the securities giving access to the share capital in the case of share repurchases or financial operations	Article R. 228-90 and R. 228-91 of the French Commercial Code	n/a
4.5. Information on operations made on the Company's shares by managers and related persons transactions	Article L. 621-18-2 of the French Monetary and Financial Code	Section 4.5.2
4.6. Amount of dividend paid out over the past three fiscal years	Article 243 *bis* of the French General Tax Code	Section 6.5.1
5. Non-financial performance statement		**See concordance table section 8.4.4**
6. Other information		

Required topics	Reference texts	Chapter of the Universal Registration Document
6.1. Additional tax information	Article 223 *quater* and 223 *quinquies* of the French General Tax Code	n/a
6.2. Injunctions or fines as a result of anti-competitive practices	Article L. 464-2 of the French Commercial Code	n/a

8.4.3 Concordance table with the elements of the EDF Board of Directors' report on corporate governance

This Universal Registration Document includes all the elements of the Company's Board of Directors' report pursuant to Article L. 225-37 of the French Commercial Code. The Board's report on corporate governance is composed of the sections of the Universal Registration Document referred to in the following table and is included in the management report in a section on Corporate governance:

Corporate Government/Corporate Officers Section including elements contained in the report on corporate governance	Reference texts	URD Sections
Information on the compensations		
3.1. Policy regarding remuneration of corporate officers	Article L. 22-10-8 I al 2 of the French Commercial Code	Section 4.6.1
3.2. Remuneration and benefits of any kind paid during the fiscal year or granted in respect of the fiscal year to each corporate officer	Article L. 22-10-9, I., 1° of the French Commercial Code	Sections 4.6.1 and 4.6.2
3.3. Share of the fixed remuneration and variable remuneration	Article L. 22-10-9, I., 2° of the French Commercial Code	Section 4.6.1
3.4. Use of the option of claiming back variable compensation	Article L. 22-10-9, I., 3° of the French Commercial Code	Section 4.6.1.1
3.5. Commitments of any kind entered into by the Company for the benefit of its corporate officers, corresponding to items of compensation, indemnities or benefits due or likely to be due as a result of the assumption, termination or change of their duties or subsequent to the carrying out of such duties	Article L. 22-10-9, I., 4° of the French Commercial Code	Section 4.6.1.1
3.6. Compensation paid or granted by a company included in the scope of consolidation within the meaning of Article L. 233-16 of the French Commercial Code	Article L. 22-10-9, I., 5° of the French Commercial Code	Section 4.6.2.3
3.7. Ratio between the level of remuneration of each corporate officer and the average and median compensation of employees	Article L. 22-10-9, I., 6° of the French Commercial Code	Section 4.6.1
3.8. Annual changes in compensation, in the Company's performance, in the average compensation of the Company's employees and in the aforementioned ratios over the five most recent fiscal years	Article L. 22-10-9, I., 7° of the French Commercial Code	Section 4.6.1
3.9. Explanation of how the total remuneration complies with the adopted remuneration policy, including how it contributes to the long-term performance of the Company and how the performance criteria have been applied	Article L. 22-10-9, I., 8° of the French Commercial Code	Section 4.6.1
3.10. Manner in which the vote of the last Ordinary General Meeting provided for in paragraph II of Article L. 225-100 (until 31 December 2020) then in paragraph I of Article L. 22-10-34 (from 1st January 2021) of the French Commercial Code was taken into account	Article L. 22-10-9, I., 9° of the French Commercial Code	Section 4.6.1
3.11. Deviation from the procedure for implementing the remuneration policy and exceptions	Article L. 22-10-9, I., 10° of the French Commercial Code	n/a
3.12. Application of the provisions of the second paragraph of Article L. 225-45 of the French Commercial Code (suspension of payment of Directors' remuneration in the event of failure to comply with the gender mix of the Board of Directors)	Article L. 22-10-9, I., 11° of the French Commercial Code	n/a
3.13. Attribution and conservation of stock-options by the corporate officers	L. 225-185 of the French Commercial Code	n/a
3.14. Attribution and conservation of free shares to corporate officers	Article L. 225-197-1 and Article L. 22-10-59 of the French Commercial Code	Section 4.6.4
Information on governance		
3.15. List of all mandates and positions held in all companies by each corporate officer during fiscal year	Article L. 225-37-4, 1° of the French Commercial Code	Sections 4.2 and 4.3
3.16. Agreements concluded between a manager or a major shareholder and a subsidiary	Article L. 225-37-4, 2° of the French Commercial Code	Section 7.5Notes 12 and 22 of the Appendix to the consolidated financial statements
3.17. Summary table of the outstanding delegations given by the Shareholders' Meeting to perform capital increases	Article L. 225-37-4, 3° of the French Commercial Code	Section 7.3.3

