



# 2021 FACTS & FIGURES





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# BEFORE STARTING...

## THE MAIN FOCUS OF THESE FACTS & FIGURES

- **On the road to carbon neutrality:**
  - **CSR:** achievements, new targets & reduction of CO<sub>2</sub> emissions
  - French government supports in **nuclear Small Modular Reactors (SMR)** and **EPR2** reactors
  - **Nuclear power included in European Taxonomy**
  - New **Hydrogen Plan**
  - Growth and new targets for the **Electric Mobility Plan**
- **An overview of regulated activities** (Enedis, Linky, etc.)
- **Updates on renewable energies** (pipeline breakdown, etc.) **and growth prospects**

## Reading suggestions

### Did you know?

- To help you understand the terms used, you will find a **glossary** at the end of the document
- You will also find “**Did you know?**” takeaway boxes throughout the document that shed light on specific content
- Much more information is available in our URD, which you can download via:

<https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/financial-information/regulated-information/reference-documents>

## Browsing suggestions

- **Hypertext links** have been included to help you browse this document in tables of contents
- **Clicking on the EDF logo** (in the footer) will bring you back to the main table of contents (page 5)
- The name of the chapter can be found at the bottom of each page
- **Clicking on the title of the chapter** (in the footer) will bring you back to the beginning of this chapter







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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

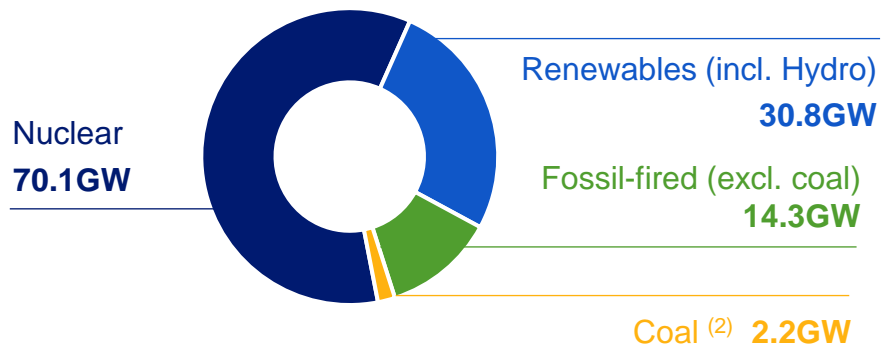
# THE EDF GROUP

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# EDF GROUP 2021 KEY FIGURES

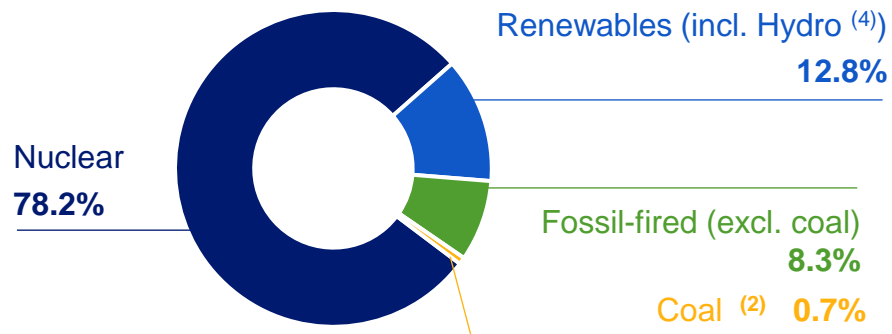
## Operational figures as of end 2021

- **38.5 million** customer sites
- **117.3GW<sup>(1)</sup>** installed capacity



- **523.7TWh** electricity output<sup>(3)</sup>

91%  
decarbonised  
generation<sup>(5)</sup>



- **167,157** employees  
o.w. 63,070 at EDF, 38,701 at Enedis, 16,551 at Framatome, 18,451 at Dalkia and 11,141 at EDF Energy

(1) Consolidated capacities of EDF group  
(2) Figures including the shutdown of the Le Havre coal power in April 2021  
(3) Output from fully consolidated entities  
(4) Hydro output including pumping

## 2021 Financials

- Sales: **€84.5bn**
- EBITDA: **€18.0bn**
- Net income excluding non-recurring items<sup>(6)</sup>: **€4.7bn**
- Net investments<sup>(7)</sup>: **€15.7bn**
- Net financial debt : **€43.0bn**  
Cash flow: **-€1.5bn**  
Net finance debt / EBITDA ratio : **2.39x**
- Ratings<sup>(8)</sup>: BBB negative (S&P) / Baa1 negative (Moody's) / BBB+ negative (Fitch)

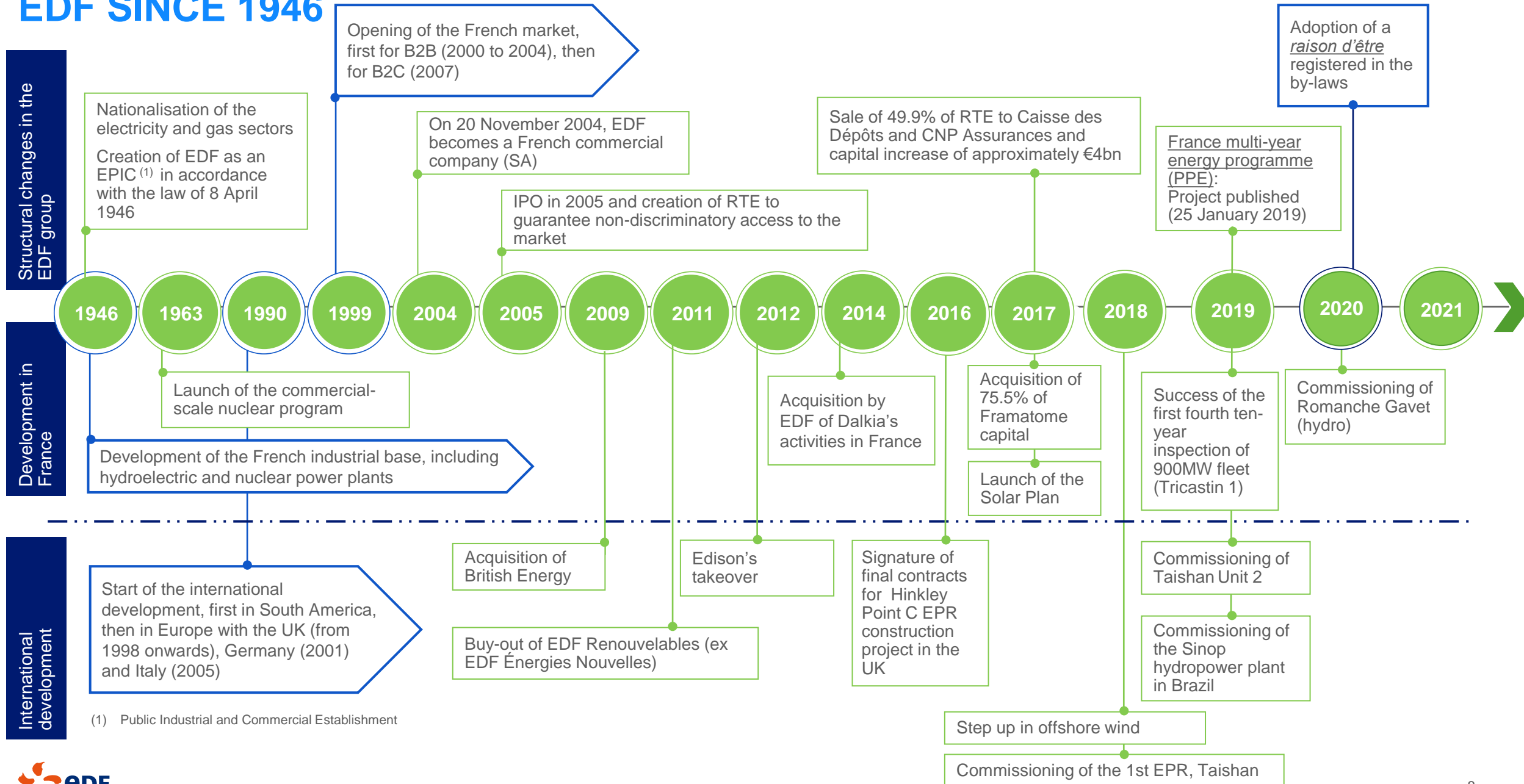
## 2021 CSR data

- **94%** of Group investments were in line with the Group's net-zero emissions trajectory
- **CO<sub>2</sub> emissions** : 48gCO<sub>2</sub>/kWh decreasing vs 2020 and 1<sup>st</sup> in the world ranking of 2020 producers<sup>(9)</sup> without direct CO<sub>2</sub> emissions
- **Gender equality** : 29.8 % of women in management committees

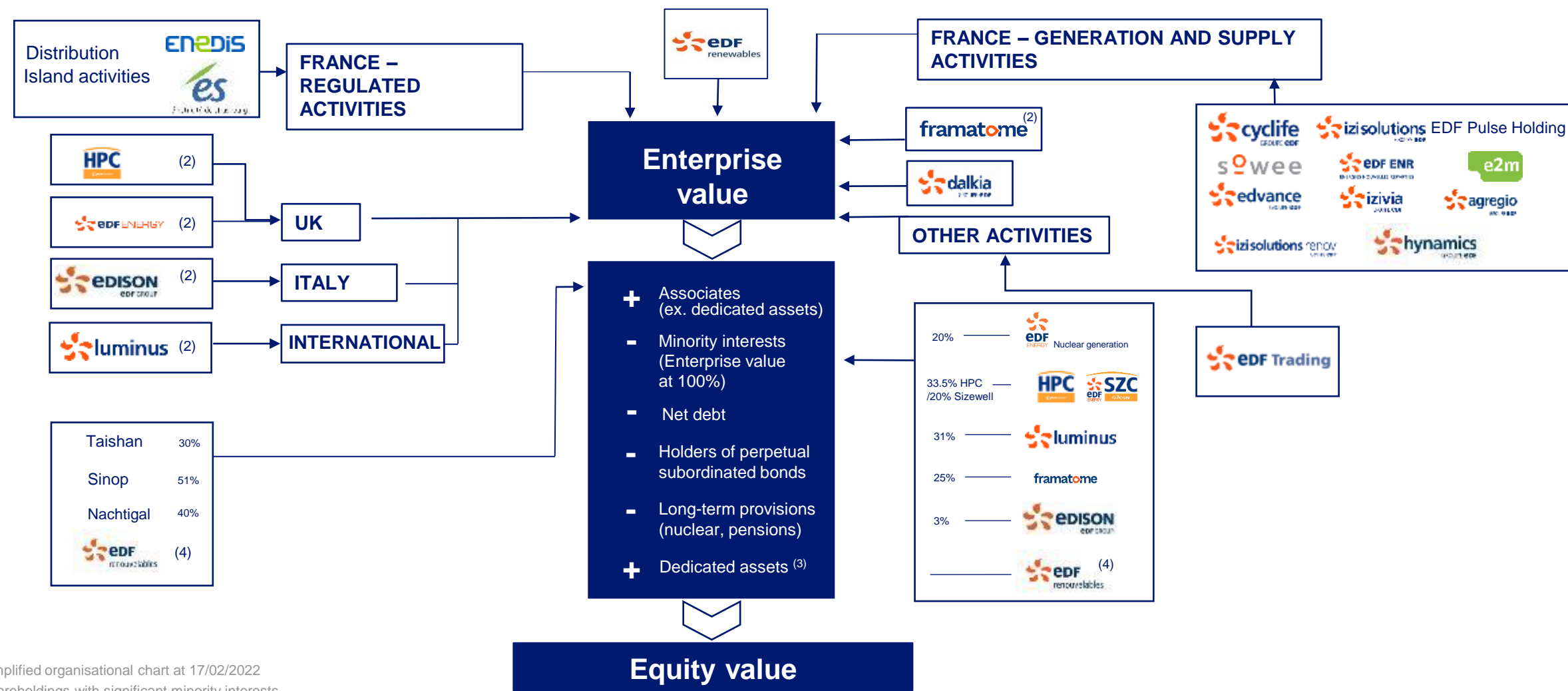
(5) Direct carbon emissions related to generation, excluding life cycle assessment (LCA) of production means and fuels  
(6) Net income excluding non-recurring items is not defined by IFRS standards, but it is visible in the note 19.1 of the consolidated financial statements.  
(7) Net total investments including acquisitions, excluding disposal plan  
(8) Sources: rating agencies as of 28/03/2022  
Enerdata Power Plant Tracker [www.enerdata.net](http://www.enerdata.net)



# EDF SINCE 1946



# EDF GROUP: ORGANISATIONAL CHART (1)



(1) Simplified organisational chart at 17/02/2022  
(2) Shareholdings with significant minority interests  
(3) See slide "Performance of EDF SA's dedicated assets" on p.235  
(4) Companies and shareholdings held at different levels by the EDF Renewables group

# 2030 - THREE STRATEGIC KEY PILLARS

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

A creator of services and solutions to support customers and regions in the shift towards carbon neutrality

As a key player in the decarbonisation of society, EDF creates value for its customers through the energy and innovative solutions it provides

A global leader in the generation of CO<sub>2</sub>-neutral electricity

EDF builds and operates electricity generation facilities that decarbonise the electricity mix and invests in innovative and competitive technologies

A key international player in the energy transition

EDF is deploying its expertise as a low-carbon energy company in new areas of growth and innovation, far from its historical borders



> 15mtCO<sub>2</sub> avoided emissions <sup>(1)</sup>

€10bn revenue in services <sup>(2)</sup>

> 1.5 contract/customer <sup>(3)</sup>



Decrease of 50% of direct carbon emissions vs 2017

x2 renewables capacities incl. Hydraulic vs 2015 so 60 GW nets

Continuing the operation of France's nuclear power plants beyond 40 years, by successfully completing the Grand Carénage

Initiating new EPR & 1 SMR



Exit coal

Triple the activity vs 2015 <sup>(4)</sup>

1.5 – 2GW nets hydro installed capacities <sup>(4)</sup>

↗ 1 million off-grid kits

(1) Customers, Services & Territories sector's activities. EDF estimate, including CO<sub>2</sub> savings linked mainly to heating and cooling networks, the development of the electric vehicle and energy saving certificates.

(2) Group

(3) EDF estimate on 4 priority countries in Europe called "G4" (France, Italy, UK and Belgium) (residential)

(4) Excluding "G4", i.e. the 4 priority countries in Europe, called « G4 »

(5) Flamanville 3, Hinkley Point C and Taishan



A creator of services and solutions to support customers and territories shifting towards carbon neutrality

Global leader in CO<sub>2</sub>-neutral electricity generation

An international player in the energy transition



**1.16 contracts/customer<sup>(1)</sup>**  
(2030 target > 1.5 contract/customer<sup>(1)</sup>)

**+20% Enedis connections** vs 2019<sup>(2)</sup>



**3,1 GW** gross renewable capacities commissioned (2030 target: x2 capacities incl. hydro vs 2015, i.e. 60GW net)

**91% decarbonised<sup>(3)</sup> generation<sup>(4)</sup>**  
(o/w 93% in the European Union)



**Achievements in the United Arab Emirates, in Cameroon and in Chile**

(2030 target: **Triple business activity** vs 2015<sup>(5)</sup>)



**3 strategic key pillars supported by an impulse of transformation, innovation, human ambition and by Corporate Social Responsibility commitments**

(1) Scope of France commercial division (CST).

(2) EDF estimate for the 4 core countries called "G4" in Europe (France, Italy, UK, Belgium) for residential customers.

(3) Collective housing, comparison vs 2019. 2020 was an exceptional year because of COVID.

(4) Direct generation-related CO<sub>2</sub> emissions, excluding life-cycle analysis (LCA) of fuel and production means.

(5) Electricity output of fully consolidated entities (excluding gas, coal and fuel oil).

(6) Outside the G4 countries, i.e. excluding the four core countries in Europe.

# BUSINESS MODEL (1/2)

## ASSETS AND RESOURCES - 2021

### Customer proximity

- **32.5** million customers in electricity and **6.0** million customers in gas<sup>(1)</sup>
- **Leading** brands : EDF, Edison, Luminus, Dalkia
- **74.3** million customer visits on digital consumption monitoring platforms<sup>(2)</sup>

### A human ambition

- **167,157** employees<sup>(3)</sup>
- **79%** of employees attended a skills development training during the year<sup>(3)</sup>



### An ambitious innovative ecosystem

- A new Innovation and Pulse Programmes department created in 2021
- Nearly **2,263** R&D employees<sup>(4)</sup>
- R&D consolidated budget of **€661m** in 2021
- **756** patented innovations at end-2021 by the R&D (EDF & Enedis)

### Major industrial assets

- **117.3GW** of electricity generation capacity<sup>(5)</sup>
- An integrated nuclear industry
- EPR technology
- A portfolio of wind and solar projects of almost **76GW**<sup>(3) (6)</sup>
- **1.4** million km of distribution network<sup>(7)</sup>
- **34** million smart meters installed<sup>(3)</sup>
- **Over 330** heating and cooling networks operated by Dalkia

### A strong CSR commitment

- **No. 1** investor in the energy transition in Europe
- **A** rating  **CDP** Climate Change
- **n°4**  **SUSTAINALYTICS**
- **€19bn** of green & sustainable funding at end-2021

(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) Pipeline excluding capacities under construction. All the projects in

prospection phase included in the pipeline, starting 2020

(7) Enedis distribution network under concession

## BUSINESS MODEL ...

**« 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*

**CAP2030**

**Three strategic axes for the decarbonisation of our companies in France, Europe and worldwide:**

**A creator of services and solutions to support customers and territories in the shift towards carbon neutrality**

**>15MtCO<sub>2</sub>**  
avoided emissions<sup>(1)</sup>

**€10bn revenues**  
in services<sup>(3)</sup>

**>1.5**  
contract / customer<sup>(2)</sup>

**A global leader in the generation of CO<sub>2</sub>-neutral electricity**

**↗50%**  
CO<sub>2</sub>eq direct emissions  
vs.2017

**60GW nets**  
>x2 new renewables  
capacities (incl. Hydro)  
vs.2015

Initiating new **EPRs**  
& **1 SMR**

**An international key player in the energy transition**

**Exit coal**

**1.5 – 2GW nets**  
hydro installed  
capacities<sup>(4)</sup>

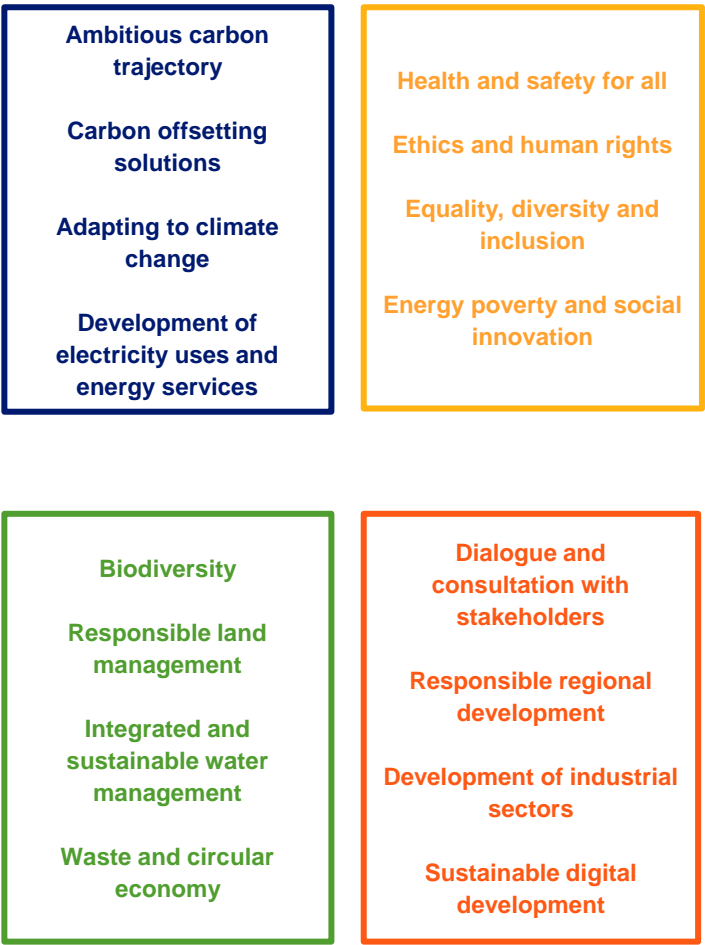
**1 million**  
off grid kits

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



Scope : (1) Activities of Customers & Services and territories department. EDF estimate, including CO<sub>2</sub> savings linked mainly to heating and cooling networks, the development of the electric vehicle and energy saving certificates. (2) EDF estimate on 4 priority countries in Europe called "G4" (France, Italy, UK and Belgium) (residential). (3) Group. (4) Excluding the 4 priority countries in Europe called "G4".

## The breakdown of CSR issues into 16 commitments



### For the climate and the environment

- An ambition to contribute to **carbon neutrality** by 2050
- Electricity output of **523.7TWh**, **91%** decarbonised <sup>(1)</sup> with emissions of **48gCO<sub>2</sub>/kWh** <sup>(2)</sup>
- EDF, a water sharing player: water intensity of **0.82l/kWh** <sup>(3)</sup>
- Commitment for biodiversity



### For customers

- High customer satisfaction level
- More than **642,000** vulnerable customers received energy assistance <sup>(4)</sup>

### For partners and territories

- SMEs account for between **22** and **26 %** of EDF and Enedis procurements
- **1** EDF SA direct job generates **4.4** jobs on the national territory <sup>(5)</sup>
- **100%** of projects are subject to consultation <sup>(6)</sup>

### For employees

- An employee engagement index of **69%** <sup>(7)</sup>
- Women represent **29.8%** in Management Committees <sup>(8)</sup>
- An average salary equity <sup>(9)</sup> of **6.6**

Sales: **€84.5bn**

EBITDA: **€18.0bn**

Net income excl. Non-recurring items: **€4.7bn**

Sharing added value with our stakeholders



#### Suppliers

Purchases <sup>(10)</sup>

**€52.9bn**

EDF group Global CSR Agreement



#### States and territories

Taxes <sup>(11)</sup>

**€4.7bn**



#### Employees

Remuneration <sup>(12)</sup>

**€14.5bn**



#### Shareholder dividends

Target distribution rate <sup>(13)</sup>

**45%-50%**

(1) Direct output-related CO<sub>2</sub> emissions, excluding life-cycle analysis (LCA) of fuel and generation means.  
(2) CO<sub>2</sub> emissions due to heat and electricity generation. Group scope.  
(3) Water consumed / total electrical generation of fleet. Group scope.  
(4) Scope EDF SA.  
(5) Goodwill study based on the 2020 consolidated figures.  
(6) More than €50m projects, in accordance with the Equator Principles – scope Group.  
(7) MyEDF Group internal survey.