Corporate Government/Corporate Officers Section including elements contained in the report on corporate governance	Reference texts	URD Sections
3.18. Method of Executive Management	Article L. 225-37-4, 4° of the French Commercial Code	Sections 4.2.2 and 4.3.1
3.19. Membership, conditions for the preparation and organisation of the Board of Directors' work	Article L. 22-10-10, 1° of the French Commercial Code	Section 4.2
3.20. Principle of balanced representation of women and men on the Board of Directors	Article L. 22-10-10, 2° of the French Commercial Code	Section 3.3.3.1
3.21. Limits placed by the Board on the powers of the Chief Executive Officer	Article L. 22-10-10, 3° of the French Commercial Code	Sections 4.2.2 and 7.2.9
3.22. Reference to the Corporate Governance Code and implementation of the "comply or explain" principle	Article L. 22-10-10, 4° of the French Commercial Code	Section 4.1
3.23. Specific procedures relating to the participation of shareholders in the Shareholders' Meeting	Article L. 22-10-10, 5° of the French Commercial Code	Section 7.2.8
3.24. Evaluation procedure for current agreements – Implementation	Article L. 22-10-10, 6 of the French Commercial Code	Section 7.5.3
3.25. Information likely to have an impact in the event of a takeover bid or exchange offer	Article L. 22-10-11 of the French Commercial Code	Sections 7.2 and 7.3

8.4.4 Concordance table with the statement of non-financial performance

This Universal Registration Document includes the statement of non-financial performance for the 2020 fiscal year prepared in accordance with Articles L. 22-10-36 and R. 225-105 of the French Commercial Code.

Thus, to the extent necessary to understand the Company's position, the evolution of its business, its economic and financial results and the impact of its activity, the Statement of Non Financial Statement (DPEF) presents information on how the Company and the Group take into account the social and environmental consequences of their activities, as well as the effects of these activities on respect for human rights and the fight against corruption and tax evasion.

The DPEF is hence made up of the sections of the Universal Registration Document identified in the table below:

	Topics	Reference texts	URD Sections
5.1.	Business model	Article L. 233-13 of the French Commercial Code	Sections 1.1 and 1.4
5.2.	Description of the main risks relating to the activity of the Company or the Group, including – if relevant and proportionate – risks due to its business relationships, products or services	Article L. 225-102-1 and R. 225-105, I. 1° of the French Commercial Code	Chapter 3 and Section 2.2
5.3.	Information on how the Company or Group takes into account the social and environmental consequences of its activity, and the effects of this activity in terms of respect for human rights and the fight against corruption (description of the policies applied and due diligence procedures implemented to prevent, identify and mitigate the main risks related to the Company's or Group's activity)	Article L. 225-102-1, III, R. 225-104 and R. 225-105, I. 1° of the French Commercial Code	Chapter 3
5.4.	Results of the policies applied by the Company or Group, including key performance indicators **High-stake CSR topics from the materiality matrix**	Article L. 225-102-1 and R. 225-105, I. 3° of the French Commercial Code **Key performance indicators**	Chapter 3
	Carbon trajectory	EDF group direct greenhouse gas emissions (scope 1) √	Section 3.1.1
		Carbon intensity: specific CO_2 emissions due to electrical generation	Section 3.1.1
		Installed net renewable electricity generating capacities	Section 3.1.1
	Carbon offsetting	Qualitative evaluation	Section 3.1.1.5
	Adapting to climate change	Qualitative evaluation	Section 3.1.2
	Developping electricity use and energy services	Number of smart meters installed	Section 3.1.4
		EDF group's Electric Vehicles rate in the fleet of light vehicles	Section 3.1.4
	Biodiversity	Achievement rate of Group commitments under the "Act4nature international" scheme	Section 3.2.1
	Soils	Qualitative evaluation	Section 3.2.2
	Water	Water intensity: water consumed/electricity generated by fleet	Section 3.2.3
	Radioactive waste – Circular economy	France: volume of long-lived high and intermediate level solid radioactive waste	Section 3.2.4
		UK: volume of low level radioactive solid waste generated	Section 3.2.4