(8) Scope Group.  
(9) EDF SA perimeter - 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 2021 net income excluding non-recurring items adjusted or the remuneration of hybrid bonds accounted for in equity.



## TARGETS <sup>(1)</sup>

**3GW gross of low-carbon electrolytic hydrogen projects developed by 2030 worldwide <sup>(1)</sup>**

**a European leader of 100% low-carbon hydrogen generation in 2030 <sup>(2)</sup>**  
from low-carbon network electricity, renewable energy or nuclear power

**Main markets addressed: Industry and transport (in territorial mobility and e-fuels for maritime and air transport)**

- (1) Subject to the implementation of appropriate support policies and a favourable regulatory framework for the development of electrolytic hydrogen
- (2) In line with the maximum emissions threshold defined in the European taxonomy, as part of its Hydrogen Plan, EDF is committed to ensuring that all its hydrogen production projects are below this threshold of  $3\text{kgCO}_{2\text{eq}}/\text{kgH}_2$
- (3) Eifer, joint research centre of EDF and the *Karlsruher Institut für Technologie* (KIT) in Germany
- (4) IPCEI : *Important Project of Common European Interest* ; LDAE : *Lignes Directrices Aides d'Etat* (State Aid Guidelines)

## ACHIEVEMENTS AND PROJECTS

### A dedicated subsidiary and expertise within the Group

- Hydynamics, a wholly-owned subsidiary of the EDF group dedicated to hydrogen since 2019
- Long-standing expertise provided by Eifer <sup>(3)</sup> and R&D, including an electrolyser test platform at the EDF Lab *Les Renardières* site
- A stake in the McPhy French electrolyser manufacturer since 2018 (14.1% to date)

### First facility commissioned in 2021 & projects

- Commissioning by Hydynamics of the largest French electrolytic hydrogen production and distribution site in Auxerre (1MW). About 15 other territorial mobility projects under development

### Major projects for the industry under development and which will benefit from public support (within the framework of the IPCEI or the LDAE <sup>(4)</sup>)

- The Hynovi project (330 MW of electrolysis) in partnership with the cement manufacturer Vicat in France to produce e-methanol,
- Also in France, the ABC Ottmarsheim project with Boréalys to decarbonise ammonia production and the HYDOM project with Domo Chemicals
- In Germany, notably the Westküste project (30 MW), which will continue with the Hyscale project (500 MW in phase 1)

### In total, a portfolio of some 60 projects representing 1GW of electrolysis worldwide

- Several projects in Italy (Brindisi, Porto Marghera, Dalmine...), in the United Kingdom (Teesside, Sizewell...) and in Belgium
- Ambitious projects combining hydrogen and renewables in other regions of the world, including the Middle East, North America and Latin America

# EDF ELECTRIC MOBILITY PLAN <sup>(1)</sup>



## TARGET

### 30% MARKET SHARE IN THE ELECTRICITY SUPPLY FOR ELECTRIC VEHICLE OWNERS IN 2023

In the Group's four main markets (G4): France, UK, Italy and Belgium

**400,000**

Charging stations rolled out by 2023

*Upgrade of +250,000 vs 2020 objectives*

**20,000**

Smart charging stations operated by 2023

*Upgrade of +10,000 vs 2020 objectives*

## ACHIEVEMENTS AND PROJECTS

**Support to EDF's customers and European partners in their shift towards e-mobility:**

IZIVIA: 500 charging stations already installed in the Lyon metropolitan area

**More than 200,000 charging stations installed and operated in the Group at end-2021**

IZIVIA, the leader in the operation of public charging points: 19.5% of this segment (charging points located in private car parks or in the street)

Pod Point:

- around 70,000 charging stations rolled out in the UK in 2021
- secured growth financing through a fund raising (minority IPO)

**+ 10,000 smart charging stations operated by Izivia in France and PowerFlex in California**

RIGE project (smart charging in the Grand Est region) on the installation of 500 V1G and V2G stations for companies and local authorities.

V2G: DREEV certification for RTE to supply remunerated system services to the network via electric vehicles

EVVE: Certification by the European Commission of the DREEV and EDF project among the winners of the Innovation Fund's call for small-scale projects. The subsidy will be used to install 800 V2G stations by end-2024.

**"EV100" project in line with the objective**

17.3% of the EDF group vehicle fleet electrified at end-2021, versus a target of 100% in 2030

(1) The EDF Electric Mobility Plan supplements specific investments made in this field by Enedis, an independent subsidiary of EDF according to the French Energy Code

# THE FRENCH SOLAR PLAN



## EDF'S DEVELOPMENT IN SOLAR PV IN FRANCE CONTINUES TO ACCELERATE

### TARGET

BE A LEADER IN FRANCE

30% MARKET SHARE <sup>(1)</sup> BY 2035

- (1) Market share expressed as installed gross capacities  
(2) Including Green Lighthouse Development pipeline acquired in 2021

### ACHIEVEMENTS AND PROJECTS



**c.5.5GW <sup>(2)</sup>**

of grounded-based projects in development at end-2021



**c.330MW**

of secured projects at end-2021



**c.350MW**

under construction at end-2021



**196 MW awarded** at CRE tender 4.9 and 4.10 :



**Acquisition of 45% stakes** in Green Lighthouse Development, French solar project developer, established in Nouvelle-Aquitaine



# THE ELECTRICITY STORAGE PLAN <sup>(1)</sup>

## TARGET

DEVELOP 10GW IN NEW STORAGE SITES WORLDWIDE  
BY 2035, IN ADDITION TO THE 5GW OPERATED TODAY <sup>(2)</sup>



## ACHIEVEMENTS AND PROJECTS

A PORTFOLIO OF COMPLETED OR SECURED PROJECTS HAVING INCREASED  
TO A TOTAL OF 1.1GW AT END-DECEMBER 2021

The results in 2021 benefited from the contribution of major large-scale projects:

Signature of the Desert Quartzite PPA (**California**): storage system (150MW/600MWh) coupled with a 300MW solar power plant

Launch of 2 new projects by Pivot Power (**UK**): 2 storage systems of 50MW/100MWh directly connected to the transport network (Coventry and Midlands projects)

Winner of the "risk mitigation" tender in **South Africa** for electricity supply: storage systems (75MW) coupled to wind and solar projects allowing to supply a dispatchable power

Signature of a ENR PPA with the city of Iquitos (**Peru**, 500,000 habitants, world biggest city not interconnected): 100MW PV + 100MW storage

Projects progressively commissioned in 2021:

+145MW of capacities commissioned in 2021 in France (Guadeloupe, Martinique), in the USA (Maverick 2), in the UK (Pivot Power: Cowley 50MW and Kemsley 50MW) and in Germany (installation of a 1.6MWh storage system at the customer Speira Hamburg)

(1) The EDF group's business development model is based on partnerships. Not all of these projects will necessarily be fully consolidated

(2) Principally PSHP (Pumped-Storage Hydropower Plants)

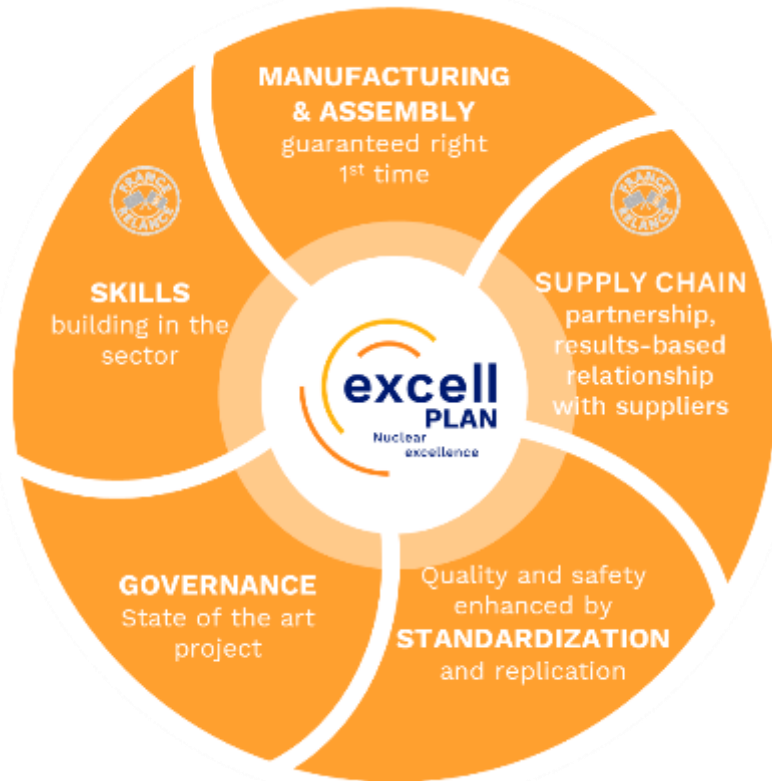
# THE EXCELL PLAN

## Aiming for excellence in the French nuclear industry



Announced at the end of 2019 and launched in May 2020, excell plan aims to enable the French nuclear industry to regain the highest level of rigour, quality and excellence in order to meet the needs of existing and future major nuclear projects

In 2021, EDF Group and the industry implemented 25 commitments, structured in 5 axes



### ACHIEVEMENTS 2021

- **Governance of new nuclear projects strengthened** by the introduction of « Contrôle des Grands Projets » (CGP, December 2020): each project undertaken is subject to a quarterly review based on a standard milestone
- Creation in April 2021 of « **Université des Métiers du Nucléaire** » (UMN) to boost training offers.
- Creation of the **Cotentin-Normandy High School for Welding Training** (Hefaïs), in partnership with Orano, Naval Group and CMN (Constructions Mécaniques de Normandie).
- Definition in close collaboration with industry of **12 standards to produce compliant products « right first time »** and to establish a collaborative and balanced relationship between EDF and its suppliers.
- **44 companies are implementing "excell in quality" plans**

Excell plan is now entering its third phase: consolidating the results achieved and making the actions undertaken sustainable in order to reach the best industrial standards.



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# 1 RAISON D'ÊTRE, 4 PILLARS, 16 CSR COMMITMENTS<sup>(1)</sup>

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

## CARBON NEUTRALITY & CLIMATE

- Ambitious carbon trajectory
- Carbon offset solutions
- Adapting to climate change
- Developing electricity use and energy services



CARBON  
NEUTRALITY  
& CLIMATE



WELLBEING  
&  
SOLIDARITY

## WELLBEING & SOLIDARITY

- Health and safety for all
- Ethics, compliance and human rights
- Equality, diversity and inclusion
- Energy precariousness and social innovation

## PLANET'S RESOURCES PRESERVATION

- Biodiversity
- Responsible land management
- Integrated and sustainable water management
- Waste and circular economy

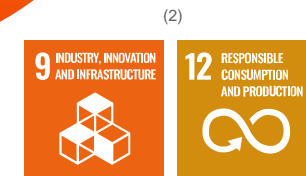


PLANET'S  
RESOURCES  
PRESERVATION

RESPONSIBLE  
DEVELOPMENT

## RESPONSIBLE DEVELOPMENT

- Dialogue and consultation with stakeholders
- Responsible regional development
- Development of industrial sectors
- Sustainable and inclusive digitalisation



RSE

(1) EDF's Raison d'être, approved by the Shareholders' Meeting of 07/05/2020.

(2) Priority SDG's as defined in WBCSD public report: An SDD Roadmap for Electric Utilities".

# 16 KPIs FOR MEASURING THE 16 CSR COMMITMENTS



	CSR COMMITMENTS	KEY PERFORMANCE INDICATORS	TARGETS	2019	2020	2021	DEAD-LINE	SCOPE
Carbon neutrality & climate	<b>Ambitious carbon trajectory</b>	Carbon intensity : specific CO <sub>2</sub> emissions from electrical generation and heat	<b>35gCO<sub>2</sub>/kWh</b>	55	51	<b>48</b>	<b>2030</b>	Group
	<b>Carbon offset solutions</b>	<i>Deployment rate of the framework guidelines on carbon offset solutions</i>	<b>100%</b>	-	-	<b>50</b>	<b>2023</b>	Group
	<b>Adapting to climate change</b>	<i>Deployment rate of new climate change adaptation plans within concerned entities</i>	<b>100%</b>	-	-	<b>47</b>	<b>2022</b>	Group
	<b>Development of electricity and energy services</b>	<i>Avoided CO<sub>2</sub> emissions thanks to our sales of innovative goods and services</i>	<b>&gt;15Mt</b>	-	-	<b>4.4</b>	<b>2030</b>	EDF & Dalkia
Planet resources preservation	<b>Biodiversity</b>	Achievement rate of "Act4nature international" commitments	<b>100%</b>	-	44	<b>67</b>	<b>2022</b>	Group
	<b>Responsible land management</b>	<i>Implementation rate of innovative solutions encouraging multifunctional land use</i>	<b>100%</b>	-	-	<b>20</b>	<b>2026</b>	Group
	<b>Integrated and sustainable water management</b>	Water intensity : water consumed / electricity generated by fleet	<b>&lt;0.95l/kWh</b>	0.87	0.87	<b>0.86</b>	<b>Annual</b>	Group
	<b>Waste and circular economy</b>	Annual rate of conventional waste directed towards a waste recovery industry	<b>&gt;90%</b>	92.4	91.9	<b>92.7</b>	<b>Annual</b>	Group
Wellbeing & solidarity	<b>Health and safety for all</b>	Global LTIR	<b>&lt;1.8Ind</b>	2.4	1.9	<b>2.1</b>	<b>2023</b>	Group
	<b>Ethics, compliance and human rights</b>	Proportion of executives who have completed the anti-corruption training programme	<b>100%</b>	61.8	62.5	<b>71.8</b>	<b>2021</b>	Group
	<b>Equality, diversity and inclusion</b>	Gender balance index : percentage of women in the Management Committee of the Group's entities	<b>33%</b>	27.3	28.7	<b>29.8</b>	<b>2026</b>	Group
	<b>Energy poverty and social innovation</b>	Individual guidance provided every year to our clients as part of the "Energy Support" framework	<b>600,000 – 1,000,000</b>	894,260	905,017	<b>642,482</b>	<b>Annual</b>	EDF
Responsible development	<b>Dialogue and consultation with stakeholders</b>	Annual rate of projects for which a dialogue and consultation procedure is engaged <sup>(1)</sup>	<b>100%</b>	-	-	<b>100</b>	<b>Annual</b>	Group
	<b>Responsible regional development</b>	Annual rate of procurement from SMEs in France	<b>22% to 26%</b>	22.5	23.4	<b>24.9</b>	<b>Annual</b>	EDF & Enedis
	<b>Development of industrial sectors</b>	<i>Achievement rate of supporting actions backed by EDF, encouraging relocation and maintaining nuclear industry skills ("France Relance" Programme)</i>	<b>100%</b>	-	-	<b>28.6</b>	<b>2023</b>	EDF
	<b>Sustainable and inclusive digitalization</b>	<i>Achievement rate of EDF's commitment to the French Responsible Digitalization Institute (INR)</i>	<b>100%</b>	-	-	<b>18.8</b>	<b>2024</b>	EDF

(1) New calculation methodology  
In italic: new KPIs for the new commitments

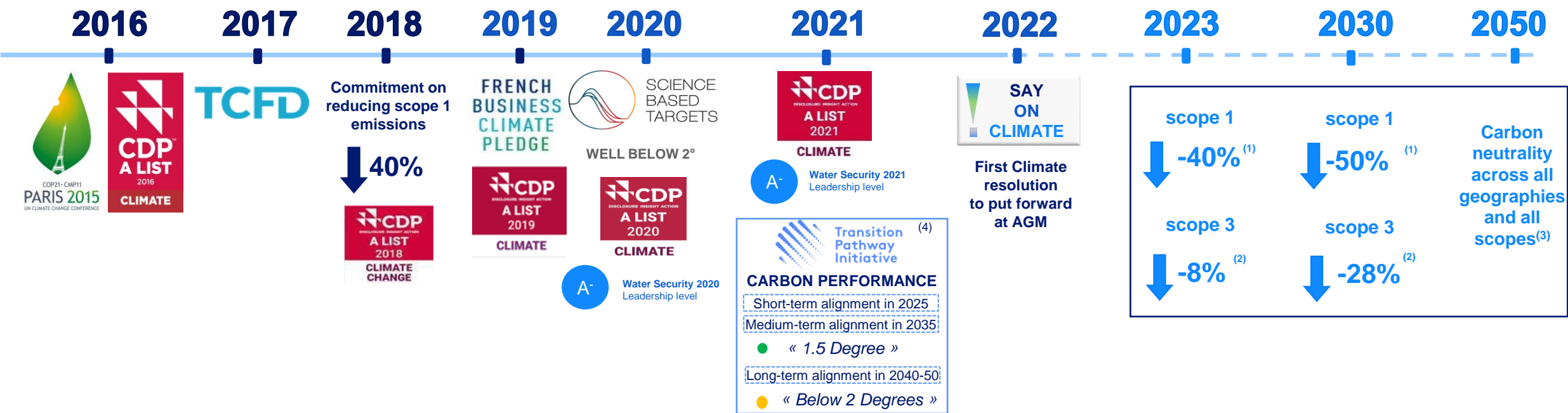


# EDF, A COMPANY COMMITTED TO PROTECTING THE CLIMATE



Ever since the Paris Agreement, EDF has been constantly strengthening its actions and responsibility on climate issues. The Group is committed to reducing its direct and indirect emissions, fostering its climate governance and maintaining its CDP Climate leader position.

## OUR CARBON NEUTRALITY PATHWAY

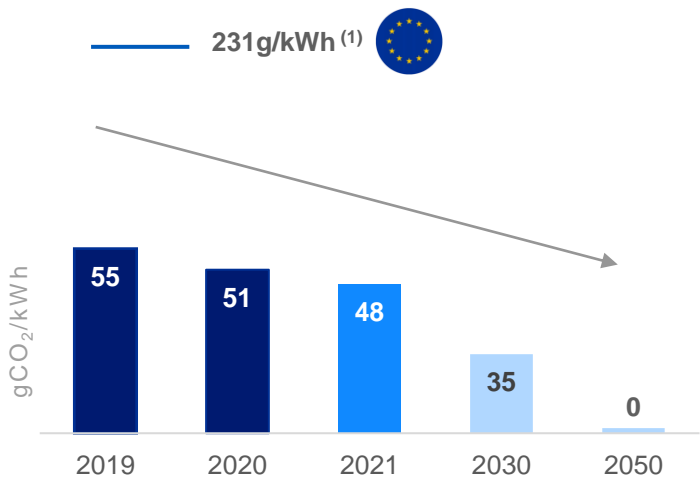


(1) Vs 2017  
 (2) Vs 2019  
 (3) Meaning : bring direct emissions close to zero (Scope 1), reduce indirect emissions as much as possible (Scope3), compensate residual emissions through negative-emission projects (3 scopes)  
 (4) <https://www.transitionpathwayinitiative.org/companies/edf>



## CARBON INTENSITY

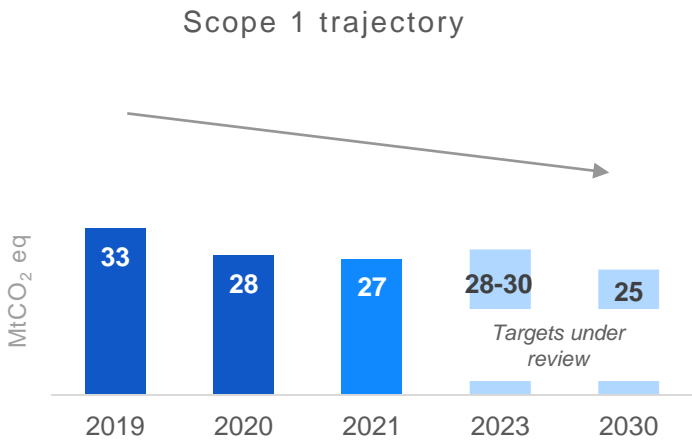
STEADILY DECLINING AND  
AROUND 5x LOWER THAN THE  
EUROPEAN AVERAGE



(1) 2020 carbon intensity average of power producers in Europe according to the European Environment Agency (EEA).

## CARBON TRAJECTORY

2023 TARGET ACHIEVED  
TWO YEARS IN ADVANCE



NB: Carbon intensity corresponds to the CSR commitment KPI which assesses the “ambitious carbon trajectory”.  
The gender equality index is assessed using the KPI to measure EDF’s CSR commitment to Equality, Diversity and Inclusion.  
These two KPIs are verified by an independent third-party organisation in 2021.

# CLIMATE REPORTING IN ACCORDANCE WITH TCFD GUIDELINES



The EDF Group was **one of the first companies** in the world to commit to supporting the TCFD<sup>(1)</sup> initiative in 2017 and to report publicly, from 2018, on the impact of climate change on its organisation according to the 4 fundamentals of TCFD and identified in its Statement on Non-Financial Performance since 2018



## REPORTING 2021

### 1 STRENGTHENING OF CLIMATE GOVERNANCE

- The « climate » criterion, based on carbon intensity, was extended to the variable remuneration of all directors in the Group
- A « Climate Fresk » sequence was organised with the members of the Board

### 2 CARBON PRICES FOR GUIDING INVESTMENTS

In line with the 2021 CDP, the carbon price range currently used by EDF for its scenarios is 47 to 150 €/t CO<sub>2</sub> by 2040, with a median price of 87 €/t CO<sub>2</sub>.

### 3 RISK MANAGEMENT

Validation by the Executive Committee and operational deployment of new adaptation plans to the physical risks of climate change, in all concerned entities

### 4 AN AMBITIOUS CARBON INTENSITY TRAJECTORY <sup>(3)</sup>

(1) The Task Force on Climate Change Disclosure (TCFD), set up by the Financial Stability Board (FSB), made specific recommendations between 2015 and 2017 on the climate reporting elements expected in companies' universal registration documents  
(2) 2020 estimation, EU-27, European Environment Agency, Greenhouse gas emission intensity of electricity generation by country, Oct. 2021  
(3) See p. 23 [Environmental & social Achievements and targets](#), carbon intensity category

# OTHER ENVIRONMENTAL AND SOCIETAL COMMITMENTS & INITIATIVES



Taskforce on  
Nature-related  
Financial  
Disclosures

In 2021, EDF joined the TNFD Forum, aiming at showing its support of the work done by the Taskforce, offering its operational experience and Group skills, and taking part of new projects.

Based on the TCFD model, the TNFD sets an ambitious ambition : setting up a reporting system allowing financial institutions and companies to integrate risks and opportunities linked to nature in their strategic planning decisions and to identify performance indicators.

## GENDER EQUALITY AMBITION

After achieving its 2020 objectives 2 years before the target-year, EDF has set itself more ambitious targets in 2021, applied to all hierarchical levels.

% Group female employment	2021	2026 target	2030 ambition
All employees	25,9	33	36-40
Managers	28,9	33	36-40
Members of Management Committees	29,8	33	36-40





## SUSTAINABLE FINANCING

**ISSUE OF A €1.85bn GREEN BOND**

**ISSUE OF A €1.25bn SOCIAL HYBRID BOND<sup>(1)</sup>**  
First benchmark issue  
of its kind in the sector

**72% OF CREDIT LINES INDEXED ON ESG KPIs**  
i.e. a total of €9.3bn<sup>(2)</sup>

(1) Funds dedicated to the financing of eligible projects  
corresponding to investment expenditures with SMEs.

(2) Over a total of €13bn at 31/12/2021.

## DECARBONISED GENERATION

**91% DECARBONISED<sup>(1)</sup> GENERATION<sup>(2)</sup>**  
**IN THE WORLD**  
(o/w 93% in the European Union)

(1) Direct output-related CO<sub>2</sub> emissions, excluding life-cycle analysis  
(LCA) of fuel and production means.

(2) Electricity production of fully consolidated entities.



# MODALITIES FOR INCLUSION OF NUCLEAR POWER IN EUROPEAN TAXONOMY



## EUROPEAN LEGAL PROCESS

- **1st delegated act** adopted by the Commission in June 2021 <sup>(1)</sup> to **define activities** providing a substantial contribution to climate goals
- **Complementary delegated act** published on 2 February 2022, including **nuclear and gas** as transition activities <sup>(2)</sup>
- **Delegated act on reporting** effective from 1 January 2022: disclosure of eligible activities share on 3 indicators **Revenue, Opex, Capex** as defined by the Taxonomy

(1) Delegated act published on 10 December 2021 in the Official Journal of the European Union

(2) Following a review period by the the French Parliament and Council of up to 6 months, the delegated act will be adopted in the absence of a veto for entry into force on 01/01/2023

## MODALITIES FOR INCLUSION OF NUCLEAR POWER IN EUROPEAN TAXONOMY <sup>(1)</sup>

- Construction and operation of **new reactors** with innovative technology (construction permit obtained before 2045)
- **Modifications aimed at extending the lifetime** of plants authorised before 2040
- **R&D** activities, demonstration and implementation of innovative reactors

*For nuclear projects located in the EU.*

*Compliant with “Do not significantly harm” criteria on the management of fuel, waste and security.*

(1) According to the complementary delegated act adopted on 02/02/2022 and applicable from 01/01/2023



# NON-FINANCIAL RATINGS



MAINTENANCE IN THE MAJOR  
NON-FINANCIAL INDEXES:  
(Non-exhaustive list)



— Sector average  
↓↑ Change vs. 2020 if ± 3 bps



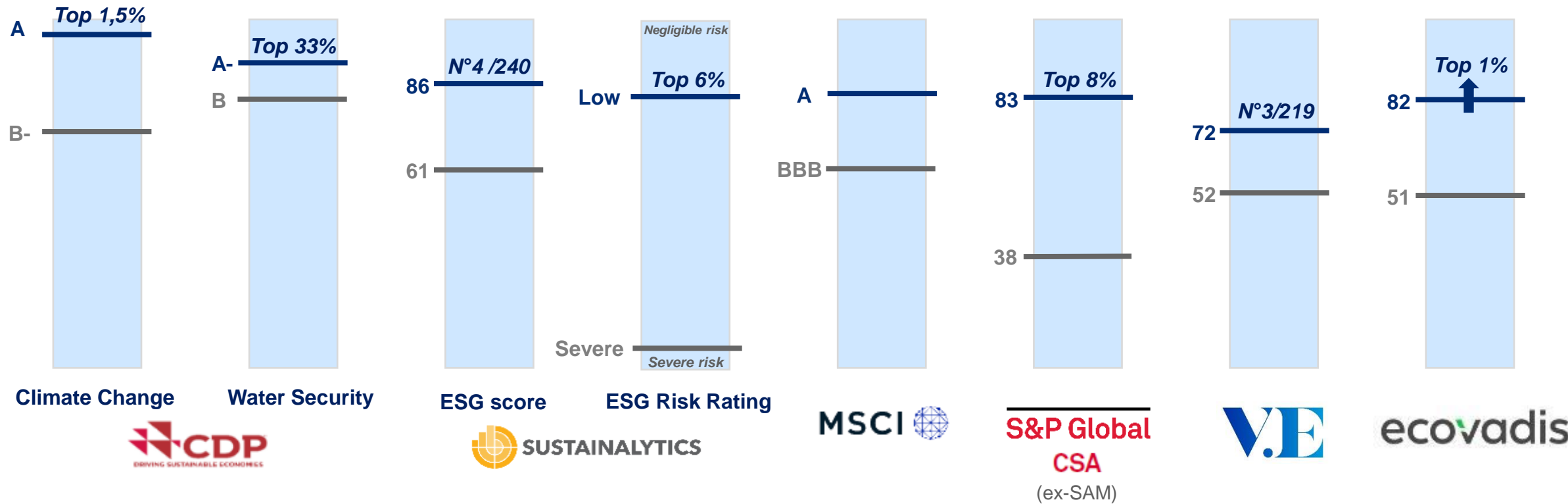
- Climate Change
- ESG Screened
- ESG Universal
- World Climate Change
- Climate Paris Aligned
- EU Low Carbon Leaders



- CAC40 ESG
- Vigeo World 120
- Eurozone 120
- Vigeo France 20

Others

- STOXX Global ESG Leaders
- FTSE4Good



## MAIN INTERNATIONAL COALITIONS OF EDF



2021 FACTS & FIGURES



BUSINESS AMBITION FOR 1.5°C OUR ONLY FUTURE



WE MEAN BUSINESS economic opportunity through bold climate action



# 2021 CSR KEY MILESTONES & AWARDS



## Impact report

July, EDF published « **Impact 2021** », a non-financial reporting that measures the externalities of EDF's activities and their contributions to the 9 most material SDGs for utilities.

## Just Transition ranking



October, EDF is **ranked first among 50 other utilities** on social criteria and ranked second on criteria linked to just transition by the **World Benchmarking Alliance**.

## Just Transition report

Ahead of the COP26, EDF publishes in November its **Just Transition principles**, « From strategy to actions ».

## COP 26

At **COP26** in November, EDF presents its views on nuclear energy to achieve carbon neutrality, employee involvement in the fight against climate change, the role of electricity to decarbonize the building and transport sectors.

## C&B Trophy « sustainable employee savings plan »

EDF is awarded the C& «Sustainable Employee Savings Plan» trophy, issued by the club, for its « **EDF solidary and low carbon**» fund, which is fully included in our targets to fight against climate change and to promote a just transition, as planned in the Paris Agreement



## Carbon footprint prize

EDF is chosen by Boursorama and 18- to 29-year-old shareholders for **having the best plan to reduce its carbon footprint**



## Impact award

EDF is awarded the Impact Award by Option Finance for the **first hybrid social bonds ever issued**



## Students' and young graduates' favorite company

EDF is twice in a row nominated as the students' and young graduates' favorite company in the utilities sector, according to EPOKA's barometer and Harris Interactive





# EDF'S GREEN BOND FRAMEWORK FOLLOWS BEST MARKET PRACTICES AND GREEN BOND PRINCIPLES (GBP)



**First company** to issue a Green Bond **in 2013**

**Active member** of the **GBP** governance

**Co-founder** of the **Corporate Forum on Sustainable Finance**

**2 updates of the Green Bond Framework** in order to contribute to better market practices

## 1 - USE OF FUNDS

- **Development of new renewable generation capacities**
- **Renovation and modernisation of existing hydroelectric assets** with the aim of improving their efficiency, flexibility and ability to contribute to meeting the needs of electricity systems (that evolve as the share of intermittent means of generation increases in the energy mix) and adapting the existing hydropower assets to climate changes
- **Energy efficiency solutions** to enable all EDF customers to make better use of energy, mainly through its subsidiary Dalkia
- **Biodiversity**, to enable EDF to continue to pursue its goal of having a positive impact on biodiversity, from simple prevention measures to measurable improvements

## 4 – REPORTING

- **At half-yearly intervals**: allocation of funds
- **Annually**: allocation of funds + list of projects financed by the Green Bond and aggregated impacts (at the level of each green issue)

## 2 - PROJECT SELECTION PROCESS

- A **internal organisation** dedicated to evaluating and ensuring that **only Eligible Projects** as defined in the Use of Funds section are eligible to receive **Green Bond financing**
- **Respect of specific environmental and social criteria**
- Investments may include:
  - **tangible or intangible assets**
  - **Investments** (including acquisitions mainly related to new developments / technologies)
  - **some operating expenditures** such as R&D and investments in the maintenance of green assets

## 3 - FUND MANAGEMENT

- Funds are **managed and monitored separately** until they are allocated to eligible projects
- They are invested in **Socially Responsible Investments funds** until their allocation

## 5 – EXTERNAL REVIEW

- **External ex-ante opinion**: “**reasonable**” level of assurance delivered by **Vigeo Eiris** on EDF's Green Bond Framework (their highest level),
- **Ex-post certification**: annual report issued by an **external auditor, Deloitte** on the allocation of funds and the compliance of Green Bond issues with the Green Bond Framework and the GBP, and the conformity of the CO<sub>2</sub> emissions determination modality

# GREEN BONDS: FUNDS ALLOCATION AND CO<sub>2</sub> EMISSIONS AVOIDED



Issue date	Funds raised	Funds allocated	Projects financed by the Green Bond	Share of the total investments financed by the Green Bond	Total net <sup>(1)</sup> capacity of the projects financed (in MW)	Expected net <sup>(1)</sup> CO <sub>2</sub> emissions avoided (in Mt/yr)
Nov. 2013	1.4Md€	1.4Md€	EDF Renewables projects	59%	976	1.55
Oct. 2015	1.25Md\$	1.25Md\$	EDF Renewables projects	58%	815	1.83
Oct. 2016	1.75Md€	1,248M€	EDF Renewables projects	54%	962	1.61
		502M€	EDF Hydro operations	100% <sup>(2)</sup>	903	0.01
Jan. 2017	26,000M¥	14,021M¥	wind projects (EDF Renewables, Luminus)	15%	86	0.12
		11,979M¥	EDF Hydro operations + hydro Luminus project	87%	133	0.01
Sept. 2020	2.4Md€	2,246M€	projects + portfolio purchases by EDF Renewables, EDF ENR projects, Luminus projects	77%	1,421	1.35
		138M€	EDF Hydro operations and biodiversity projects	100%	123	0.001
Nov. 2021	1.85Md€	-				
Total					5,410	6.48

The detailed list of EDF Renewables projects and hydraulic investment operations by category is published in the 2021 EDF URD document. Situation at end-2021

(1) Sum of the impacts of each project weighted by the share of total investment funded by the corresponding Green Bond

(2) Share of investments funded by EDF taken in full, including half of Romanche-Gavet investment amount

# EDF'S SOCIAL BOND FRAMEWORK FOLLOWS BEST MARKET PRACTICES AND SOCIAL BOND PRINCIPLES (SBP)



## 1 - USE OF PROCEEDS

- Eligible Projects include any **capital expenditure contracted with a SME<sup>(1)</sup>** which contributes to the development or maintenance of EDF group's power generation and/or distribution assets in Europe (defined as the European Union and the United Kingdom)
- **The social objective** of such projects is to **support the SMEs** that make up a key part of EDF's industrial fabric and which **provide employment opportunities in the territories where EDF is active**
- **Target population:** employees and subcontractors of SMEs
- No double counting: EDF will not finance projects already financed by any of its green bonds

## 4 – REPORTING

- For each Social Bond issuance, EDF will **report annually on the allocation and impact of the proceeds**, until full allocation or the maturity date of the relevant bond, whichever comes first
- An independent auditor will be appointed to issue an **annual assurance report** on fund allocations, compliance with the SBP and compliance of the methods used by EDF to estimate the social impact with the methodology described in the Framework

(1) 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 Large Enterprise or by an MMC.

## 2 - PROJECT SELECTION & EVALUATION PROCESS

- Eligible Projects are subject to a specific assessment and selection process:
- Under the coordination of EDF Group's Finance Division, **each Finance Department within a relevant EDF Division or subsidiary is responsible for identifying proposed Eligible Projects** that comply with the Use of Proceeds criteria
  - Each EDF division or subsidiary commits **to respect the policies and procedures of the EDF Group**, including those related to ethical procurement and contracting with SMEs
  - Each relevant EDF Finance department will **document the project assessment process** within their scope

## 3 - FUND MANAGEMENT

- Net proceeds are managed through a **dedicated process that ensures traceability until their allocation** to Eligible Projects
- Until full allocation, the balance of the unallocated net proceeds will be invested in short-term financial assets, labelled as "Socially Responsible Investments", as certified by French Ministry of Finance's Label ISR

## 5 – EXTERNAL REVIEW

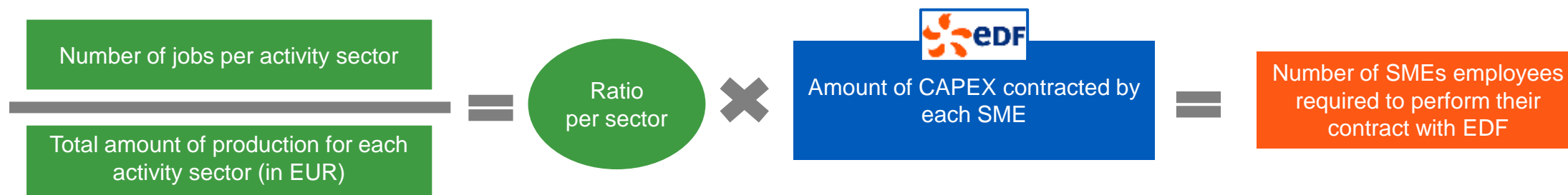
- **External ex-ante opinion:** "reasonable" level of assurance delivered by **S&P Global Rating** on EDF's Social Bond Framework
- **Ex-post certification:** annual report issued by an **external auditor**, KPMG, on the allocation funds and the compliance with Social Bond Framework and the SBP, and the conformity of the social impacts of financed projects at the portfolio level

# SOCIAL BOND – 2021 REPORT PREVIEW



- EDF is committed to the Social Bonds Principles recommendation to “seek to achieve positive social outcomes especially but not exclusively for a target population(s)”.
- EDF shall allocate proceeds from its May 2021 Social Bond issuance only to CAPEX spent with **SMEs located in zones with high unemployment challenges**, i.e., SMEs located in employment zones where the unemployment rate:
  - is higher than the average national unemployment rate; or
  - decreases less rapidly (or increases more rapidly) than the average national unemployment rate over the last five years

## Impact reporting: calculation of full-time employees per SME



## Key results: preview

	Amount spent <sup>(1)</sup>	Number of SMEs	Number of employees required <sup>(2)</sup>
2019	€550 million	1,324	3,330
2020	€589 million	1,411	3,531
2021 <sup>(3)</sup>	€111 million	690	653

(1) Amount spent in France by France – generation and supply and France – regulated activities

(2) Number of employees required to perform their contract with EDF calculated through the ratio number of employees / amount of production by activity

(3) Funds only spent at Q1



# THE EDF GROUP

- **GROUP STRATEGY** **P. 6**
- **CORPORATE RESPONSIBILITY – CSR** **P. 19**
- **HIGHLIGHTS** **P. 34**
- **INNOVATION & TRANSFORMATION** **P. 45**
- **GOVERNANCE** **P. 51**

# NUCLEAR POWER: MAJOR CONTRIBUTION TO DECARBONISED GENERATION



## ANNOUNCEMENTS BY THE FRENCH PRESIDENT TO SUPPORT THE NUCLEAR SECTOR

- Launch of a construction program of 6 EPR2 reactors with potentially 8 more
- Extended operations for all reactors except for safety issues
- Launch of French SMRs including €500m for NUWARD™

## NEW NUCLEAR MAJOR PROJECTS

### FLAMANVILLE 3

- Update** of fuel loading target from end-2022 to Q2 2023 and construction costs from €12.4bn to €12.7bn<sup>(1)</sup>



### SIZEWELL C

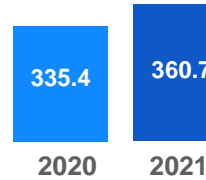
- Draft law introduced by the UK government on a **funding** scheme (Regulated Asset Base) of new nuclear projects



## EXISTING NUCLEAR

### FRANCE

Generation  
(in TWh)



**“Grand Carénage”**: Five 4th 10-year inspections completed, 2 under way

Signature of an exclusive agreement to acquire part of the GE Steam Power’s nuclear activities<sup>(2)</sup>

**Extension** of 1,300MW nuclear fleet depreciation period to 50 years

### UNITED KINGDOM

Generation  
(in TWh)



**Closure** of Dungeness B and Hunterston B power plants<sup>(3)</sup>

## NUCLEAR POWER INCLUDED IN EUROPEAN TAXONOMY<sup>(4)</sup>

(1) See 12 January 2022 press release. Cost in 2015 euros and excluding interim interests.

(2) See 10 February 2022 press release. Excluding the American continent.

(3) Closures in June 2021 and January 2022, respectively. Decision to close Hinkley Point B in mid-2022.

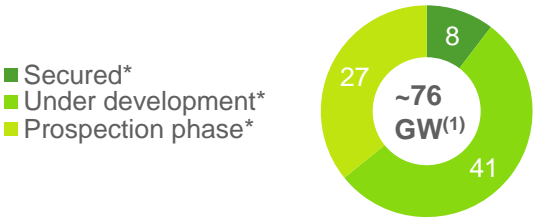
(4) Complementary delegated act of 02/02/2022 subject to definitive adoption in 2022.

# RENEWABLES: CONFIRMATION OF GROWTH TREND



## STRONG GROWTH IN PROJECT PIPELINE...

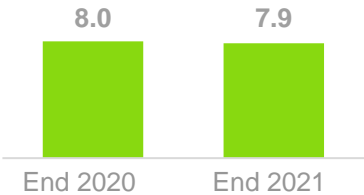
to 76GW gross, +27 % vs end-2020



Highlight: winner of a 1.5GW offshore wind farm in the **USA**

## ...ENABLING A HIGH LEVEL OF CONSTRUCTION STARTS...

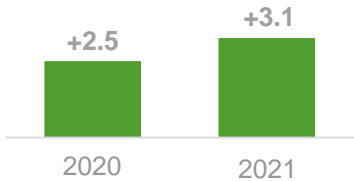
Capacity under construction at end of year<sup>(1)</sup> (gross GW)



Highlight: launch of the construction of a 300MW solar plant in **Saudi Arabia**

## ...ACCELERATION IN COMMISSIONING...

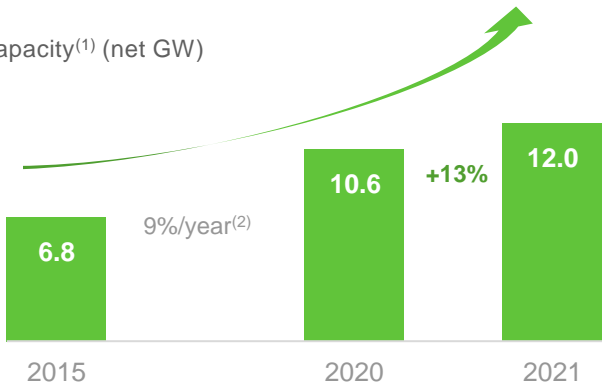
Capacity commissioned<sup>(1)</sup> (gross GW)



Highlight: commissioning of a 200MW offshore wind farm in **China**

## ...AND STRONG GROWTH IN NET INSTALLED CAPACITY

Installed capacity<sup>(1)</sup> (net GW)



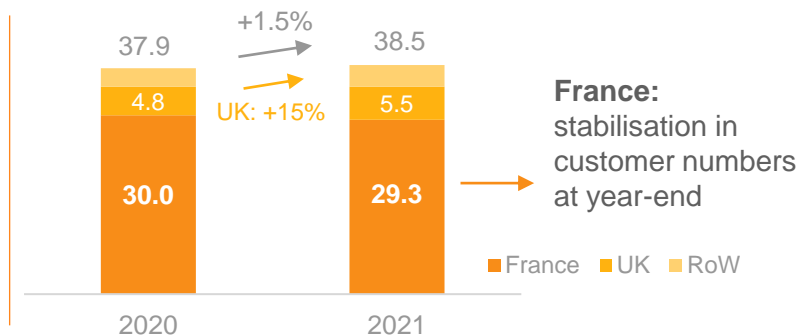
(1) Wind and solar. See Book supplementing the presentation, p.31 and following.

(2) CAGR: Compound annual growth rate.

# CUSTOMERS: COMMERCIAL OFFERS WELL POSITIONED



## CONSOLIDATION OF CUSTOMER PORTFOLIO WORLDWIDE <sup>(1)</sup>



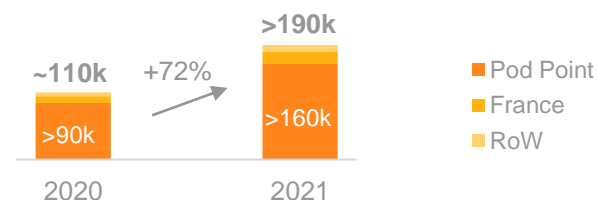
## GOOD PERFORMANCE ON OFFERS

- **Market offers** among the best positioned in Q4 2021 <sup>(2)</sup>
  - **Customers in market offers** <sup>(3)</sup>  
(in millions)
- 
- | Year            | Customers (in millions) |
|-----------------|-------------------------|
| 2019            | 0,2                     |
| 2020            | 1                       |
| 2021            | 1,4                     |
| 2023 (estimate) | 3                       |
- Increase in **number of contracts/customer** <sup>(4)</sup> for services, gas and electricity: 1.16 contract/customer end-2021 (2030 target > 1.5)

## STRONG GROWTH IN DECARBONISED OFFERS

### ELECTRIC MOBILITY

Close to 200,000 **Group charging points** installed and managed at end-December 2021



**Pod Point**, leader in residential charging in the UK

**Izivia**, leader in on-street charging in France

### SERVICES

**Dalkia Electrotechnics/Citelum**: winner of a 10-year public street lighting contract for the **city of Paris**

**Dalkia**: contracts won in operations & maintenance heating and cooling networks (biomass and biogas) in France

(1) Millions of residential and professional (electricity and gas) customers, calculated by delivery point. A customer may have two delivery points. For France: DCO, ÉS and SEI.

(2) Electricity and gas market offers in terms of price for residential customers in France.

(3) Residential electricity customers in France.