	Topics	Reference texts	URD Sections
	Nuclear safety, health and security	Nuclear safety: Number of significant level 2 events on the INES scale	Section 3.3.1
		Overall LTIR (employees and service providers)	Section 3.3.1
		Number of fatal accidents connected to business-specific risks (employees and service providers)	Section 3.3.1
	Ethics and human rights	Proportion of executives who have completed the anti-corruption training programme	Section 3.3.2
	Equality, diversity and inclusion	Gender balance index: percentage of women in the Management Committees of the Group's entities	Section 3.3.3
		Percentage of employees who attended a training during the year	Section 3.3.3
		Rate of employees covered by a collective bargaining agreement	Section 3.3.3
	Energy poverty and social innovation	Number of energy support	Section 3.3.4
	Dialogue and consultation with stakeholders	Proportion of projects on which there is consultation in accordance with the Equator Principles (%)	Section 3.4.1
	Local development	Annual rate of procurement from SMEs (%)	Section 3.4.2
	Development of industrial sectors	Qualitative evaluation	Section 3.4.3
	Digital technology	Number of customer visits on digital consumption monitoring platforms (millions)	Section 3.4.4
5.5.	Social information (employment, work organisation, health and safety, social relations, training, equal treatment)	Article L. 225-102-1 and Article R. 225-105-II A. 1° of the French Commercial Code	Sections 3.3.3, 3.5.2.4,3.4.2.1 and 3.1.3
5.6.	Environmental information (general environmental policy, pollution, circular economy, climate change)	Article L. 225-102-1 and Article R. 225-105-II A. 2° of the French Commercial Code	Sections 3.1.3, 3.2.1 and 3.3.1
5.7.	Societal information (societal commitments in favour of sustainable development, subcontracting and suppliers, fair practices)	Article L. 225-102-1 and Article R. 225-105-II A. 3° of the French Commercial Code	Section 3.4.2
5.8.	Informations relating to the fight against corruption	Article L. 225-102-1 and Article R. 225-105-II B. 1° of the French Commercial Code	Section 3.3.2.2
5.9.	Information on human rights actions	Article L. 225-102-1 and Article R. 225-105-II B. 2° of the French Commercial Code	Sections 3.6 and 3.3.2
5.10.	Specific information: ■ Technological accident risk prevention policy implemented by the Company; ■ Ability of the Company to cover its civil liability with regard to property and persons as a result of the operation of such facilities; ■ Resources allocated by the Company to ensure the management of compensation for victims in the event of a technological accident for which it is liable	Article L. 225-102-2 of the French Commercial Code	Sections 2.1.2.6 and 3.5.2.5.5
5.11.	Collective agreements concluded within the Company and their impact on the economic performance of the Company and working conditions of employees	Article L. 225-102-1, III and Article R. 225-105 of the French Commercial Code	Section 3.5.2.4.2
5.12.	Attestation of the independent third party body on the information contained in the statement of non-financial performance (DPEF)	Article L. 225-102-1, III and Article R. 225-105-2 of the French Commercial Code	Section 3.9.7

✓ *2020 indicator subject to reasonable assurance check by KPMG SA.*

8.4.5 Concordance table with the annual financial report

This Universal Registration Document includes the annual financial report for the 2020 fiscal year. It has been prepared in application of Articles L. 451-1-2 of the French Monetary and Financial Code and Article 222-3 of the AMF general regulation. The annual financial report is composed of the sections of the Universal Registration Document referred to in the following table:

Topics	Sections of the Universal Registration Document
1. EDF annual financial statements	Section 6.3
2. EDF group consolidated financial statements	Section 6.1
3. management report (minimum information within the meaning of Article 222-3 of the general regulations of the AMF (French Financial Markets Authority)	Section 8.4.2
4. Statement by the persons responsible for the annual financial report	Section 8.1.2
5. Statutory Auditors' report on the EDF's financial statements and the consolidated financial statements	Sections 6.2 and 6.4