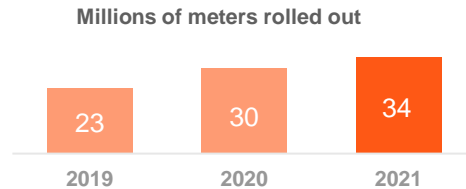
(4) EDF estimate: France, UK, Italy and Belgium (residential).

# ENEDIS: THE WORLD'S SMARTEST POWER GRID <sup>(1)</sup> CONTRIBUTING TO THE TERRITORIES' ECOLOGICAL TRANSITION



## LINKY SMART METERS: SUCCESSFUL ROLL-OUT

Target met on meters rolled out by 31/12/2021 in France:



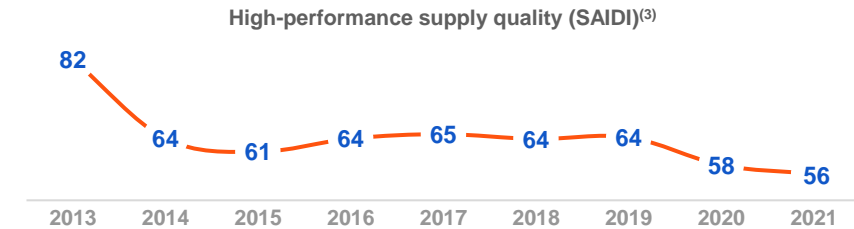
Industrial success in terms of time and performance with final project costs lower than the initial budget

Linky remuneration<sup>(2)</sup>: additional 3% bonus expected

## THE SMARTEST GRID IN THE WORLD

Enedis **ranked No.1** in Singapore Smart Grid Index<sup>(1)</sup> out of 80 operators worldwide

## FIRST-RATE OPERATIONAL PERFORMANCE



## STRONG GROWTH IN CONNECTIONS

Connection volumes up 20% compared with 2019 in all segments, including:

- **Renewables:** +3.6GW in RE connected to the distribution grid in 2021 (+104%). More than 500,000 photovoltaic installations connected<sup>(4)</sup>
- **Electric mobility:** +190% connections between 2021 and 2020

(1) According to the Singapore Smart Grid Index which measures how smart networks are (57 countries).

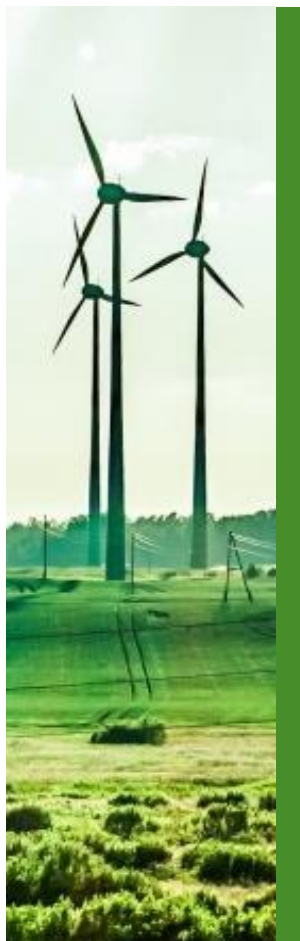
(2) 7.25% + 3% bonus (depending on costs, deadlines and the system performance in the roll-out phase).

(3) Excluding exceptional events and transmission network incidents.

(4) 90% of installed wind and photovoltaic capacity is connected to the distribution grid.



# ITALY: SUCCESSFUL STRATEGIC REPOSITIONING OF EDISON



## DEVELOPMENT OF A RENEWABLE PLATFORM

**Reorganisation of the renewable assets** of Edison in Italy within a new platform: acquisition of the remaining stake in the E2i holding company, and entry of a financial partner<sup>(1)</sup>

**Target of 4GW of installed capacity<sup>(2)</sup> by 2030** (1.1GW at end-2021, +9% vs 2020)

No. 2 in the wind power market in Italy

## FOCUS ON CORE BUSINESSES

Finalised disposal of the **E&P business<sup>(3)</sup>**

Disposal of **Infrastrutture Distribuzione Gas (IDG)**

## NEW DEVELOPMENTS

### SUPPLY

**Customer growth** (+4.3%<sup>(4)</sup> vs 2020)

Increase in **value added services** (boilers, air conditioners, electric mobility charging points, etc.)

Growth in **contracts/customer** to more than 1.4

### ENERGY EFFICIENCY SERVICES

Solutions to support industrial customers and public administrations to maximise their energy efficiency and reduce their environmental impact

### HYDROGEN

Partnerships for the construction of H<sub>2</sub> production plants on industrial sites<sup>(5)</sup>

(1) Edison retains control over the new platform.  
(2) Gross capacities in wind and solar.  
(3) Exploration and Production activities, except in Algeria.

(4) Number of B2B and B2C customers (delivery points).  
(5) Among others: Alboran (220 MW in Puglia), Dalmine (140 MW in Lombardy), Deus (45 MW in Sicily).

# INTERNATIONAL: SUCCESS IN ENERGY TRANSITION PROJECTS AND PROGRESS IN HYDROPOWER



## SUCCESS IN ENERGY TRANSITION PROJECTS

### PROJECT FINANCING SECURED

Financing finalised (\$1bn non-recourse) for an **innovative solar and gas project** based on a 480MW solar plant in **Chile**

### ELECTRICITY TRANSMISSION

Contract won in the **UAE**, in a consortium, to develop and operate, a 3.2GW underwater transmission system<sup>(1)</sup> over a 35-year operating period

## PROGRESS ON HYDROPOWER PROJECTS

### POWERPLANT CONSTRUCTION PROJECTS

**Construction of Nachtigal** (420MW) in Cameroon: **More than half of** the civil engineering and electro-mechanical work completed. Industrial commissioning planned for 2024

**Mpatamanga project** (350 MW) in Malawi: consortium including EDF selected as preferred bidder

### ASSISTANCE TO PSHP<sup>(2)</sup> PROJECT MANAGEMENT

**Hatta** (250MW) in the UAE: 35% progress rate on construction supervised by EDF

(1) Direct-current high voltage transmission system.

(2) Pumped storage hydropower plants.

# DISPOSAL AND COST SAVINGS PLANS COMPLETED ONE YEAR AHEAD OF SCHEDULE



**DISPOSALS:** €3.7bn ACHIEVED AT END-2021  
VS TARGET OF ~ €3bn BETWEEN 2020 AND 2022<sup>(1)</sup>

REFOCUSING  
ON CORE BUSINESS /  
DISPOSAL OF CARBON-  
INTENSE ACTIVITIES

- E&P<sup>(2)</sup> business and gas distribution network (IDG) at Edison
- Waste treatment: Dalkia Wastenergy
- Gas plant in the UK<sup>(3)</sup>

ACCELERATED  
DEVELOPMENT

- Edison renewables: entry of a financial partner<sup>(4)</sup>
- Electric mobility: Pod Point IPO<sup>(5)</sup>

REAL ESTATE ASSETS

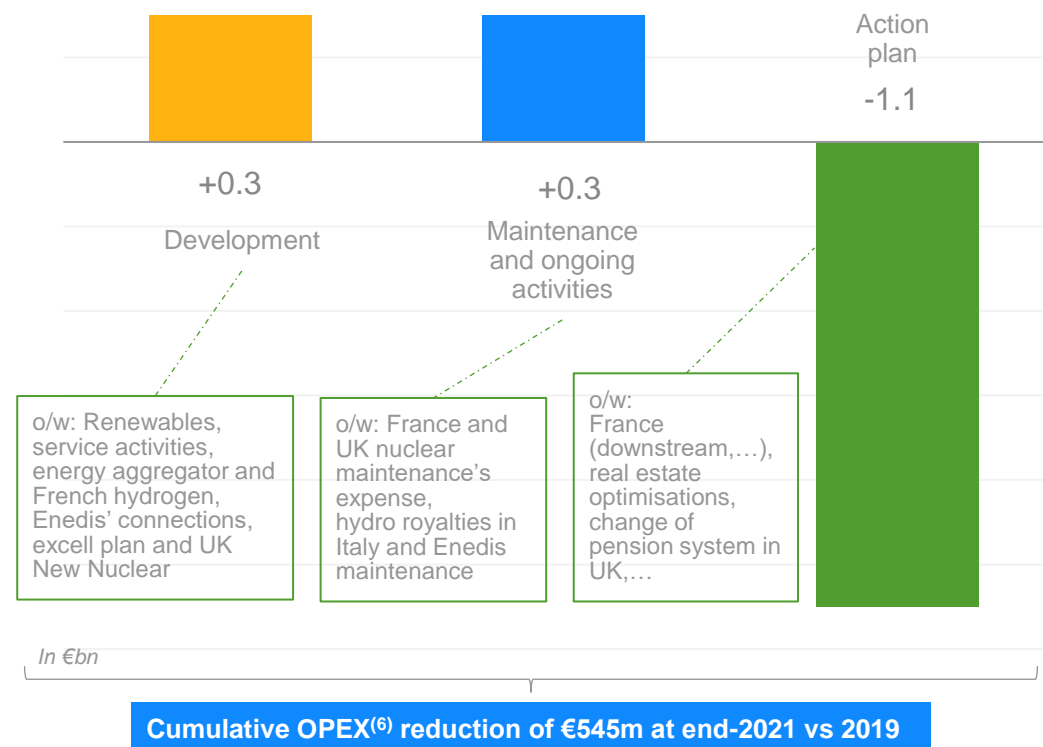
- Property assets in France

COMPANIES NOT  
CONTROLLED

- 49.99% share in US nuclear power stations (CENG)



**OPERATING EXPENSES:** CUMULATIVE REDUCTION OF €545m  
AT END-2021 VS TARGET OF €500m BETWEEN 2019 AND 2022<sup>(6)</sup>



(1) Signed or completed disposals: impact on the Group's economic debt reduction (S&P definition). The impact on net financial debt was around €3bn.

(2) Exploration and Production activities, except in Algeria.

(3) West Burton B.

(4) Edison retains control over the new platform.

(5) Minority IPO 25%. EDF remains the majority shareholder.

(6) Sum of personnel expenses and other external expenses. At constant scope, standards, exchange rates and pension discount rates and excluding inflation. Excluding costs of sales of energy service activities and of nuclear engineering services of Framatome and of specific projects such as Jaitapur.

# 2022 - A CHALLENGING YEAR

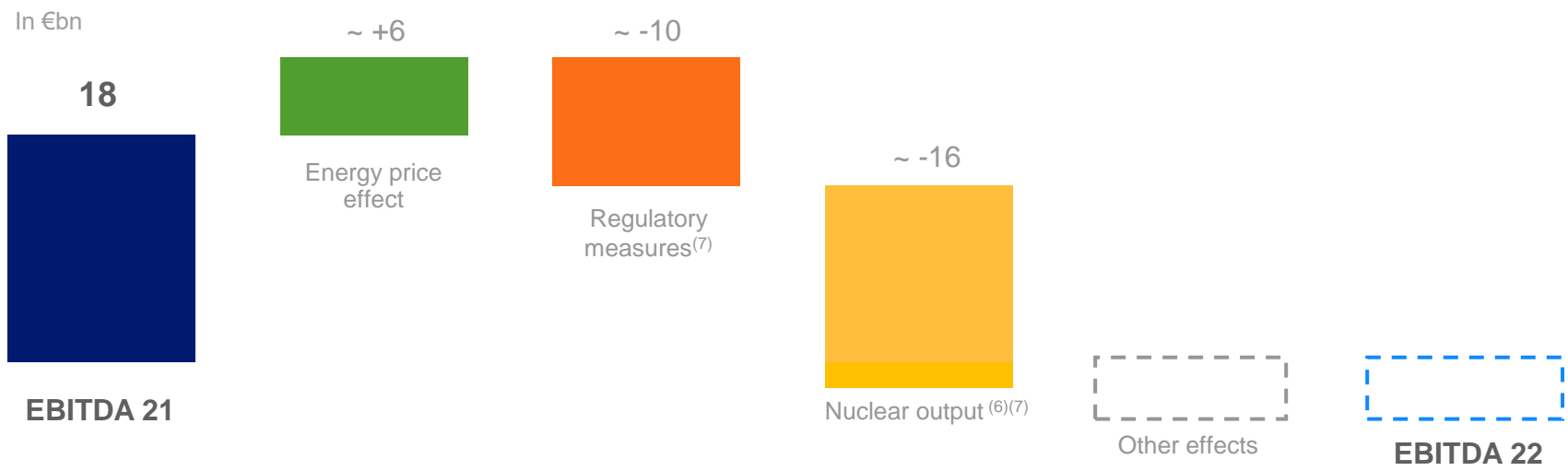


## EXCEPTIONAL MEASURES LIMITING PRICE INCREASE IN 2022 <sup>(1)</sup>

Additional allocation of 20TWh of ARENH<sup>(2)</sup> volumes for 2022  
12-month postponement to February 2023 of part of the tariff increase relative to 2022<sup>(3)</sup>

## OUTAGES OR EXTENSION OF OUTAGES OF NUCLEAR REACTORS

Owing to the detection of defaults on the pipes of the safety injection system<sup>(4)</sup>  
French nuclear output estimate updated to 295-315TWh for 2022 and to 300-330TWh for 2023<sup>(5)</sup>



(1) See 13 January 2022 press release.  
(2) ARENH: Regulated access to historic nuclear power. Attribution of an additional 20TWh for the period from 1 April 2022 to 31 December 2022 at €46.2/MWh.  
(3) For residential regulated tariffs customers and “blue professionals” and for all professionals located in the non-interconnected zones (ZNIs).

(4) See 13 January, 7 February and 11 February press releases.  
(5) Versus previously 330-360TWh for 2022 and 340-370TWh for 2023.  
(6) Estimated figures depending on market prices and other effects.  
(7) See 14 March 2022 press release..

# ACTION PLAN TO SUPPORT GROWTH STRATEGY

## BALANCE SHEET STRENGTHENING

- **Rights issue:** €3.16 billion<sup>(1)</sup>. The French State has indicated its intention to subscribe to its share of EDF's capital
- **Scrip dividend**
  - EDF will offer the option to receive a scrip dividend<sup>(2)</sup> for fiscal years 2022 and 2023
  - The French State has indicated its intention to opt for the scrip dividend for both years
- Additional **disposals** of ~€3 billion<sup>(3)</sup> over 2022-2024

(1) With preferential subscription rights guaranteed, Including issue premium and based on, for illustrative purpose, a reference price of 8€ per share and a discount in line with market practices.  
See press releases on 18 March 2022 and on 5 April 2022.

(2) Target payout ratio of net income excluding non-recurring items (adjusted for the remuneration of hybrid bonds accounted for in equity) for 2022 and 2023 of 45-50%.

(3) Signed or completed disposals: impact on the Group's economic debt reduction (S&P definition).



# SHARE CAPITAL INCREASE WITH PSR <sup>(1)</sup>: MAIN CHARACTERISTICS & OPERATION'S RESULTS

## Key features of the EDF Rights Issues

Amount	€3,1bn (498 millions of new shares)
Subscription party	2 new shares for 13 existing shares
Subscription price	€6.35 per new share
Discount	25.5% of the theoretical ex-rights price at the close the 16 March 2022

## Operation's results

Total demand Rate subscription	€4,1bn 129%
Total market demand Rate subscription	€1,4bn 280%

Thus the State holds **83.88 %** of share capital (3,134,481,623 shares) and **88.76%** of right votes  
vs 83.88% of share capital and 89.18% of right votes before the operation

## Subscription on an irreducible basis

Right exercised	3,208m
Subscribed shares	494m i.e. €3,134m
Granted shares	494m i.e. €3,134m
Rate subscription	99.07%

## Subscription on an reducible basis

Requested shares	149 M i.e. €947m
Granted shares	4.6 M i.e. €30m
Rate subscription	0.93%

(1) PSR = Preferential Subscription Rights

# THE EDF GROUP

- **GROUP STRATEGY** **P. 6**
- **CORPORATE RESPONSIBILITY - CSR** **P. 19**
- **HIGHLIGHTS** **P. 34**
- **INNOVATION & TRANSFORMATION** **P. 45**
- **GOVERNANCE** **P. 51**

# CAP 2030 INNOVATION: EDF PULSE, INCUBATOR OF INTERNAL PROJECTS AND INVESTMENTS IN START-UPS (1/2)

## MISSION

CREATE COMPETITIVE NEW OFFERS AND INNOVATIVE SERVICES FOR OUR CUSTOMERS  
CONSISTENT WITH THE GROUP'S *RAISON D'ÊTRE*

### DRIVERS



#### INVESTOR

in external start-ups  
or joint ventures



#### PARTNER

of mainstream and multi-sector funds  
(Eurazeo, EIP, Supernova, DBL,  
CleanH<sub>2</sub>...)



#### INCUBATOR

Intrapreneurship programme for Group  
employees, including subsidiaries

### RESOURCES

**Over €270m**

invested since its creation in 2017

**20**

strategic venture capital funds  
partners

**Over 25**

start-up collaborations and creations

# CAP 2030 INNOVATION: EDF PULSE, INCUBATOR OF INTERNAL PROJECTS AND INVESTMENTS IN START-UPS (2/2)

INVESTMENTS BETWEEN SEPTEMBER 2017 AND DECEMBER 2021

## SUSTAINABLE TERRITORIES



## PRODUCTION-TOOL PERFORMANCE



## SERVICES FOR RESIDENTS



## DECENTRALISED ENERGY SYSTEMS



# CAP 2030: AN IMPULSE OF TRANSFORMATION FOR THE EDF GROUP

*Building an effective and empowering work environment that fosters engagement and meets the new expectations of customers, employees and all stakeholders*

## CAP 2030, a transformation programme



Transformation of **operational business lines**



Transformation of **support subsidiaries**



**Innovation**



**Management** practices and **Leadership ambition**



**Digital** technologies and **uses**

## Efficiency and performance

**Simplify organisation systems**

**Challenge practices**

**Empower the teams**

## Selected achievements and initiatives in 2021

- Deployment of the **excell plan**
- Obtaining “**Responsible digital**” certification
- Renewal of “**Responsible suppliers and purchases**” certification
- A new Innovation and Pulse Programmes department created
- Signature of a collective agreement entitled “Work Differently, Manage Differently”
- Implementation of simpler and more digital processes
  - Generalised roll-out of electronic signatures
  - Large-scale implementation of collaborative tools
  - Data, **AI**, **Blockchain**, etc.
  - Automation of repetitive tasks



# R&D: INNOVATE TODAY AND VENTURE INTO TOMORROW

Through the expertise of its researchers, its testing resources and digital capacity, EDF R&D is preparing the future and opening up new possibilities in the world of energy.

**EDF's R&D covers all the business areas and activities in the energy sector.**

In line with EDF group's *raison d'être* and cap 2030 strategy, its research focuses on three main priorities:

- Electricity transition
- Climate transition
- Digital and societal transition

- R&D mobilises its energy experts for the benefit of the EDF group entities and subsidiaries, as well as external customers.

It relies on more than **70 platforms for testing**, measurement and simulation, among **the most modern and effective in the world**, in all areas of the energy sector.

- R&D also provides its customers with expertise in large-scale **digital simulation software and supercomputers**.

EDF's R&D has a computing capacity of 11 petaFLOPS, making it one of the largest players in this field.



## EDF SA'S R&D IN 2021

- **2,263 employees** worldwide (EDF SA)
- **160 PhD** students
- **9 research centres:**
  - 3 in France
  - 6 internationally (Germany, United Kingdom, China, United States, Singapore and Italy)
- **20 joint laboratories** with partners
- **+ 300 academic and industrial partnerships** around the world
- **756 patented innovations** protected by 2,158 property titles in France and abroad
- **€487 million budget** in 2021 (EDF SA)
- **99%** of R&D operating budgets in France dedicated to decarbonation and energy system transition

## R&D PRESENT ON ALL CONTINENTS

Three research centres in France and six internationally, as well as an office in Brussels.

Based in regions home to a wealth of innovative technologies and business models, EDF's international research centres manage or support key Group projects on microgrids, hydrogen, offshore wind, and mobility.

# R&D INNOVATES TO PREPARE FOR THE FUTURE

## THE CONTRIBUTION OF R&D TO SOME MAJOR ACHIEVEMENTS OF THE EDF GROUP



### ➤ OFFSHORE WIND POWER

R&D supports EDF Renewables on fostering the development of the floating offshore wind power sector. In particular, it brings its know how in modelling.



### ➤ AGRI PV

An innovation that responds to the challenges of the solar power plan: cohabitation between traditional agricultural activity and a photovoltaic installation



### ➤ LITE DERMS

An affordable and scalable microgrid management solution to accelerate electricity access worldwide



### ➤ EPIFLEX

This approach, underway at Dunkerque, enables the design of ecological industrial parks that enhance regional energy-material flows through the implementation of exchange networks and innovative technologies



### ➤ CHARGING STATIONS

R&D contributes to the reliability and durability of the charging stations rolled out by Group entities (IZI, IZIVIA, DREEV) by testing and qualifying the equipment



### ➤ INTERACTIVE IMMERSIVE PLANT

R&D provides the nuclear fleet with a virtual-reality simulator to train field agents



### ➤ SMR

R&D pursues its research work on the NUWARD SMR, co-developed by the technological consortium including EDF, the CEA, Technicatome and Naval Group. It is working to support the Nuclear New Build Department on simplifying the architecture and integration of passive safety systems.



### ➤ STORAGE

The R&D centre is fully committed in EDF's storage plan. It is in particular reviewing battery life, performance and recycling



### ➤ RESPONSE

A European H2020 project by the EDF Group, overseen by EIFER and aimed at promoting "positive-energy neighbourhoods", with Dijon as the pilot city in France

# THE EDF GROUP

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# BOARD OF DIRECTORS OF EDF

## CHARACTERISTICS OF THE BOARD OF DIRECTORS' COMPOSITION

- 18 directors, of which 11 directors appointed by the General Shareholders et 6 directors elected by the employees
- In 2021, 14 meetings et attendance rate of 95.2%
- 41.7% independent qualified directors <sup>(5)</sup>
- 50.0% of women sitting on the Board <sup>(5)</sup>
- Skills and expertise in line with the diversity policy which was adopted by the Board, updated in 2021
- Staggered renewal of the directors (4-year term of office, renewed by half every 3 years)

## DIRECTORS APPOINTED AT THE GENERAL SHAREHOLDERS' MEETING

- |   |   |
|---|---|
| • Jean-Bernard LÉVY, CEO <sup>(2)</sup>   | the French State <sup>(3)</sup>   |
| • Nathalie COLLIN <sup>(3)</sup>  | • Colette LEWINER <sup>(3)</sup>  |
| • Bruno CREMEL <sup>(2)</sup>   | • Marie Christine LEPETIT, appointed on recommendation of the French State <sup>(3)</sup> |
| • François DELATTRE, appointed on recommendation of the French State <sup>(3)</sup> | • Claire PEDINI <sup>(2)</sup>  |
| • Gilles DENOYEL, appointed on recommendation of the French State <sup>(2)</sup>    | • Philippe PETITCOLIN <sup>(2)</sup>  |
| • Delphine GENY-STEPHANN, appointed on recommendation of                            | • Michèle ROUSSEAU, nommée sur proposition de l'État <sup>(3)=</sup>                      |

## DIRECTOR REPRESENTING THE FRENCH STATE

- Martin VIAL <sup>(4)</sup>

## DIRECTORS ELECTED BY THE EMPLOYEES

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| • Claire BORDENAVE <sup>(5)</sup> | • Jean-Paul RIGNAC <sup>(5)</sup> |
| • Karine GRANGER <sup>(5)</sup>   | • Vincent RODET <sup>(5)</sup>    |
| • Sandrine LHENRY <sup>(5)</sup>  | • Christian TAXIL <sup>(5)</sup>  |

<sup>(1)</sup> Excluding directors representing the employees (corporate governance AFEP- MEDEF Code ).

<sup>(2)</sup> Term of office expiring at the end of the General Meeting called to approve the financial statements for 2022

<sup>(3)</sup> Term of office expiring at the end of the General Meeting called to approve the financial statements for 2024

<sup>(4)</sup> Term of office expiring on 20 November 2022.

<sup>(5)</sup> Term of office expiring on le 22 November 2023

# BOARD OF DIRECTORS COMMITTEES

## AUDIT COMMITTEE

- 8 members, of which 4 director representing the employees
- 75 % of independent directors <sup>(1)</sup>
- 6 meetings in 2021
- Attendance rate of 97.9% in 2021

## NUCLEAR COMMITMENTS MONITORING COMMITTEE

- 6 members, of which 3 director representing the employees
- 3 meetings in 2021
- Attendance rate of 100 % in 2021

## STRATEGY COMMITTEE

- 8 members, of which 4 director representing the employees<sup>(2)</sup>
- 3 meetings in 2021
- Attendance rate of 100 % in 2021

## APPOINTMENT, COMPENSATION AND GOVERNANCE COMMITTEE

- 8 members, of which 1 director representing the employees
- 66.67% of independent directors <sup>(3)</sup>
- 5 meetings in 2021
- Attendance rate of 95 % in 2021

## CORPORATE RESPONSIBILITY COMMITTEE

- 6 members, of which 3 director representing the employees
- 4 meetings in 2021
- Attendance rate of 77.5% in 2021
- The Chair of the Committee is the Climate Referent of the Board of Directors

<sup>(1)</sup> Excluding directors representing the employees (corporate governance AFEP- MEDEF Code ).

<sup>(2)</sup> Directors who are not members of the Strategy Committee may attend its meetings

<sup>(3)</sup> Excluding directors representing the employees (corporate governance AFEP- MEDEF Code ).



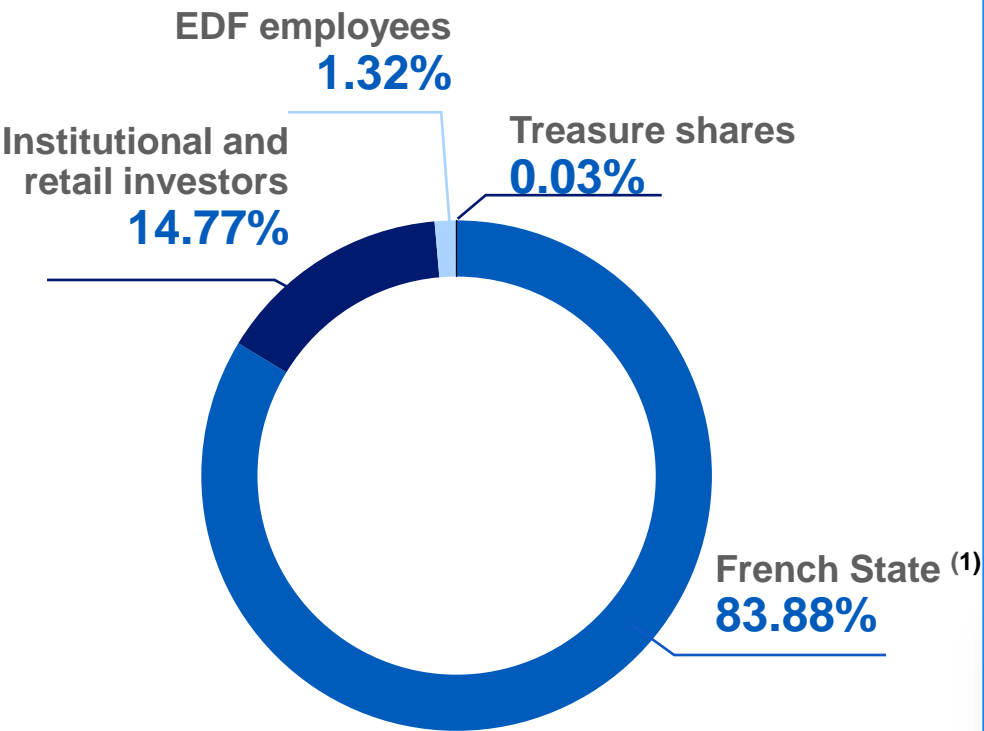
# EDF GROUP EXECUTIVE COMMITTEE

- **Jean-Bernard LÉVY** Chairman and Chief Executive Officer (CEO)
- **Marc BENAYOUN** Group Senior Executive Vice President in charge of Customers, Services and Territories. He also oversees Edison and the Group's gas business
- **Bruno BENSASSON** Group Senior Executive Vice President in charge of Renewable Energies, chief Executive Office of EDF Renewables.
- **Béatrice BUFFON** Group Senior Executive Vice President in charge of the International Division
- **Christophe CARVAL** Group Senior Executive Vice President in charge of Group Human Resources
- **Xavier GIRRE** Group Senior Executive Vice President in charge of Group Finance
- **Véronique LACOUR** Group Senior Executive Vice President in charge of Change Management and Operational Efficiency
- **Cédric LEWANDOWSKI** Group Senior Executive Vice President in charge of Nuclear and Thermal business
- **Alexandre PERRA Group** Senior Executive Vice President in charge of Innovation, Corporate Social Responsibility and Strategy
- **Simone ROSSI** Group Senior Executive Vice President, CEO of EDF Energy
- **Pierre TODOROV** Group Senior Executive Vice President and Group General Secretary
- **Alain TRANZER**, General Representative for Industrial Quality and Nuclear Skills
- **Xavier URSAT** Group Senior Executive Vice President in charge of Engineering and New Nuclear Projects

**Paul-Marie DUBEE** Senior Executive Vice President in charge of Executive Coordination and Government Relations, is also discharging clerical duties for the Executive Committee

# EDF: SHAREHOLDING STRUCTURE AS OF 31/12/2020

## SHARE CAPITAL AS OF 31/12/2021



**By law, the French State must hold at least 70% of EDF's share capital**

## SHARES INFORMATION AS OF 31/12/2021

	Shares
Number of shares	3,238,676,748
Number of shares outstanding	3,238,676,748
Number of treasure shares	1,174,554
French security identification no. (ISIN code)	FR0010242511
Main index	CAC Next 20, Euro Stoxx Utilities, Stoxx Europe 600 Utilities, Euronext 100
Listing	Paris (Euronext Paris)

- Pursuant to article L 22-10-46 of the French Commercial Code, all fully-paid shares that have been held in registered form for at least 2 years in the name of the same shareholder will automatically entitle their holder to double voting right. These provisions have taken effect on 3 April 2016. As of 31 December 2021, the French State held 83.88% <sup>(1)</sup> of EDF's share capital and 89.18% <sup>(1)</sup> of EDF's voting rights

(1) On 15 January 2018, the French State entered into a share allotment agreement with EPIC Bpifrance. At 31/12/2021, BPI France owns 343,863,121 shares. The French state and EPIC Bpifrance act together and have to consult each other before every Shareholders' Meeting of EDF. The EPIC Bpifrance has undertaken not to transfer the securities, to put them back as collateral or otherwise to dispose of them.

# EDF: A LISTED COMPANY MAJORITY OWNED BY THE FRENCH STATE

## EDF STATE-OWNED COMPANY: LEGAL AND CONTRACTUAL FRAMEWORK

- EDF's chairman and CEO is appointed by decree of the President of France on recommendation of the Board of Directors, after opinion of the relevant committees of the French National Assembly and the Senate
- The Board of Directors can be composed of 3 to 18 members, including members appointed by the Shareholders' Meeting<sup>(1)</sup>, a State representative<sup>(2)</sup>, and one-third of employees' representative elected in accordance with the provision of the Act of 26 July 1983
- Some decision related to financials, investments, acquisitions and disposals, or related to the compensation of executive officers must be subject to specific authorisation procedures (the Order of 20 August 2014 and the Decree of 9 August 1953 )
- The company is subject to controls by different authorities: State Inspector, *Cour des Comptes* (Government Audit Body), Finance Inspection
- The French State Shareholdings Agency (APE) represents the State as a shareholder

## EDF LISTED COMPANY: CORPORATE GOVERNANCE

- EDF has to abide by listed companies laws and specific standards of a public sector entity
- EDF adheres to the corporate governance AFEP- MEDEF Code and reports on its application
- EDF is subject to the rules relative to the balanced representation of women and men on Boards of Directors and has to respect the proportion of members of the Board of each sex of not less than 40%, excluding directors that represent the employees (Commercial Code and executive order of 20 August 2014).
- In accordance with AFEP-MEDEF Code, the EDF Board must include a third of independent qualified members<sup>(3)</sup>. The appointments of directors proposed to the General Meeting are in line with the diversity policy applicable to Board members (French Commercial Code).
- The Board of Directors has created five dedicated committees to review and prepare certain projects before their submission to the Board of Directors
- The Appointments, Compensation and Governance Committee reports annually on the functioning of the Board of Directors and proposes areas for improvement. Furthermore, every 3 years, this evaluation is conducted by a specialist external consultant under the supervision of the Committee
- EDF comply with internal control procedures COSO<sup>(4)</sup>

(1) If need be upon recommendation from the State, in accordance with article 6 of the Order of 20 August 2014

(2) Appointed by the Minister of Economy amongst State agents, in accordance with article 4 of the Order of 20 August 2014

(3) In accordance with the independance criteria indicated by the AFEP-MEDEF code.

(4) Committee Of Sponsoring Organizations of the Treadway Commission

# EDF'S INTERACTION WITH THE FRENCH STATE SHAREHOLDING AGENCY (APE)

- The French State Shareholding Agency, embodies and conducts the missions of the shareholder State as part of the policy directions determined by the French government. An entity with national competency under the authority of the Ministry of the Economy, Finance and Recovery, it manages the investment portfolio of the State, which invests in equity and quasi-equity in companies deemed as strategic so as to stabilise their share capital and support them in their development and transformation.
- The APE's main missions are to:
  - Embody the asset-related interests of the State in its management policy
  - Favour the economic performance of businesses as well as their long-term profitability and valuation
  - Promote the informed shareholder role of the State in company governance bodies
  - Manage the investment portfolio through acquisitions, mergers and shareholder alliances
  - Encourage exemplary behaviour in terms of pay, equality and social and environmental responsibility
- As a result, public-sector businesses are notably obliged to:
  - Inform the APE of any investment operation Regularly organise meetings with the APE on the company's strategy and financial aspects

# REGULATORY FRENCH BODIES WITH AN IMPACT ON EDF'S ACTIVITIES

## THE FRENCH NUCLEAR SAFETY AUTHORITY (ASN)

**The ASN helps monitor nuclear safety and radiation protection and informs the public in these fields. Its activity is focused on several main missions:**

- Regulation through the submitting of opinions to the French government on draft decrees and ministerial orders, and through the technical regulatory decisions it adopts
- The individual authorisations it grants for the operation of the plants, in particular the authorisations for restarting after the reactor outages
- Monitoring of the facilities that it carries out through the on-site regulatory inspections, scheduled or unannounced (with an average of 650 INB inspections per year, including 349 on nuclear power plants), in particular during compliance reviews and safety reassessments, which are mandatory for continued operation of the plant

## THE FRENCH ENERGY REGULATION COMMISSION (CRE)

**The CRE ensures the proper functioning of the electricity and gas markets for the end-customers in compliance with the energy policy objectives. The regulation fields include:**

- Energy networks
  - Access to regulated networks and their operation and development
  - Independence of network operators
- Energy markets
  - Monitor deals on energy and CO<sub>2</sub> markets
  - Monitor retail markets (for instance, making proposals for regulated tariffs' evolution)
- Regulated tariffs
  - As per the provisions of the French Energy Code, the CRE is in charge of proposing the regulated electricity sale tariffs

# OTHER CONTROL PROCEDURES INVOLVING EDF

- EDF may be subject to State audit procedures, in particular through economic and financial assessment and through verifications by the French General Finance Inspectorate (*Inspection Générale des Finances*)
- The company's accounts and management, and where applicable, those of its directly-held majority subsidiaries are under the control of the National Audit Court (*Cour des comptes*). Thus, have been published on the *Cour des comptes* website:
  - The report on EDF's international strategy (16/03/2016)
  - The report on the Électricité de Strasbourg group's management (20/05/2015)
  - The summary proceedings on working hours in the Group's main entities (16/09/2013)
  - The summary proceedings to the Minister for the Ecological and Inclusive Transition and to the Minister of Economy and Finance on the assessment of the implementation of Regulated Access to Historic Nuclear Power (ARENH) (15/03/2018)
  - The 2019 annual public report, Volume II, on the wage policy at EDF SA (06/02/2019)
- EDF must also undergo the audit procedures performed by the French Parliament





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**MARKET DATA**

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**APPENDICES**

EDF group supplies electricity and gas to some 38.5 million customers worldwide: residential 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

# EDF GROUP'S NET INSTALLED CAPACITY\* BY COUNTRY AT END-2021

\* Net capacity according to EDF's percentage ownership in Group companies, including associates and joint ventures.

In MW

**123,151**

 **69,455**  
 **7,918**  
 **11,014**  
 **34,764**

**France (1)(2)**

**92,535**  
 61,370  
 4,660 (2)  
 3,529  
 22,975

**UK (3)**

**7,647**  
 6,266  
 1,015  
 366

**Italy**

**5,734**  
 7  
 4,283  
 1,445

**Belgium**

**2,080**  
 768  
 829  
 483

**Greece**

**662**  
 394  
 268

**Netherlands**

**435**  
 435

**Germany**

**249**  
 249

**Spain**

**7**  
 5  
 2




**Poland**

**112**  
 28  
 16  
 68

**Switzerland**

**122**  
 122

**America 7,643**

 186  
 1,122  
 6,335

**United States<sup>(4)</sup>**

**4,291**  
 4,291

**Brazil**

**1,821**  
 937  
 884

**Canada**

**661**  
 661

**Chili**

**589**  
 186  
 185  
 218

**Mexico**

**282**  
 282

**Middle East 706**

 706

**Israel**

**323**  
 323

**Saudi Arabia**

**212**  
 212

**United Arab Emirates**

**170**  
 170

**South Africa**

**73**  
 73

**Egypt**

**65**  
 65

**Africa 138**

 138

**Asia 5,079**

 1,050  
 2,021  
 402  
 1,606

**China**

**3,659**  
 1,050  
 2,021  
 588

**Laos**

**432**  
 432

**Vietnam**

**402**  
 402

**India**

**586**  
 586



Nuclear



Fossil-fired (coal and fuel oil)



Gas (including cogeneration)



Renewables (including hydropower)

(1) Including small hydropower plants in mainland France and assets in overseas France.

(2) The Le Havre coal power plant has been shut down in April 2021.

(3) Closing of 2 out of 4 West Burton A units. Closing of the coal power plant of West Burton A planned in September 2022.

(4) Excluding energy storage capacity and EDF Renewables biogas production capacity

N.B. The values correspond to the first decimal or integer closest to the sum of the precise values, taking into account rounding



2021 FACTS & FIGURES

COUNTRY PROFILE




# EDF GROUP'S NET OUTPUT\* BY COUNTRY AT END-2021

\* Net output according to EDF's percentage ownership in Group companies, including associates and joint ventures.

In GWh

**547,856**

 **409,766**  
 **18,627**  
 **39,846**  
 **79,618**

**France (1)(2)**

**421,022**  
 354,394  
 8,435 (2)  
 9,801  
 48,391


**UK (3)**

**37,355**  
 33,368  
 490  
 2,601  
 895

**Italy**

**16,810**  
 33  
 12,367  
 4,410

**Belgium**

**9,023**  
 6,352  
 1,743  
 928

**Greece**

**2,362**  
 1,834  
 528

**Netherlands**

**1,744**  
 1,744

**Germany**

**616**  
 616

**Poland**

**129**  
 104  
 25

**Switzerland**

**269**  
 269

**Portugal**

**360**  
 360

**Spain**

**40**  
 38  
 2

**America 35,835**

 10,106  
 261  
 7,513  
 17,955

**USA (4)**

**22,010**  
 10,106  
 11,904

**Brazil**

**9,939**  
 7,135  
 2,805

**Canada**

**2,086**  
 2,086

**Chili**

**1,072**  
 261  
 378  
 433

**Mexico**

**727**  
 727

**Middle East 1,274**

 1,274

**Africa 334**

 334

**Asia 20,687**

 5,546  
 9,303  
 2,205  
 3,632

**China**

**15,788**  
 5,546  
 9,303  
 939

**Laos**

**1,904**  
 1,904

**Vietnam**

**2,205**  
 2,205

**India**

**789**  
 789

**United Arab Emirates**

**392**  
 392

**Turkey**

**387**  
 387

**Egypt**

**153**  
 153

**South Africa**

**181**  
 181



Nuclear



Fossil-fired (coal and fuel oil)



Gas (including cogeneration)



Renewables (including hydropower)

(1) Including small hydropower plants in mainland France and assets in overseas France.

(2) The Le Havre coal power plant has been shut down in April 2021.

(3) Closing of 2 out of 4 West Burton A units in October 2021. Closing of the coal power plant of West Burton A planned in September 2022.

(4) Excluding energy storage capacity and EDF Renewables biogas production capacity. The nuclear production corresponds to the 2021 production of the CENG plants, sold in August 2021

N.B. The values correspond to the first decimal or integer closest to the sum of the precise values, taking into account rounding



2021 FACTS & FIGURES

PROFIL PAYS

# FRANCE – COUNTRY PROFILE

## KEY POINTS

- EDF is active across the whole electricity value chain, from generation to sales and optimisation/trading. The activities can be split into:
  - **Non regulated activities:** generation and supply, optimisation and trading
  - **Regulated activities,** with **RTE**<sup>(1)(2)</sup> (transmission) and **Enedis**<sup>(2)</sup> (distribution). EDF's activities in Corsica and the French overseas departments and municipalities are managed by the **Island Energy Services** (SEI), **Island Electric Production** (PEI) and are regulated, as well as the activities of the subsidiary **ÉS** (Électricité de Strasbourg)<sup>(3)</sup>
- EDF owns the largest nuclear fleet worldwide, o/w 56 operating plants in France
- RTE<sup>(1)</sup> and Enedis are subsidiaries of EDF but are operationally independent (legal unbundling), within the meaning of the provisions of the French Energy Code
- EDF also plays a holding role through the 100% control of **EDF Renewables**<sup>(4)</sup> and **EDF International** (which controls the greater part of EDF stakes in international subsidiaries) as well as stakes in various companies, including:
  - **EDEV** (o/w, Électricité de Strasbourg, etc.)
  - **Dalkia** (energy services provider of which Dalkia Electrotechnics / Citelum)
  - **EDF Trading** (market operator for the Group)
  - **Framatome** (supplier in the nuclear industry), see the [p. 91](#)

(1) RTE is consolidated by the equity method via the CTE holding company

(2) Subsidiaries managed with complete independence, within the meaning of the provisions of the French Energy Code

## INSTALLED CAPACITY AND OUTPUT IN 2021<sup>(5)</sup>

CAPACITY	MW	%
Nuclear	61,370	69
Hydro <sup>(a)(c)</sup>	20,120	23
ENR excl. hydro <sup>(4)</sup>	2,235	3
Thermal <sup>(b)(d)</sup>	4,945	6
<b>Total <sup>(c)</sup></b>	<b>88,670</b>	<b>100</b>

- a. Excl. Corsica and the French overseas department, *i.e.* 439MW in 2021
- b. Excl. Corsica and the French overseas department, *i.e.* 1,567MW in 2021.
- c. Tidal capacity of 240MW included.
- d. Excl. Dalkia and excl. Le Havre coal power plant, shut down in April 2021.