Glossary

IAEA	International Atomic Energy Agency based in Vienna (Austria).
ANDRA	National agency for radioactive waste. In France, radioactive waste is managed by the National Agency for Radioactive Waste Management (ANDRA), a public industrial and commercial institution created under the French law of 30 December 1991.
ASN	Nuclear safety authority.
Assembly/Fuel	Nuclear fuel is in the form of an assembly made up of an array of 264 fuel rods, bound together by a rigid structure made of tubes and grids. Each fuel rod consists of a water-tight zirconium tube into which uranium oxide pellets are piled, constituting the fuel. The assemblies are loaded side by side into the reactor vessel – 205 assemblies are required for a 1,500MW reactor – to make up the core of the reactor. During operation, these assemblies are crossed by bottom to top with primary water which heats on contact and carries this energy to the steam generators.
Becquerel (Bq)	International legal unit for measuring radioactivity. The Becquerel (Bq) is equal to one disintegration per second. The activity represented by this unit is so low that multiples of it are used: the MBq (megabecquerel or million Becquerels) and the GBq (gigabecquerel or billion Becquerels).
Biogas	Gas generated from the fermentation of organic animal or plant matter
Biomass	Technologies based on biomass mainly consists of burning certain types of waste, particularly from the timber and farming industries, or exploiting wood fuel forests, to produce heat or electricity.
Cogeneration	Generation technique for combined electricity and heat generation. The advantage of cogeneration is the ability to capture the heat produced by the fuel whereas in traditional electricity generation this heat is lost. This process also allows the same facility to meet the heating (hot water or steam) and electricity needs of both industrial and local authority customers. This system improves the energy efficiency of the generation process and reduces fuel use by an average of 20%.
Metering	A system allowing for the recording, at a given network connection point, of the volumes of electricity transmitted or distributed (power, frequency, active and reactive energy).
Congestion	Situation in which an interconnection linking the national transmission grids cannot absorb all of the physical flows resulting from international exchanges required by market operators due to a shortage of capacity in the interconnection and/or the national transmission grids involved.
CRE	French energy regulatory Commission. (CRE). Set up on 30 March 2000, the CRE is an independent administrative authority responsible for contributing to the proper functioning of the electricity and natural gas markets in the interests of final consumers. In this respect, the CRE ensures, in particular, that the conditions for access to electricity and natural gas transmission and distribution networks do not impede the development of competition. The CRE has significant powers: the power to make proposals, advisory powers and decision-making powers. In particular, the CRE proposes regulated tariffs for the sale of electricity. The CRE has decision-making power to set the Tariffs for Using the Public Transmission and Distribution Networks (TURPE). The CRE is also vested with very broad powers that enable it to investigate and obtain any information that it may deem useful for the fulfilment of its remit, as well as authority to settle disputes and to apply penalties.
Combined-Cycle Gas	The most recent technology for generating electricity in a natural gas-fired plant. A combined cycle is made up of one or more combustion turbines and a steam turbine allowing for an improved yield. The syngas is routed to the combustion turbine, which generates electricity and very hot exhaust gases (effluents). The heat from the exhaust gases is recovered by a boiler, thus producing steam. Part of the steam is then recovered by the steam turbine to generate electricity.
Fuel Cycle	The nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it. The cycle can be broken down into three stages: ● upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years); ● the core of the cycle corresponding to the use of fuel in the reactor: receipt, loading, operation and discharging (which takes three to five years); ● downstream: pool storage, reprocessing of spent fuel in reactors of recoverable material, vitrification of highly radioactive waste, then temporary storage of the waste before storage.