OUTPUT	TWh	%
Nuclear	360.7	86
Hydro <sup>(e)(f)</sup>	41.8	10
ENR excl. Hydro <sup>(4)</sup>	4.5	1
Thermal <sup>(g)</sup>	10.5	3
<b>Total</b>	<b>417.5</b>	<b>100</b>

- e. Excl. Corsica and the French overseas department, *i.e.* 1.3TWh in 2021
- f. Output including pumped volumes
- g. Excl. Corsica and the French overseas department, *i.e.* 4.8TWh in 2021

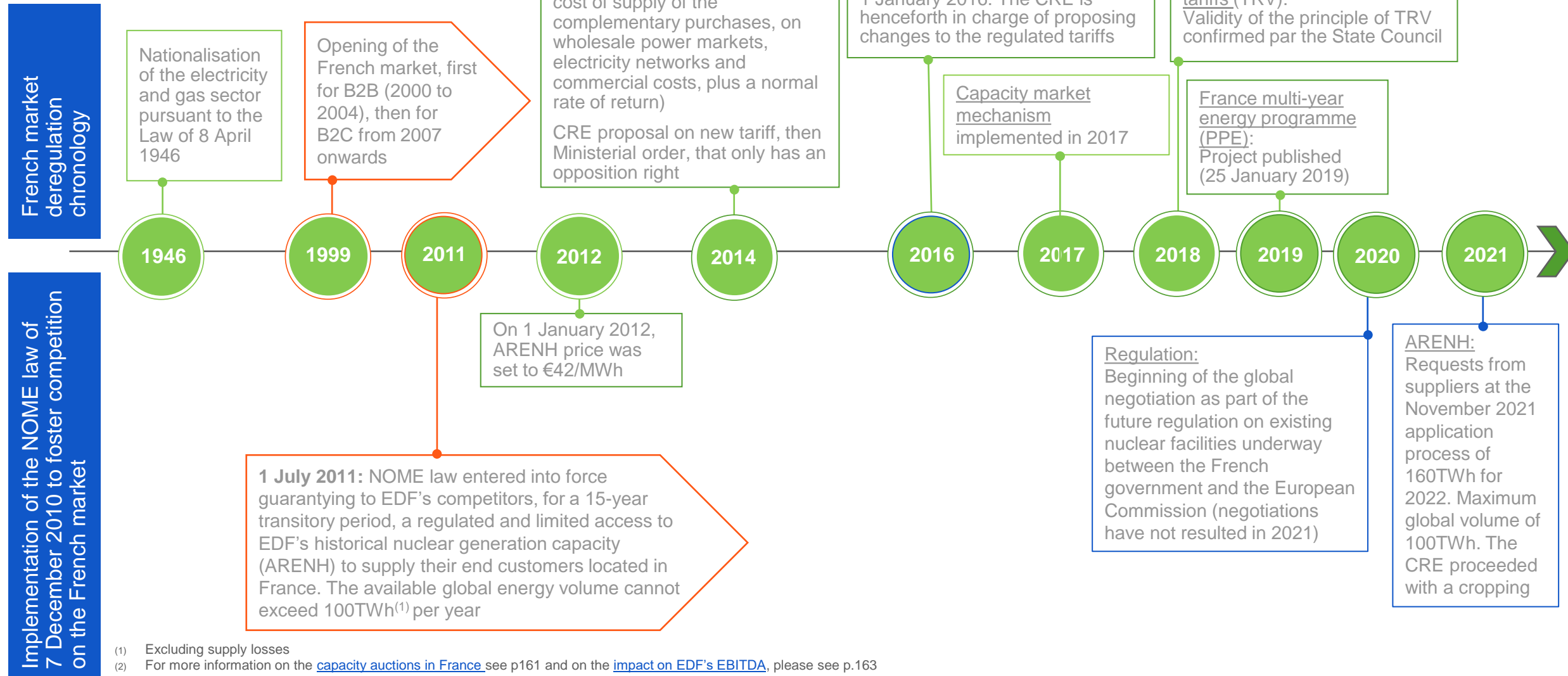
EBITDA 2021 of the France Segments excl ENR	€m
Generation & supply	7,394
Regulated	5,992

(3) For more information on the [Electricité de Strasbourg](#) activities, please see the p. 149














(4) For more information on the [Renewables activities](#) including EDF Renewables, please see the p. 112, including investments in affiliates and joint ventures.

(5) Data from fully consolidated entities

# MARKET DEVELOPMENT IN FRANCE



# FRANCE RELANCE & FRANCE 2030 PLANS AND EDF

	France Relance	France 2030	EDF entities benefiting from these plans
ENERGY RENOVATION OF BUILDINGS	<ul style="list-style-type: none"> <li>➤ Strengthen the energy renovation of private housing (€2bn spread over 2021 and 2022, the “MaPrimRenov” scheme), social housing (€0.5bn) and public buildings (€4bn) and €0.2bn for VSB-SMB</li> </ul>		    
INDUSTRY DECARBONATION	<ul style="list-style-type: none"> <li>➤ €1.2bn over 2020-2022</li> <li>➤ Low carbon heat (heat recovery, biomass, heat pump, waste-to-energy, heat network, etc)</li> <li>➤ <b>Energy efficiency</b> and electrification of processes</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>€5bn by 2030</b></li> <li>➤ Reduce greenhouse gas emissions by 35% compared with 2015</li> </ul>	
NUCLEAR	<ul style="list-style-type: none"> <li>➤ <b>€490m over 2020-2022</b></li> <li>➤ Maintain skills and support the competitiveness of businesses</li> <li>➤ Promote <b>innovation</b>, in particular the development of French small modular reactors (<b>SMR</b>) <b>Nuward</b></li> <li>➤ Création of the <b>Fund France Relance Nucléaire</b></li> <li>➤ Deploy the Fessenheim “Technocentre” project (recycling of very-low-level metal waste)</li> <li>➤ Finance innovative solutions for radioactive waste management</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>€1bn by 2030</b> devoted to: <ul style="list-style-type: none"> <li>– the development of small modular reactors and innovative reactors enabling the fuel cycle to be closed</li> <li>– the development in France innovative <b>small-scale nuclear reactors</b> with <b>enhanced waste management</b></li> </ul> </li> </ul>	  
HYDROGEN AND RENEWABLES	<ul style="list-style-type: none"> <li>➤ Put France at the forefront of generation technologies of renewable and low-carbon hydrogen (€7.1bn by 2030, of which €3.4bn by 2023)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Become <b>the leader in green hydrogen</b></li> <li>➤ In 2030, France will be home to at least two electrolyser gigafactories and produce huge quantities of hydrogen</li> <li>➤ The target is to invest over €500m in disruptive technologies and renewable energies, particularly <b>onshore and offshore wind and photovoltaic</b></li> </ul>	  
ELECTRIC MOBILITY	<ul style="list-style-type: none"> <li>➤ Increased support for <b>the purchase of clean vehicles</b> (€1.9bn)</li> <li>➤ Acceleration in the deployment of <b>charging stations for electric vehicles</b>: 100,000 charging stations expected in France by 2021, accessible to the public</li> </ul>	<ul style="list-style-type: none"> <li>➤ Produce nearly 2 million electric and hybrid vehicles by 2030</li> </ul>	 



# UNITED KINGDOM – COUNTRY PROFILE

## KEY POINTS

### Main entity:

**EDF Energy**, one of the UK's largest energy companies and the largest producer of low carbon electricity



### 3 principal activities:

- 1. Customers and services:** power and gas supply and customer services for residential and business customers (5.5 million residential customer accounts at the end 2021 pour **EDF Energy**). Optimisation and risk management services for the EDF group as well as for third parties, via **EDF Trading** (see [p.154](#))
- 2. Generation:** 13 reactors in 7 nuclear power stations <sup>(1)</sup>, 1 coal-fired power station <sup>(2)</sup> (with open-cycle gas turbine (OCG)) and 1 gas-fired power station <sup>(3)</sup>.  
Renewable energy generation from wind farms by **EDF Renewables** (JV EDF Energy and EDF Renewables) (see [p.113 ff.](#))  
Development of large-scale batteries and high-volume power connections to enable rapid electric vehicle charging through **Pivot Power** (see [p.129](#))
- 3. Nuclear New Build:** In partnership with China General Nuclear Corporation (CGN), EDF is building two new nuclear units (3.2GW capacity in total) at Hinkley Point C in Somerset, based on the EPR technology. EDF Energy is also leading the development of plans for a similar 3.2GW EPR project at Sizewell in Suffolk, with active support from the UK Government and discussions ongoing regarding the funding of the project

### Strategy:

- The purpose of EDF Energy is to help Britain, in the context of its transition to Net Zero
- Cost efficiency and an effective, resilient operating model remain key priorities
- In electricity generation, EDF's key priority is to sustain safe, reliable and commercially viable operations. This includes supporting security of supply.

## 2021 supply market share

Electricity supply: ~43TWh **~11 % <sup>(4)</sup>**

Domestic Gas supply: ~36TWh **~10 % <sup>(4)</sup>**

## 2021 key figures

EBITDA 2020 of the UK: -€21m

	Capacity (MW) <sup>(7)</sup>	Output (TWh) <sup>(7)</sup>
Nuclear <sup>(1)</sup>	7,833	41.7
ENR <sup>(6)</sup>	366	0.9
Gas <sup>(3)</sup>	-	2.6
Fossil-fired excl. gas <sup>(5)</sup>	1,015	0.5
<b>Total</b>	<b>9,214</b>	<b>45,7</b>

## Did you know ?

The **Pod Point** acquisition has strengthened and created significant value for EDF Energy in the UK. In 2021, the Pod Point growth has been secured by an IPO

In 2021, EDF Energy accelerated the promotion of Electric Vehicles (EV) solutions for its existing customer base, and capture a significant share of customers churning when buying an EV

(1) At December 2021 (after closure of Dungeness B and Hunterston B) and Including Centrica's 20% stake.

(2) The West Burton A Power Station entered in to partial decommissioning on 1st October 2021, reducing the available units from 4 to 2

(3) The West Burton B CCGT Power Plant was sold on 31<sup>st</sup> August 2021

(4) UK Gas and Electricity market share as per Cornwall data at end of Oct 2021

(5) Coal capacity represents transmission entry capacity. Net power including biomass.

(6) For more information on the [Renewables activities](#) including EDF Renewables, please see the p. 112, including investments in affiliates and joint ventures.

(7) Data from fully consolidated entities.

# ITALY – COUNTRY PROFILE

## KEY POINTS




The Italian gas and electricity markets are strategic for EDF firstly for their major significance in Europe, secondly for their connection to the French markets and the key position in the Mediterranean basin



### Edison:

- Edison is a major player <sup>(1)</sup> in the Italian energy market and is active in:
  - the production of power from renewable sources and gas
  - in gas midstream activities (supply of natural gas mainly through long term contracts, storage and distribution)
  - in the sale of electricity, gas as well as energy and environmental services to the final market and services and infrastructures for sustainable mobility (small scale LNG)
- Edison has recently changed its business model by disposing its E&P activities <sup>(2)</sup> and entered a financial partner in 49% of Edison **Renewables** <sup>(5)</sup> with the goal to accelerate capacity development, **in order to play as a responsible operator and a leader in the transition of Italy to an efficient and clean sustainable energy.**

### Key strategic priorities:

-  **RENEWABLES**
  - **Increase wind and PV capacity from 1.1 to 4 GW** gross by 2030 with a development plan of €3bn investments by 2030
  - 40% of the production from renewable sources by 2030
  - Development of flexibility tools (storages etc.)
-  **CLIENTS AND SERVICES**
  - Increase customer base and competitive positioning
  - Help clients and territories to achieve competitiveness, efficiency, environmental sustainability and personal well-being
  - Support mid-large clients and PA in reducing energy costs and environmental footprint
-  **GAS/ GREEN GAS ACTIVITIES**
  - Development of latest gas generation to offset typical intermittency of non-programmable renewable sources and to reduce emissions
  - Be a key contributor in green gases development (H<sub>2</sub> and bio-CH<sub>4</sub>)

## 2021 GROUP KEY FIGURES IN ITALY

	Capacity <sup>(a)</sup> (MW)	Output <sup>(a)(1)</sup> (TWh)
Thermal	4,472	12.8
Hydro	866	2.7
Other renewable	1,068	2.0
<b>Total</b>	<b>6,406</b>	<b>17.4</b>

a. Incl. Generation and energy efficiency services. Data from fully consolidated entities.

**Generation fleet** in Italy is made up of **98** hydropower plants, **14** thermal power plants, **50** wind farms and **64** photovoltaic power plants

2021 EBITDA in Italy: €1,046m

### 18.9Gm<sup>3</sup> of gas sold to end customers

*O/w 11% to the residential sector, 31% to the industrial sector and 27% for thermoelectric uses (including Edison's own internal needs)*

**12.7Gm<sup>3</sup> of natural gas imports** by Edison, i.e. 18% of the country's natural gas imports. Long-term gas supply contracts in countries other than Russia

**1.6 million sales contracts** of power, gas and energy services

(1) According to the 2021 ARERA report based on 2020 data Edison is the 3rd largest producer at national level. Edison's net electricity output in Italy in 2021 represents ~6.3% of net Italian electricity generation

(2) Excluding Algeria the divestment of which is planned at a later date.

(3) For more information on energy efficiency activities, see p.181

(4) For more information on the group gas activities, see pages 188

(5) Edison retains control over the renewables platform

# BELGIUM AND NETHERLANDS – AREA PROFILE

## Key points

The Benelux region includes important interfaces with the Franco-German electric power plate and plans for new connections to Germany and Great Britain are under consideration. The Benelux is also an important node in the European gas market due to its numerous import and transit infrastructures

### Main entities:

- Luminus**
  - EDF majority shareholder (**68.63%**), through EDF Belgium (100%)
  - 2<sup>nd</sup> largest player in the Belgian energy market with 10% of the national generation capacity. Total electricity output of **7.0TWh** in 2021.
  - Present in renewable energies through 7 hydropower plants.
  - Leader in wind power with **82 onshore wind farms**, the Group built 25 wind turbines with an additional capacity of 67MW in 2021, for a total of **658MW**
  - Thermal park in Belgium composed of several plants (combined cycles and open cycles) for a total installed capacity of **1,208MW**
  - Owning 10.2% (**419MW**) of the nuclear power plants Tihange 2 and 3, and Doel 3 and 4. Luminus also has **100MW** of drawing rights on the French Chooz B nuclear power plant.
  - On the B2B market, acquisitions of Elektro Clarysse, Chauffage Coussement and Emaco International, strengthening the Luminus position in energy services
- EDF Belgium:** wholly-owned by EDF, it holds 50% of the Tihange 1 nuclear plant, or 481MW, representing 2% of Belgian generation capacity
- Sloe Centrale B.V. (Netherlands):** with top-level technical performances, the CCGT Sloe plant was called on to operate for **5,029** hours with an availability rate of over **98%**

## 2021 key figures

Pays	Company	Main activities	Technical data
Belgium	EDF Belgium	Electricity generation	<b>Nuclear installed capacity: 481MW</b>
Belgium	Luminus	Electricity generation Electricity and gas sales	<b>Installed capacity: 2,358MW</b> 16.5% gas market share and 17.8% electricity market share in Belgium <b>Delivery points: ~2.1 million</b>
Netherlands	Sloe Centrale B.V	Electricity generation	<b>Installed capacity CCGT: 870MW</b>

In 2021, EBITDA in Belgium amounted to €125 million (Luminus: €70m, EDF Belgium €55m)



In 2021, Luminus was awarded the Top Employers in Belgium for the 10<sup>th</sup> consecutive year

## Did you know ?

By end-2024, the company aims to generate **828MW of wind power**. This ranks Luminus as a **wind-power leader in Belgium**. The company's 82 onshore wind farms comprise 263 turbines, located in Wallonia and Flanders.

# NORTH AMERICA – AREA PROFILE

## Electricity

- **In North America** the group has more than 6GW of gross installed capacity and sold the stake in CENG nuclear business in 2021.
- **Activities :**
  - **Renewable energies:** EDF Renewables holds 7.1GW of net capacity installed or in construction, mainly located in the USA, and close to 12.9GW managed for own account or third parties
  - **Trading:** EDF Trading operates in the Northern American markets for electricity (including financial transmission rights) and gas markets. EDF Trading activities also include trading of RECs <sup>(1)</sup>, biogas, carbon emissions and credits and weather derivatives
  - **Framatome** also helps to supply electricity to 36m North American households

## Energy services

- **Trading:** EDF Energy Services (a wholly-owned subsidiary of EDF Trading North America) provides management and optimization services to thermal, wind, PV and hydro power plants generators
- **Local energy management and energy efficiency:** through Dalkia, a 100% owned subsidiary of the EDF group.

## Energy supply

- **Commercialisation of gas and electricity:** EDF Trading, through its subsidiary EDF Energy Services, is part of the Top 3 suppliers to non-residential customers in North America, offering all environmental products, natural gas and electricity

## R&D

- **EDF Innovation Lab:** located in Silicon Valley, this R&D and Innovation team partners with local Universities and Utilities to develop innovative projects on the future of energy markets, distributed resources integration and electric mobility. It also works with EDF Corporate Venture Capital in order to identify relevant investment opportunities among US startups

(1) Renewable Energy Certificate

# SOUTH AMERICA – AREA PROFILE

## Brazil

- **EDF Norte Fluminense** (EDF NF)
  - The Group owns 100% of **EDF Norte Fuminense**, which has built and operates a CCG<sup>(1)</sup> with an installed capacity of **826MW**
  - EDF NF owns 51% of Sinop Energia (CES), which is responsible for the construction and operation of the **Sinop** hydroelectric facility (**402MW**) commissioned in 2019
  - In 2021, EDF Norte Fluminense signed a 10-year contract for assistance in the construction, operation and maintenance of the Marlim Azul Combined Cycle Gas Power Plant.
- **EDF Renewables:** (100% owned subsidiary of EDF) has been present in Brazil since 2015, with a net capacity of 480MW in wind power (Ventos da Bahia and Folha Larga Phase), and 199MW in solar power (ex: Pirapora II) as well as 380MW in wind power under construction
- EDF is also present in Brazil through the activities of **Edison** (Iberitermo subsidiary (50% stake) which operates a CCG of 226MW)

## Chile

- The group subsidiary **EDF Andes** <sup>(2)</sup> acquired **755MW** of flexible generation capacity (**gas and peak**) in 2018 to support the development of its renewable activity in Chile by compensating for the fluctuations in wind and solar generation. EDF Andes is converting to **gas** one of its two peakers
- Since September 2021 EDF Andes has launched the construction of a **480MW solar power plant**. **EDF Renewables** hold the solar power stations of Bolero (146MW gross) and Santiago Solar (115MW gross), and the wind farm of Cabo Leones 1 (175MW gross). Cabo Leones has extended its capacity to +60MW in 2021

## Peru

- Signature of a RE PPA with the town of Iquitos (Peru - 500,000 h. - the largest non-interconnected city in the world): **100 MW PV + 100 MWh battery**
- Call for tenders won to modernize and decarbonize small isolated electrical systems in Peru through decentralized production for approximately 100,000 inhabitants, equal to **55 MW of solar energy** and **110 MWh of batteries**. Construction launched



Solar plant of Pirapora in Brazil

(1) Combined cycle gas plant  
(2) Formerly known as EDF Chile

# MIDDLE EAST– AREA PROFILE

## United Arab Emirates

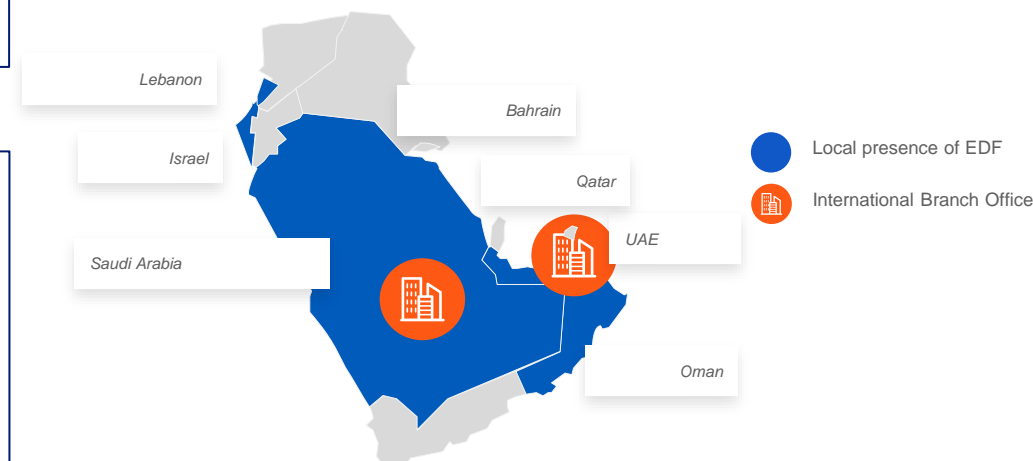
- The PV solar plant “**DEWA III**”, developed jointly by EDF Renewables and Masdar represents the third phase (800MWac) of one of the world's most powerful solar power plant, near Dubai. The generation threshold of 5GWh, corresponding to 3 million tonnes of CO<sub>2</sub> emissions avoided, was reached in November.
- The construction of the “**Al Dhafra PV2**” photovoltaic project – a contract won in 2020 by the international consortium formed by EDF Renewables and Jinko Power (China) and since then joined by the local shareholders Taqa and Masdar – began in 2021. With installed capacity of 2GW, Al Dhafra will be the world's most powerful solar plant when commissioned, which is planned in 2023.
- In addition, EDF operates a management assistance project of a 250MW pumping station dam, planned to be developed in the **Hatta** mountains in the Emirate of Dubai, as well as a second project for the construction of a fossil-fired power plant in Al Aweer with a capacity of 3 x 233MW, for DEWA customer
- Founding in April 2021 of Emerge, a joint venture developed by EDF and Masdar to develop solar energy, energy efficiency and public street lighting projects.

## Saudi Arabia

- The “**Dumat Al Jandal**” wind project co-developed by EDF Renewables and Masdar was commissioned in December 2021. With an installed capacity of 400MW, the wind farm is the first one in Saudi Arabia and the most powerful in Middle East
- EDF Renewables, in partnership with Masdar and Nesma Renewables, has begun work on the 300MW “**South Jeddah**” photovoltaic project. Due to be commissioned in 2023, South Jeddah will be the Group's first photovoltaic project in Saudi Arabia.

## Israel

- Since 2010, EDF Renewables has owned a subsidiary in Israel in solar energy. At end-2021, it had 412MW of gross installed capacity, 104MW under construction, an additional 400MW won as part of calls for tenders, to be connected in 2023-2024.
- EDF Renewables Israel won several new calls for tender in 2021 for circa 35MW of projects combining photovoltaic generation with other land uses (farming, landfills, etc.) and some 70MW on the installation of photovoltaic roofs and shaded areas by 2024.
- The subsidiary is also active in the fields of electricity storage, wind power and wave energy.





# CHINA – COUNTRY PROFILE

The EDF group is one of the largest foreign investors in the electricity sector in China, with shareholdings in nuclear, renewable and thermal power plants for a **total net capacity of 3,400MW<sup>(1)</sup>**

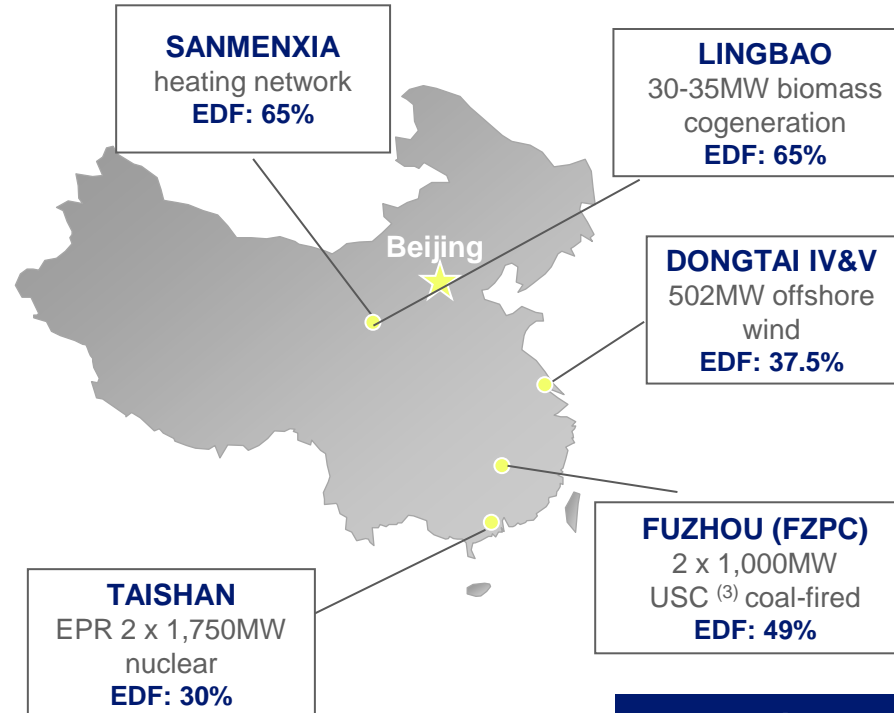
## Nuclear

- As the first foreign company to invest in a project to build and operate a **nuclear power plant** in China, EDF owns 30% of **Taishan** (TNPJVC), which operates two EPR nuclear reactors. Unit 1 was the first EPR in the world to enter commercial service in December 2018 and Unit 2 was commissioned in September 2019
- **Partnership with CGN**: On 29 September 2016, **EDF and CGN** signed the final contracts for the Hinkley Point C power plant project <sup>(2)</sup>. EDF's stake in Hinkley Point C is 66.5% and CGN's is 33.5%.