Waste	The nuclear generation of 1MWh of electricity (equivalent to the monthly consumption of two households) produces around 11g of total waste across all categories. Short-lived waste represents more than 90% of the total, but contains only 0.1% of the radioactivity of waste. Accordingly, based on their level of radioactivity, they are separated into two sub-categories: Low-Level waste and Very-Low-Level waste. Long-Lived Medium and High-Level waste are produced in low quantity (less than 10% of the total quantity), but they contain almost all of the radioactivity of the waste (99.9%).
Plant availability	Fraction of power available, out of theoretical maximum energy, counting only technical unavailability. The availability coefficient (Kd) is defined as the ratio between annual actual generation capacity (or amount producible annually) and maximum theoretical generation capacity, where maximum theoretical generation capacity = installed capacity × 8,760 hours. The Kd, which counts only technical non-availability, *i.e.*, scheduled shutdowns, unplanned outages and testing periods, characterises a plant's industrial performance.
Disruption	Voluntary reduction of electrical power by a customer, in exchange for compensation. It is called "diffused" when it is due to the aggregation of small consumption sites.
LDC	French Local Distribution Companies. LDCs sell and deliver electrical energy to end users located in their exclusive service area.
Renewable energies	Energies for which production does not require extinction of the initial resource. They include hydro, wind, solar, marine (the energy produced by marine waves and currents), geothermal (energy derived from the heat below the earth's magma) energies, and bio-mass (energy derived from living matter, particularly wood and organic waste). They often include energy from the incineration of household or industrial waste.
Enrichment	Process to increase the fissile content of an element. In its natural state, uranium is 0.7% uranium 235 (fissile) and 99.3% uranium 238 (non fissile). To enable its efficient use in a pressurised water reactor, it is enriched with uranium 235 whose proportion is increased to around 4%.
Intermediate Storage	Intermediate stage in the process of managing nuclear waste. It involves placing waste packages in a facility to ensure, for a given period of time, their isolation from contact with man and the environment with the intention of retrieving them for a further stage in the waste management process. Intermediate storage facilities are designed, built and managed by the producers of such waste (EDF, AREVA NC (ex-COGEMA) and CEA) and are close to areas where waste is conditioned.
EPR	European Pressurised Reactor. The latest generation of reactors currently under construction (known as "generation 3"), it is the result of Franco-German cooperation, and offers advanced safety, environmental and technical performance.
Fluorination (conversion)	Also called "conversion", fluorination allows for the purification of uranium compounds and their transformation into uranium hexafluoride (UF6), allowing their enrichment using current techniques.
Electricity supply	Electricity demand can be broken down into four types of consumption: ● the "basic" (or "ribbon") supply of electricity, which is generated and consumed throughout the year; ● "semi-basic" supply is the electricity generated and consumed over the winter period; ● "peak" supply corresponds to periods of the year when electricity generation or supply is in heavy demand; ● "lace" supply is a complement to "ribbon" supply.
Greenhouse gases (GHG)	Gas that retains a portion of the solar radiation in the atmosphere and for which an increase in emissions due to human activity (man-made emissions) causes an increase in the earth's average temperature and plays an important role in climate change. The Kyoto Protocol covers the seven following principal greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrogen protoxide (N_2O), hydrofluorocarbons (HFC), perfluorated hydrocarbons (PFC), sulfurhexafluoride (SF_6) and, since 2013, nitrogen trifluoride (NF_3).
Liquefied Natural Gas (LNG)	Natural gas turned into liquid form by reducing its temperature to 162°C allowing for a reduction by 600 in its volume.
Man-sievert	Unit expressing the collective equivalent dose. A man-sievert is the collective dose from exposure of 1,000 men to 1mSv (milliesievert).
INB	Basic Nuclear Facilities.
Interconnection	Electricity transmission infrastructure that allows for exchanges of energy between different countries, by connecting the transmission network of one country to that of a neighbouring country.
Balancing Mechanism	Created by RTE on 1 April 2003, the balancing mechanism allows it to use power reserves that can be mobilised in the event of an imbalance between supply and demand.
Microgrid	Microgrids are small power grids designed to provide a reliable supply of electricity to a small number of consumers. They combine multiple local and diffuse production facilities, consumption facilities, storage facilities and tools for supervision and demand management. They can be connected directly to a distribution network or operate disconnected from the network (islanding).
MW – MWh	The megawatt-hour (MWh) is the energy unit generated by a facility and is equal to the facilities' power, expressed in megawatts (MW), multiplied by the duration of operations in hours. 1MW = 1,000 kilowatts = 1 million watts 1MWh = 1MW produced for 1 hour = 1 megawatt-hour 1GW = 1,000MW = 1 billion watts 1TW = 1,000GW
MWh cumac	The MWh cumac is the certificate energy unit of counting which corresponds to the cumulative energy savings aggregated on the operations' lifetime.
Series	In the nuclear field, a series of plants means a set of nuclear plants with identical generation capacity. EDF's PWR model is divided into three series of available electrical power: the 900-MW series (34 tranches of approximately 900MW each), the 1,300-MW series (20 tranches) and the 1,450-MW series (4 tranches).
Plutonium (Pu)	Element with the atomic number of 94 (number of protons) and no naturally occurring isotopes (elements whose atoms possess the same number of electrons and protons – thus the same chemical properties – but a different number of neutrons). Plutonium 239, a fissile isotope, is produced in nuclear reactors from uranium 238.
Producible hydropower generation	Maximum energy that hydropower facilities may produce using contributions under normal hydraulicity conditions. However, generation from hydroelectric facilities does vary, sometimes markedly, from one year to the next depending on hydraulicity (rainfall and snowfall). In dry years, the generation index may vary by 20% or more from the standard level.