## Thermal

- EDF owns 49% of FZPC, which built and operates the “ultra-supercritical” **coal-fired power plant** of **Fuzhou**. This technology ensures better efficiency (~ 44% for Fuzhou) and limited environmental impact. EDF holds minority shares in two other thermal power plants
- Consistent with its commitment to withdraw from coal-generated electricity by 2030, EDF has begun to sell off its thermal assets with the transfer of two units of the Shiheng plant on 1 January 2022.

## Main assets in China



## Renewables

- **EDF Renewables** acquired in 2016 a majority share (80%) in UPC Asia Wind Management (AWM), which develops and builds **wind power** projects in China. In 2018, EDF Renewables diversified its activities in distributed solar power by creating a joint venture with ACC to develop **solar roof solutions** for industrial customers. End-2021, net installed capacity amounts to **254MW in wind** and **123MW in solar** power
- In **offshore wind energy**, EDF Renewables is operating the Dongtai IV (**302MW**) and Dongtai V (**200MW**) wind farms in partnership with China Energy Investment.

## Energy services

- In 2021, the Group commissioned two air-conditioning networks for a tourist complex and a business district
- EDF operates since 2016, a heating network in the city of Sanmenxia (Henan). In the nearby town of Lingbao, EDF operates a 30-35MW biomass cogeneration power plant

## New Business

- Battery exchange stations for electric vehicles
- Offer of computer-aided engineering services based on EDF software
- Brokerage, direct sales and advisory services in the retail and wholesale electricity markets for suppliers and end consumers, as well as energy services.

(1) Data in proportion to EDF's equity

(2) For more information on the [Hinkley Point C](#) EPR project, see p. 84-85

(3) SC = "supercritical" technology, USC = "ultra-supercritical" technology

# SOUTHEAST AND SOUTHERN ASIA – AREA PROFILE

## India

- In March 2018, the EDF group and the Indian energy company NPCIL<sup>(1)</sup> signed an industrial agreement for the construction of 6 EPRs on the Jaitapur site in India. With a total power of about **10GW**, Jaitapur would be the largest nuclear project in the world<sup>(2)</sup>
- **Dalkia Electrotechnics / Citelum**, an EDF subsidiary specialised in street lighting, is also present in India where it manages **178,000** lighting points in the city of Ahmedabad
- A roll-out **smart meters** project was signed in 2018 and officially launched in March 2019 with EESL 3 for 5 million Smart meters, and with NDMC for 75,000 Smart meters installed by EDF International Networks
- **Wind and solar power sectors:** At the end of 2021, the Group's installed renewables power (excl. Hydro) capacity is **586MW net**

## Vietnam

- In 2021, EDF owns 56.25% of Mekong Energy Company (MECO), the company that owns Phu My 2.2, a combined cycle plant with a capacity of **715MW**. This is the 1st exclusively foreign-investment IPP<sup>(3)</sup> project launched in Vietnam. The BOT contract (Build, Operate, Transfer) has a duration of 20 years. In 2005, EDF completed the turnkey delivery of the plant, which MECO now operates
- The **Son My 1** project concerns the construction and operation of a regasified LNG (liquefied natural gas) combined cycle plant with optimised environmental performance of approximately **2,250MW**, scheduled to be commissioned in 2025. In March 2018, the EDF group was appointed leader of the consortium (37.5%) to study the project.

## Indonesia

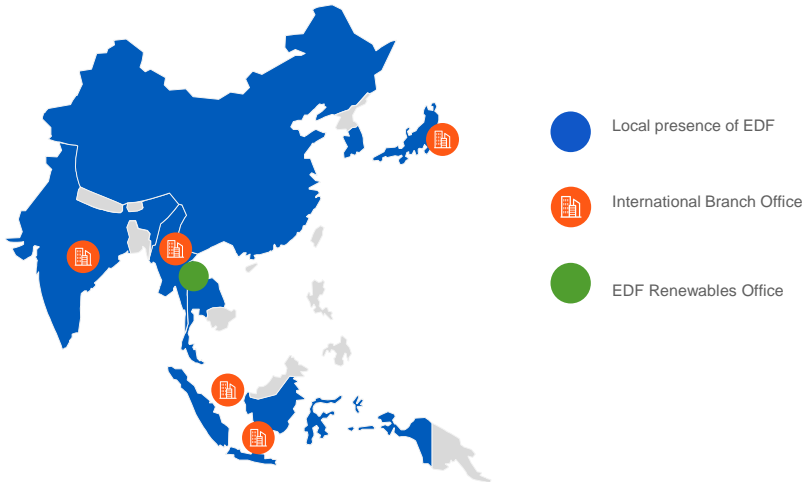
- In 2021, EDF continues its **development strategy in Indonesia** by focusing on renewable energy projects and the acceleration of access to electricity in the country's most distant islands thanks to the **development of microgrids**

## Laos

- **At the end of 2021**, the Group **owns 40% of Nam Theun 2 Power Company** (NTPC), which owns the Nam Theun 2 Hydropower Complex (**1,070MW** installed capacity), built by EDF under a turnkey contract. NTPC company operates the power plant on a 25-year contract
- A project to develop an hybrid **floating solar farm** of 240 MW on the Nam Theun 2 hydroelectric dam reservoir was launched in 2019. In 2021, signature of a PDA<sup>(4)</sup> with the Laos government and a MoU with partners.

## Singapore

- In 2014, the EDF Group opened a centre of excellence for sustainable cities in Asia, called **EDF Lab Singapore Pte. Ltd (the "Lab")**
- The Group has now established a solid base in Singapore to coordinate its development in South-East Asia, boost synergies with the Lab and contribute to the development and innovation ecosystem relative to smart grids, electric mobility, smart cities and interconnections. The goal is to increase the share of renewable energies in traditionally high-carbon countries



(1) Nuclear Power Corporation of India Ltd.  
(2) See press release 10/03/2018  
(3) Independent power plant  
(4) Project Development Agreement

# AFRICA – AREA PROFILE

The Group wishes to develop in Africa by assisting countries with high-energy demand, on a selective basis appropriate to each geographical 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

- Since 2007, EDF has a subsidiary in Johannesburg, focused on reviving the South African nuclear program and the development of the Group activities in Austral Africa
- **Wind energy sector:** Since 2011, EDF Renewables has been developing in the wind energy market and operates 4 wind farms with a gross capacity of **142MW** through its 84%-owned EDF Renewables South Africa subsidiary.
- In December 2018, EDF acquired **30%** of GIBB POWER, a subsidiary of the South African group GIBB Engineering and Architecture, in order to increase its activity in thermal engineering, hydraulics, transmission and distribution services.

## Morocco

- **Solar energy sector:** In 2019, the EDF Renewables – Masdar - Green Of Africa consortium successfully bid for the first phase of the **Noor Midelt 1** solar project in Morocco, using a hybrid solar-storage technology. This hybrid solar project with an installed capacity of **800MW** innovatively combines concentrated solar power (CSP) and photovoltaic solar power. Discussions with the different stakeholders about the planning are ongoing
- **Wind energy sector:** EDF-RE (60%) is developing the **Taza** wind farm (150 MW project, with a 1<sup>st</sup> phase of **87MW**). The PPA was signed at the end of 2019. The construction of the first phase began on the 2 September 2020. EDF-R Morocco is supporting MASEN in the renewal of the Koudia al-Baida wind farm with the objective of doubling its capacity to 100MW. Set to begin in 2022.

## Egypt

- **Solar energy sector:** In 2019, EDF Renewables commissioned the **130MW Benban plants** in partnership with the Egyptian group Elsewedy Electric. EDF Renewables also took a strategic share in the Egyptian company **KarmSolar** to tackle the private PPAs and micro-grid market

## Cameroon

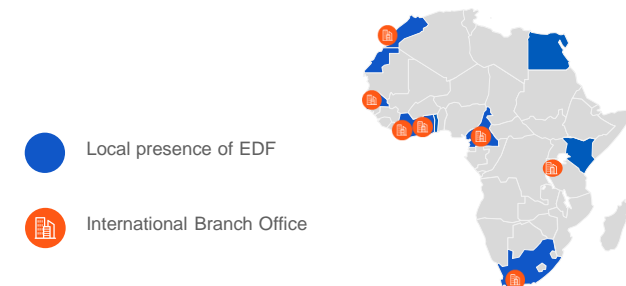
- EDF has started in February 2019 the construction works on the **Nachtigal** hydroelectric dam (**420MW**), and will operate it through its 40% stake in Nachtigal Hydro Power Company (NHPC). 52.8% of the project achieved at 31/12/2021
- In June 2021, EDF and the State of Cameroon signed a Development Agreement for a second hydroelectric dam, on the Sanaga river, on the site of **Kikot**, with capacity of about 450MW

## Ivory Coast

- In partnership with SIFCA, the Ivorian agro-industrial group and Meridiam, EDF is developing the **"Biovéa"** biomass plant project (2 x 23MW); the biggest of Western Africa. The concession agreement was signed with the State in December 2019. The financing was finalised in late 2021 and the start of work is planned to early 2022.
- In 2019, EDFI took a 49% stake in Conergies Group with top-flight development and innovation expertise in heating, ventilation, industrial and solar cooling in West Africa.

## Off-Grid

- EDF has more than 20 years of experience in the field of **"Off-Grid"** (decentralized energy). In addition to the historical activities of KES in South Africa (company created in 2002 and 50 % owned by EDF) and ERA (Senegal), the Group partners with innovative start-ups to provide energy and services to a rural clientele **in South Africa, Ivory Coast, Ghana, Senegal, Kenya, Zambia and Togo**.
- Such services enable **more than 1.5 million people** to light and power their low-consumption household appliances or also to be equipped with solar-powered water pumps
- EDF aims to **multiply this figure by 2** over the next 4 years







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**APPENDICES**

As a major player in energy transition, the EDF group is an integrated energy company 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.

# ELECTRICITY OUTPUT AS OF 31 DECEMBER 2021

*Output from fully consolidated entities*

<i>(in TWh)</i>	<b>2020</b>		<b>2021</b>	
Nuclear	384.1	76.5%	409.8	78.3%
Hydro <sup>(1)</sup>	49.4	9.8%	46.2	8.8%
ENR	19.3	3.8%	20.9	4.0%
Gas	42.0	8.4%	38.0	7.3%
Fuel oil	5.0	1.0%	5.1	1.0%
Coal	2.2	0.4%	3.5	0.7%
<b>Group</b>	<b>501.9</b>	<b>100%</b>	<b>523.7</b>	<b>100 %</b>

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

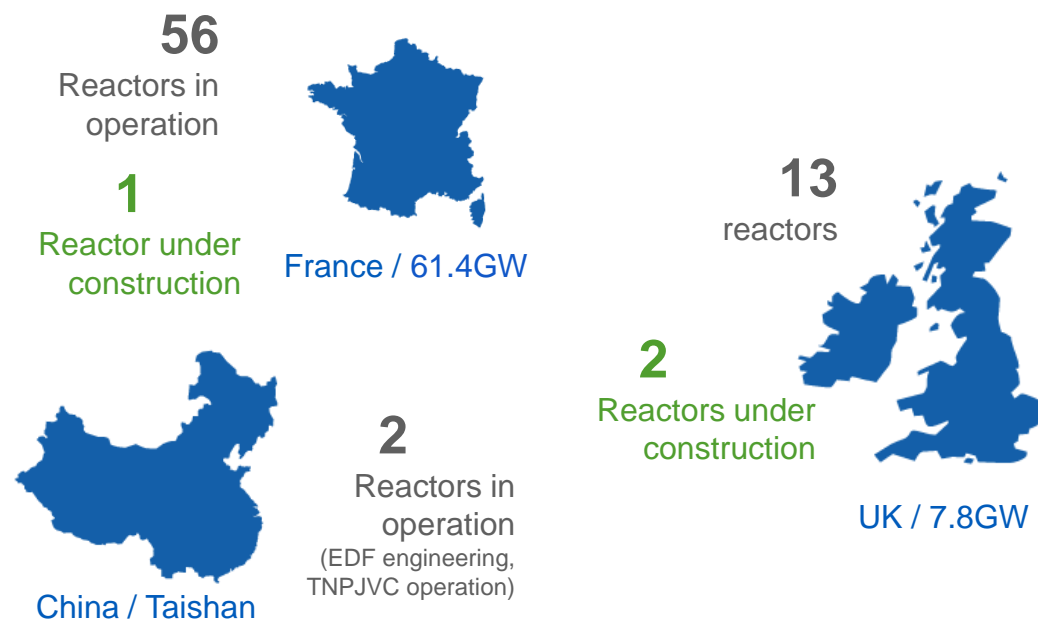
(1) Hydro output includes tidal energy for 540GWh in 2020 and 543GWh in 2021. Hydro output after deduction of pumped volumes is 43.2TWh in 2020 and 40.3TWh in 2021

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# EDF: UNIQUE EXPERTISE AND KNOW-HOW IN THE NUCLEAR INDUSTRY

## EDF, THE WORLD'S LEADING NUCLEAR OPERATOR <sup>(1)</sup>



- **To operate the existing nuclear fleet beyond 40 years**, and building the success of the first reactors to pass their fourth ten-year inspection to extend their operating life, EDF plans to invest €50.2billion over the period 2014-2025, as part of the “**Grand Carénage**” programme. The ASN authorised on the 23 February 2021 the lifetime of the 900MW fleet beyond 40 years
- The pooling of EDF and Framatome engineering teams in a joint subsidiary **Edvance** <sup>(3)</sup>, implements the re-engineering of the French nuclear sector, for **new projects in France and abroad**
- **Follow-up of the excell Plan**, to strengthen the industrial quality, the skills, and the governance of the large nuclear projects (*for more information, see [The excell plan](#) p.17*)

(1) AIEA (Agence Internationale de l'Énergie Atomique), Nuclear power reactors in the world, 2017 edition

(2) Technology partnership

## EDF, GLOBAL EXPERTISE

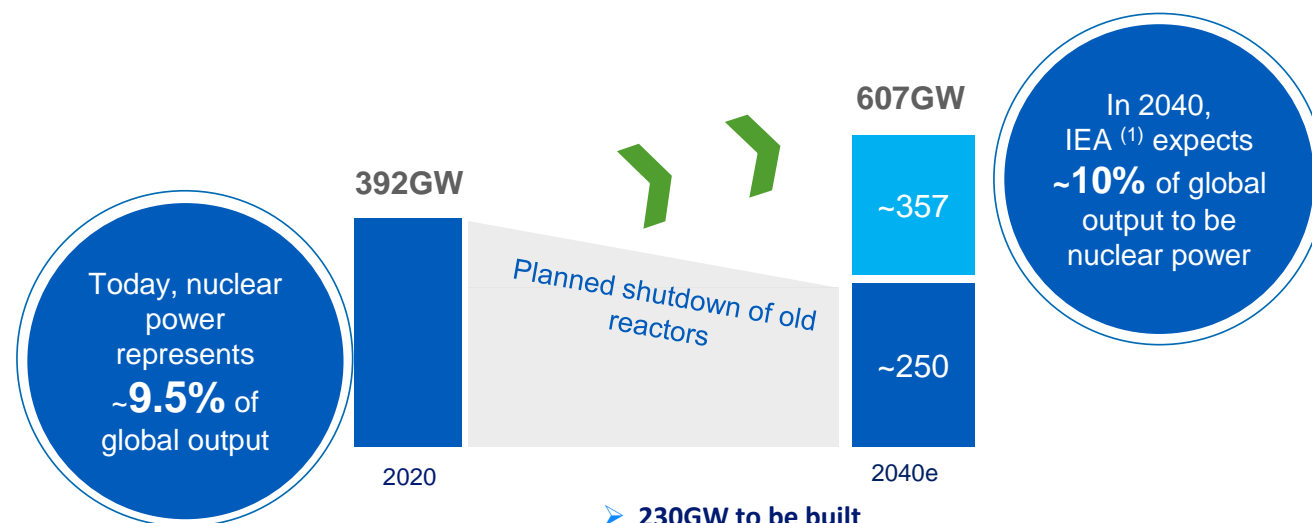
### EDF manages the entire lifecycle of nuclear generation facilities: design, operation and decommissioning

- **EDF is the world's leading nuclear operator** <sup>(1)</sup> with a standardised nuclear fleet of 56 reactors in France and 13 reactors in Great Britain
- EDF is investing **to continue the operation, safely**, of its reactors beyond 40 years in France a guarantee of the competitiveness of electricity generation
- **Construction of EPR-type reactors** throughout the world (France, Great Britain), development of an optimised version of the EPR (EPR 2) for the renewal of the French nuclear fleet by 2030 and development of a type of SMR, Nuward™, with the CEA, TechnicAtome and NavalGroup <sup>(2)</sup>
- EDF is present in the French and international markets for the **decommissioning** of nuclear power plants and **radioactive waste treatment** facilities

(3) Edvance, bringing together EDF's and Framatome's engineering expertise around the nuclear island

# UNIQUE POSITIONING IN NUCLEAR NEW-BUILD

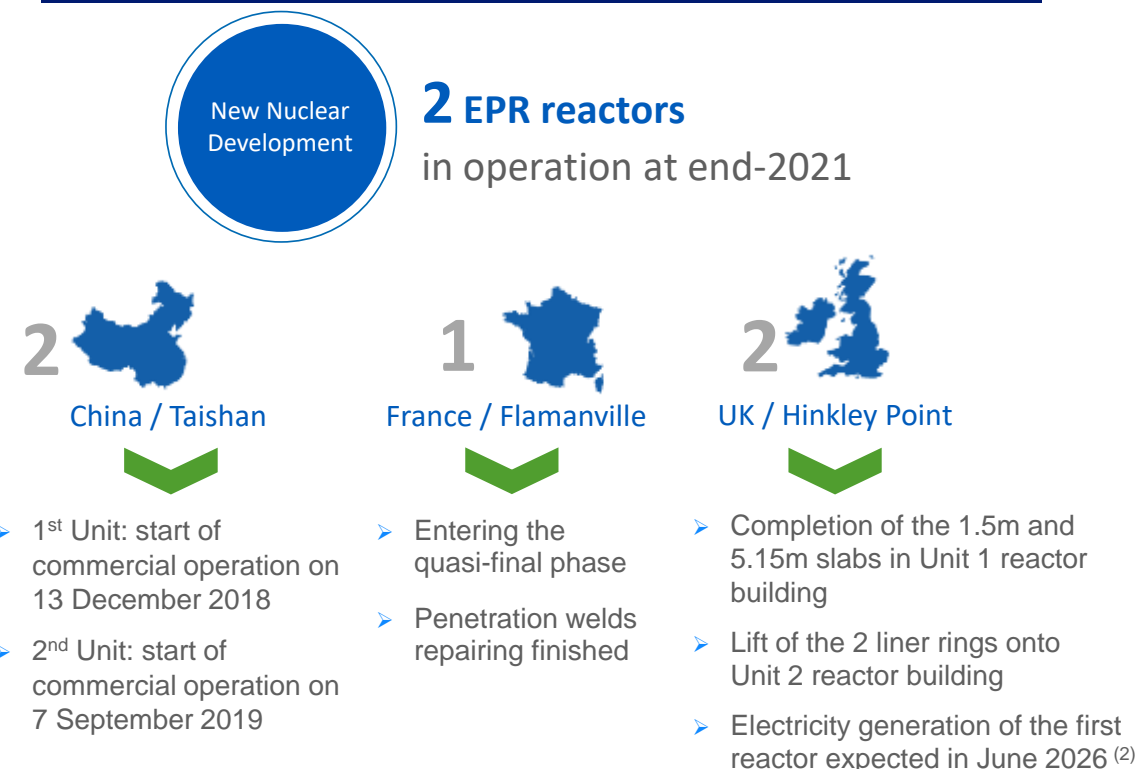
## WORLD NUCLEAR CAPACITY EXPECTED TO EXPAND OVER THE NEXT QUARTER CENTURY



- The world's primary energy demand is expected to grow by 25% by 2030. This period will be marked by a accelerated growth of the electric share of energy consumption: +4,500TWh by 2030. The electricity share in the world's final energy consumption is expected to reach 30% in 2040, compared to 20% in 2020 <sup>(1)</sup>
- The share of nuclear power in global output is to stay relatively stable between 2020 and 2040, at 10%
- According the IEA, the aim to reach carbon neutrality by 2050 would need up to 730GW of installed nuclear capacity

<sup>(1)</sup> International Energy Agency's "Sustainable development" scenario based on 2020 data.  
<sup>(2)</sup> See press release of 27 January 2021

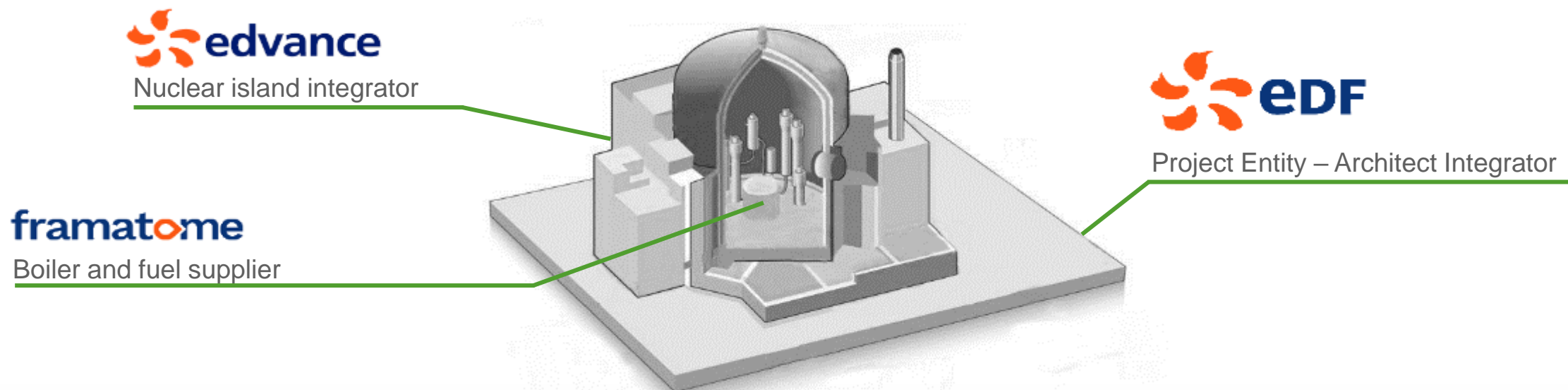
## UNIQUE POSITIONING ON GLOBAL NEW NUCLEAR BUILD GROWTH



In 2016, EDF also signed two other agreements with CGN concerning development of two nuclear construction projects **in the UK**, Sizewell C and Bradwell B. The UK Government is in active negotiations with EDF on the Sizewell C project.