Radiation protection	At a power plant, ionising radiation sources are numerous: the fuel itself, equipment activated by neutron flux (particularly that which is close to the core, such as tanks or lids) and particles from corrosion of the primary circuit of reactors and carried by the primary fluid. The level of exposure of a person is quantified by the dose equivalent in Sieverts (Sv). The total dose equivalents, called "collective dosimetry" and expressed in man-sieverts, is used as an indicator of dose received by all participating persons. The mobilisation of stakeholders has allowed a continuous improvement of performance on the protection of employees against the effects of ionising radiation.
Distribution network	Downstream of the transmission network, medium- and low-voltage distribution networks serve end-users (residential, local authorities, SMEs, SMIs, etc.).
Transmission network	Network providing for the transmission of electrical power at High and Very High Voltages from the generating sites to the distribution networks or industrial sites directly connected to it; this includes the major interconnection transmission network (400,000 volts and 225,000 volts) and the regional distribution networks (225,000 volts, 150,000 volts, 90,000 volts and 63,000 volts).
Entity Responsible for Balance	Entities with which RTE signs a contract for the financing of shortfalls between forecast and actual consumption and production of a portfolio of users brought together by the entity responsible for balance which plays a role of insurer covering the potential losses arising from the many differences between over- and under-supply.
Reprocessing	Reactor burnt fuel reprocessing aimed at separating materials that can be recycled (uranium and plutonium) from final waste.
Systems services	Systems services are services provided to users (consumers or electricity producers) through the joint action of the electricity transmission network operator RTE and the producers. They are intended to regulate frequency and voltage in order to maintain the balance between electric consumption and generation at all times. They are created by RTE from elementary contributions from producers, *i.e.* primary and secondary reserves provided to RTE. RTE remunerates the producers for these auxiliary services before reinvoicing these services *via* the tariff to use the network under the rules defined by the Union for the Coordination of Transmission of Electricity (UCTE).
Smart city	The smart city is a new urban development concept aiming at improving the quality of life of city dwellers by making the city more adaptive and efficient, using new technologies based on an object and service ecosystem. The scope of this new way of managing cities includes: public infrastructure (buildings, street furniture, home automation, etc.), networks (water, electricity, gas, telecoms); transport (public transport, intelligent roads and cars, carpooling, so-called soft mobility – by bike, on foot, etc.); e-services and e-administrations.
Smart charging	Smart charging is an umbrella term for all technologies aimed at optimising the charging or discharging of an electric vehicle through efficient, flexible and economical management of the vehicle's recharging power.
STEP	Pumped-storage hydropower plant. Power plant with two tanks, an upper and a lower one, connected by pumps that allow the water to be pumped up once turbined and located in the lower tank, towards the upper tank.
Storage	Storage consists in placing packages of radioactive waste in a facility, ensuring their long-term management, *i.e.*, under safe conditions allowing for long-term risk control.
Nuclear safety	Nuclear safety includes all of the technical, organisational and human measures which are intended to prevent accident risks and to limit the effects of an accident, and which are taken at every stage of the nuclear power plant lifecycle (from design to operation and finally to decommissioning).
Therms (th)	One therm (th) is equivalent to 1,163kWh or 4,186 million joules.
Nuclear tranche	Electrical generation unit consisting of a nuclear boiler and a turbo-alternator generator. A nuclear tranche essentially consists of its reactor type and the power of its turbo-alternator generator. EDF nuclear plants include two or four tranches, and occasionally six.
Uranium	In its natural state, uranium is a mix containing three main isotopes (elements whose atoms have the same number of electrons and protons, thus the same chemical properties, but a different number of neutrons): ● uranium 238, 99.3% fertile; ● uranium 235, 0.7% fissile; ● uranium 234. Uranium 235 is the only natural fissile isotope, a quality which justifies its use as an energy source.
Enriched uranium	Uranium, whose isotope 235 content, the only fissile material, has been increased from its low natural level (0.7%) to approximately 4% in order to be used as pressurised water reactor fuel.
ERU (enriched reprocessed uranium)	To be used in a reactor, reprocessed uranium (RepU), even if containing more fissile uranium than in its natural state, must be further enriched. It is therefore called enriched reprocessed uranium (ERU).
RepU (reprocessed uranium)	Reprocessed uranium ("RepU"), uranium derived from spent fuel reprocessing, differs from natural uranium as it contains slightly more uranium 235 and other uranium isotopes. It is recyclable and RepU fuel assembly refuelling is commonly used in reactors.
Vitrification	Process of immobilisation in a glass structure of concentrated solutions of high-level radioactive waste by mixing at high temperature with glass paste.
Non-interconnected zones	Zones in France which are not connected (by power lines) to metropolitan France (Corsica and overseas departments).

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