In March 2018, EDF and the Indian company NPCIL signed an industrial agreement relative to the construction by NPCIL of six EPRs at the Jaitapur site **in India**. On 14 December 2018, EDF submitted a complete and conditioned technical and commercial offer, then a conditioned binding offer In April 2021

# NEW NUCLEAR: AN INTEGRATED CHAIN FOR CONQUERING NEW MARKETS



- **EDF Group (EDF SA, Framatome, Edvance) drives the French nuclear sector with the following goals:**
- Make project delivery and management more effective by harnessing each company's core strengths and the synergies from Framatome's integration into EDF group and the pooling of the EDF and Framatome engineering teams as part of the joint subsidiary Edvance
  - Enhance the competitiveness and appeal of our technologies and services through complementary expertises
  - Provide development opportunities for the French nuclear sector by ensuring ever greater engineering and business expertise in integrated projects

A promising market and active projects on every continent

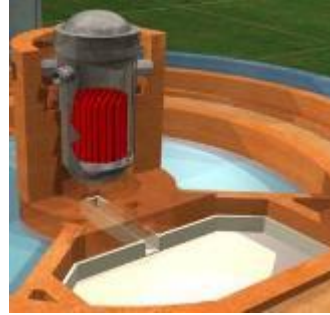
# TECHNOLOGY EPR: MAIN CHARACTERISTICS



Double-wall containment building with a shell able to resist to an airplane crash



4 independent safeguard systems



Core catcher in case of an accidental core melt



## ➤ Safety

- Accident probability reduction (factor 10)
- External hazard protection (shell able to resist an airplane crash)
- Evolutionary design (core catcher)

## ➤ Target performance

- Annual generation boosted by 36%
- Efficiency improvement (+3pts)
- Increased availability (91%)

## ➤ Radioprotection

- At least 40% cut in collective annual exposure

## ➤ Environment

- Very important reduction in radioactive waste and gaseous and liquid discharges

# FLAMANVILLE 3 EPR (1,650MW) (1/2)

## CONSTRUCTION PROGRESS

All the fuel required for the first loading now received. First regulatory inspection performed by Euratom in August 2021 confirming the good site organisation in terms of reception and storage of nuclear materials

More than 90% completion rate in the reactor building, in the machine room, and in the diesel rooms.



## UPGRADE ON THE MAIN SECONDARY CIRCUIT WELDS

### Penetration welds: Repairing the welds located on the pipes within the double concrete containment of the reactor building

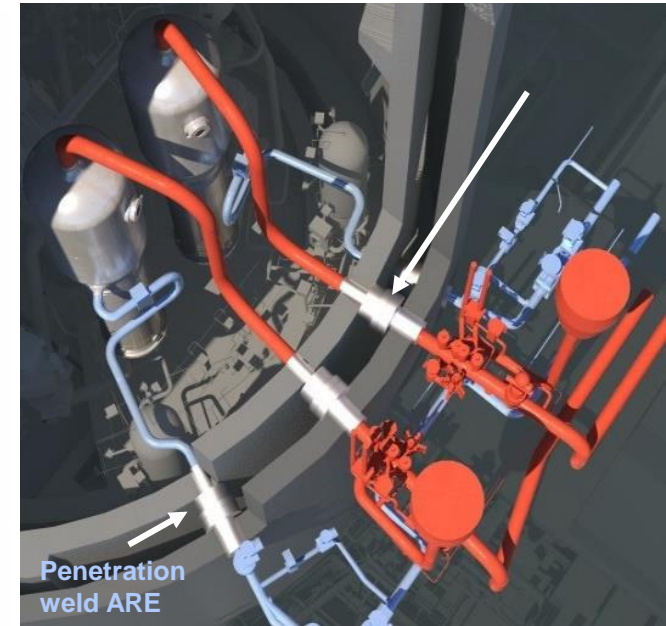
- Number of welds involved: 8 VVP <sup>(1)</sup> and 4 ARE <sup>(2)</sup>
- Status: 8 penetration welds repaired, all checked as compliant by EDF prior to stress-relieving heat treatment. The 4 ARE welds are awaiting ASN's decision on the qualification of the repair process proposed by EDF

### Other welds: Upgrading and repairing welds

- Number of welds involved: 45 VVP <sup>(1)</sup> and 32 ARE <sup>(2)</sup>
- Status : 70% of the welds involved (VVP and ARE) are being upgraded. To date, 12 VVP welds are completed before stress-relieving heat treatment

### Stress-relieving heat treatment

- VVP penetration welds: optimised stress-relieving heat treatment processes validated by the ASN
- Other welds and ARE penetration welds: part of the optimised stress-relieving heat treatment has been validated by the ASN. The pending validations, based on the supporting files provided by EDF, concern around 60 welds



VVP   
ARE 



# FLAMANVILLE 3 EPR (1,650MW) (2/2)

## OTHER TECHNICAL ISSUES

### Main primary circuit: incomplete consideration of the “break preclusion” referential concerning three nozzles

In a letter dated 8 October 2021, the ASN confirmed that it had no opposition in principle to the solution proposed by EDF, which consists in installing a “Retainer Clamp” for the treatment of these three nozzles. The design file for this solution will be examined by the IRSN

### Filtration sump SIS/CHRM <sup>(1)</sup>

- Test results carried out in summer 2021 at the ASN's request : fragments filtration issue detected
- An action plan has been defined and presented to the ASN in December 2021. The instruction is ongoing

### Lessons-learned from the technical issue at the Taishan No.1 reactor

Inspections carried out on fuel assemblies of the Taishan No. 1 reactor following the technical issue encountered during its second operating cycle showed mechanical wear <sup>(2)</sup> of certain assembly components. In the perspective of the commissioning of Flamanville 3, a solution will be instructed with the ASN, in order to carry out the potential necessary modifications

## SCHEDULE AND COSTS

In its press release on 12 January 2022, EDF has updated these elements taking account of the progress on operations and preparations for commissioning. The fuel-loading date was postponed to Q2 2023. The estimated construction completion cost has increased from €12.4bn to €12.7bn <sup>(3)</sup>

Costs arising from post-commissioning modifications are not included in the construction cost of the project

The project has no margin either in terms of schedule or completion costs

(1) SIS = Safety injection system, CHRM = containment heat removal system

(2) See press release of 12 January 2022

(3) In 2015 euros, excluding interim interest (see note 10.6 of the Group financial statements). This estimate takes into account the analytical allocation of part of the compensation paid by AREVA under the settlement agreement reached on 29 June 2021



# HINKLEY POINT C: PROJECT OVERVIEW

<b>Location</b>	Bridgwater, Somerset, UK
<b>Technology</b>	Two UK EPR reactors
<b>Capacity</b>	3.2GW (2 x 1.6GW)
<b>Operating life</b>	60 years+
<b>Responsible Designer</b>	EDF
<b>Main contractors</b>	Framatome, GE, Bouygues/Laing O'Rourke, Alliance of Cavendish Nuclear/Balfour Beatty/Altrad/NG Bailey and Doosan Babcock
<b>Contract for difference</b>	CfD strike price fixed over 35 years: £ <sub>2012</sub> 92.50/MWh or £ <sub>2012</sub> 89.50/MWh (indexed to British inflation) if a FID is taken for Sizewell C
<b>Investors' participation</b>	EDF Energy: 66.5% ; CGN: 33.5%



# HINKLEY POINT C

## MANAGEMENT OF THE PANDEMIC

- Since the beginning of the pandemic, the project has taken extensive measures to guarantee the safety of workers on site and in its offices. These measures are being continuously adapted to apply best practices and to be able to keep the number of infections as low as possible
- Covid still has an impact on the project's productivity.
- Number of people working on site increased from c. 5,000 in January to c.7,400 at end-2021

## CONSTRUCTION PROGRESS

- The 1.5m and 5.15m slabs in the reactor building of Unit 1 are completed
- The 2,500 m<sup>3</sup> concrete table that will support the turbine of Unit 1 is completed
- First liner ring (382 tons) lifted into the reactor building of Unit 2 in Q4 (see picture below)



## KEY ELEMENTS

- The project's targets in terms of schedule and cost at completion were updated on 27 January 2021 on the following basis:
  - The start of electricity generation of Unit 1 has been set at June 2026, compared to end-2025 as initially announced in 2016
  - The project completion costs are estimated at £<sub>2015</sub>22 to £<sub>2015</sub>23bn <sup>(1)</sup> corresponding to £26 to 27bn in current pounds
  - The risk of COD delay of Units 1 and 2 is estimated respectively at c.15 and 9 months. The probability of realisation of this risk is high
- The risks on the schedule and completion costs have increased in 2021 due to the continuing impact of Covid in 2021, lower than expected civil performance, tensions in global building materials markets and Brexit impacts. Plans are being developed to mitigate the delays and actions are in place to drive civil performance. At end-2021, the actual costs <sup>(2)</sup> for the whole project <sup>(3)</sup> stood at £15.3bn at nominal values (or £<sub>2015</sub>13.6bn). Due to the difficulties encountered by the project and the increase in risks, a new comprehensive review to update the costs and schedule estimates announced in January 2021 is underway and is expected to be finalised by summer 2022
- The agreements between EDF and CGN include a compensation mechanism between both shareholders in case of overrun of the initial budget or delays. This mechanism is applicable and will be triggered when the time comes. This arrangement is part of the agreements signed between EDF and CGN in September 2016 and is subject to a confidentiality clause.
- As the project's total financing needs exceed the contractual commitment of the shareholders (committed equity), shareholders will be asked to provide additional equity (voluntary equity) with an end date, estimate to date, at end-2023. This could lead the Group to increase its contribution to the project financing and to increase its stake (currently 66.5%) if its partner decided not to contribute to these additional equity commitments

(1) Costs net of operational action plans, excluding interim interest and at a reference exchange rate for the project of £1 = €1.23. Costs calculated by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index

(2) Excluding interim interest. The interim interest stand at €835m

(3) Costs calculated on the basis of a 2% inflation assumption for the construction period

# SIZEWELL C

## MAIN ASPECTS

- Project of **2 UK European Pressurised Reactors** (EPR) at Sizewell on the Suffolk coast for a total capacity of **3.2GW**
- Power supply to **6 million households** for around 60 years
- Replication as much as possible of the Hinkley Point C design and supply chain
- FID <sup>(1)</sup> subject to the conditions being met



(1) Final Investment Decision

(2) Announcement made on 27 October 2021 as part of the 2022-2025 UK government's spending review

## KEY ELEMENTS

### Key aspects of the project

- As of today, EDF's stake is 80% and CGN's is 20%.
- By the date of FID at the latest, EDF plans to reduce its stake to no more than 20%
- After FID, EDF group intends to supply the design, some key nuclear equipments and components as well as associated services

### UK government support for the development of nuclear projects <sup>(2)</sup>

- Up to £1.7 billion allocated to the development of large-scale nuclear projects over the period 2022-2025
- The UK government is in active negotiations with EDF on the Sizewell C project

### Regulation:

- Under a nuclear RAB (Regulated Asset Base) model, electricity suppliers would be charged, as the users of the electricity system, the cost of the project. This model aims to enable investors to share the project's construction and operating risks with consumers.
- The terms of the RAB model and a Government Support Package (GSP) are currently being discussed

### Financing until FID:

- EDF has planned to pre-finance development up to its share of an initial budget of £458M
- Ongoing discussions with the UK government on the financing of the remaining development costs until the FID
- In this context, the UK government has decided a £100 million government funding in January 2022 in exchange for an option over the site land or over EDF's shares in the project company.

**Development Consent Order** (DCO): Decision by the UK's Secretary of State expected by the end of May 2022

### Conditions for the FID:

- EDF's ability to participate in the FID alongside other investors depends on the fulfilment of some conditions including :
  - Sufficient funds to finance the development costs until FID
  - A regulation framework, risk-sharing mechanism and GSP allowing private investors (debt and equity) to invest
  - An appropriate financing structure during construction and operation and sufficient investors and debt holders willing to invest in the project. This is subject in particular to achieving an investment grade credit rating to attract private capital
  - An agreement with the key suppliers on the key contracts
  - Obtaining all the required consents and permits, including DCO
  - The ability not to consolidate the project in the Group's financial statements (including in the calculation of the economic indebtedness by the rating agencies) after the FID
- Not meeting these conditions could lead the Group not to take a FID

# JAITAPUR

Through the Jaitapur project, the EDF group has been involved in Franco-Indian civil nuclear cooperation since 2010 within the framework of bilateral agreements signed between France and India. It is directly based on the energy transition objectives of the Indian government, set out during the Paris Conference in 2015, which aim to drive forward the increased share of renewable and nuclear energies in the country. Jaitapur is in Maharashtra state and will be the largest nuclear power site in the world

Acting as head of the French nuclear power sector, EDF entered into exclusive negotiations with NPCIL in 2016



- In March 2018, EDF signed a non-binding industrial cooperation agreement (IFWA <sup>(1)</sup>) with Indian national electricity firm Nuclear Power Corp. of India Ltd. (NPCIL) for the construction of six EPR reactors in Jaitapur. This agreement sets out the industrial plan, the roles and responsibilities of partners, and the next steps of the project
- In this regard, the EDF group and its partners would supply all the studies and equipment for the nuclear island, the conventional island, the auxiliary systems, and the cooling source
- It is not expected that EDF will be an investor in the project

- In its capacity as the owner and future operator of the Jaitapur Nuclear Power Station, NPCIL is expected to be responsible for obtaining all authorisations and certifications required in India, and for constructing all six reactors and site infrastructures. EDF and its industrial partners would assist NPCIL during the construction phase
- In accordance with the IFWA <sup>(1)</sup>, EDF submitted a non-binding complete technical-commercial offer to NPCIL on 14 December 2018, and then a binding offer in April 2021
- Negotiations aiming at a signature of a GFA (General Framework Agreement) and allowing the project to start, are ongoing on this basis

(1) Industrial Way Forward Agreement



# TECHNICAL ISSUE AT THE TAISHAN EPR

## MAIN ASPECTS OF THE TAISHAN EPR

- EDF holds a 30% stake in TNPJVC<sup>(1)</sup>, which operates two EPR nuclear reactors (1,750MW each) in Taishan in the Guangdong Province
- The commercial commissioning of unit 1 was on 13 December 2018 and that of unit 2 on 7 September 2019. After their initial 18-month fuel cycle, each unit carried out its first “Initial Complete Visit” outage with reloading
- The 2021 output level was affected by the scheduled outage of unit 2 (first complete visit) and the unplanned outage of the unit 1 for five months owing to a technical issue



## TECHNICAL ISSUE: FEEDBACK

- Atypical evolution of radiochemical parameters, leading to suspicion that fuel assembly rods had become unsealed <sup>(2)</sup>
- Shutdown of reactor 1 and defueling operations in August 2021
- According to investigations on the fuel assemblies, the loss of sealing would be due to a deterioration of the rod cladding owing to mechanical wear stemming from the rupture of small rod hold-down systems in the assemblies <sup>(3)</sup>
- After an investigation by the competent authorities, this review could, eventually, result in adjustments to the manufacturing process and the implementation of a different technology to hold the rods in place in the assemblies
- Inspections of the assemblies and the interior of the vessel have also revealed a localised phenomenon between the assemblies and a component covering the core related to hydraulic exposure. Studies are underway to determine arrangements to reduce interactions between the assemblies and the core barrel
- An analysis concerning the other EPR projects is ongoing

(1) Taishan Nuclear Power Joint Venture Company Limited

(2) See the 14 June 2021 and 22 July 2021 press releases

(3) See 12 January 2022 press release

# NEW NUCLEAR: SMR (SMALL MODULAR REACTOR) NUWARD™ PROJECT

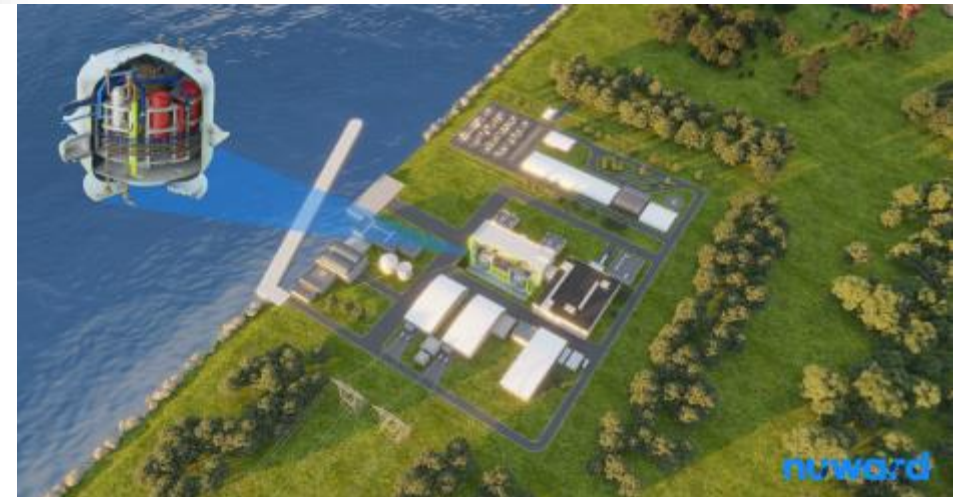
## PROJECT

- Development of NUWARD™, a small modular reactor (SMR), in technical partnership with CEA, Naval Group and TechnicAtom
- Nuclear plant of two pressurized water reactors (PWR) of 170MWh each



## PROGRESS AND COSTS

- Currently in the « Conceptual Design » phase (setting main design options and starting to size main systems and components)
- The French State has granted €50m of subsidies to the Nuward project in December 2020 as part of the recovery plan “Plan de relance”. Additional support of €500 million was announced by the French President in February 2022





# EUROPEAN PRESSURISED REACTOR 2 (EPR2)

## MAIN ASPECTS OF THE PROJECT

- **A nuclear reactor with the same strengths as the EPR:** the same security level (one of the highest in the world) and the same power and environmental performance, etc.
- **Fully integrating feedback** from all EPR sites worldwide and the fleet in operation
- **Designed to be operated as part of a mix with a substantial renewable energy component** by 2040 through management flexibility (manoeuvrability).
- **In a programme of three pairs of reactors (six EPR2s)** to benefit from volume effects in technological terms, notably in equipment purchasing and construction-phase services, as well as later in operation and maintenance.
- **Electrical power of an EPR nuclear power station:** 1,670MW

## FINANCIAL ASPECTS

Planned overall cost for a programme of six EPR2s: around €50bn<sub>2020</sub>

## SCHEDULE PROPOSED BY EDF

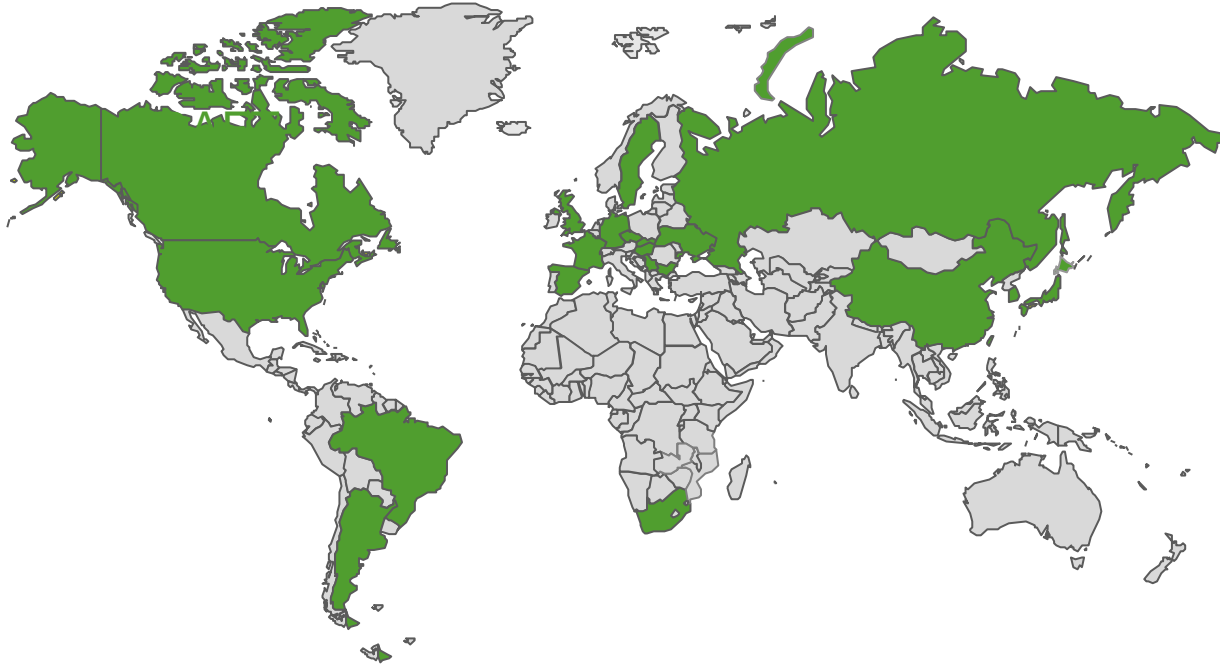
- Proposal by EDF and nuclear sector for an execution programme presented to the French government in May 2021
- The construction schedule proposed by EDF and the nuclear sector is based on one pair of EPR2s every four years, with 18 months between each production unit of the same pair
- The first pair of reactors, at Penly, is scheduled to be commissioned between 2035 and 2037

## 1.670MW EPR2 power plant



# FRAMATOME, A MAJOR INTERNATIONAL PLAYER IN THE NUCLEAR INDUSTRY

## An international presence



€3.4bn  
in sales <sup>(1)</sup>

€3.7bn  
backlog <sup>(1)</sup>

More than  
60  
sites in  
20  
countries <sup>(1)</sup>

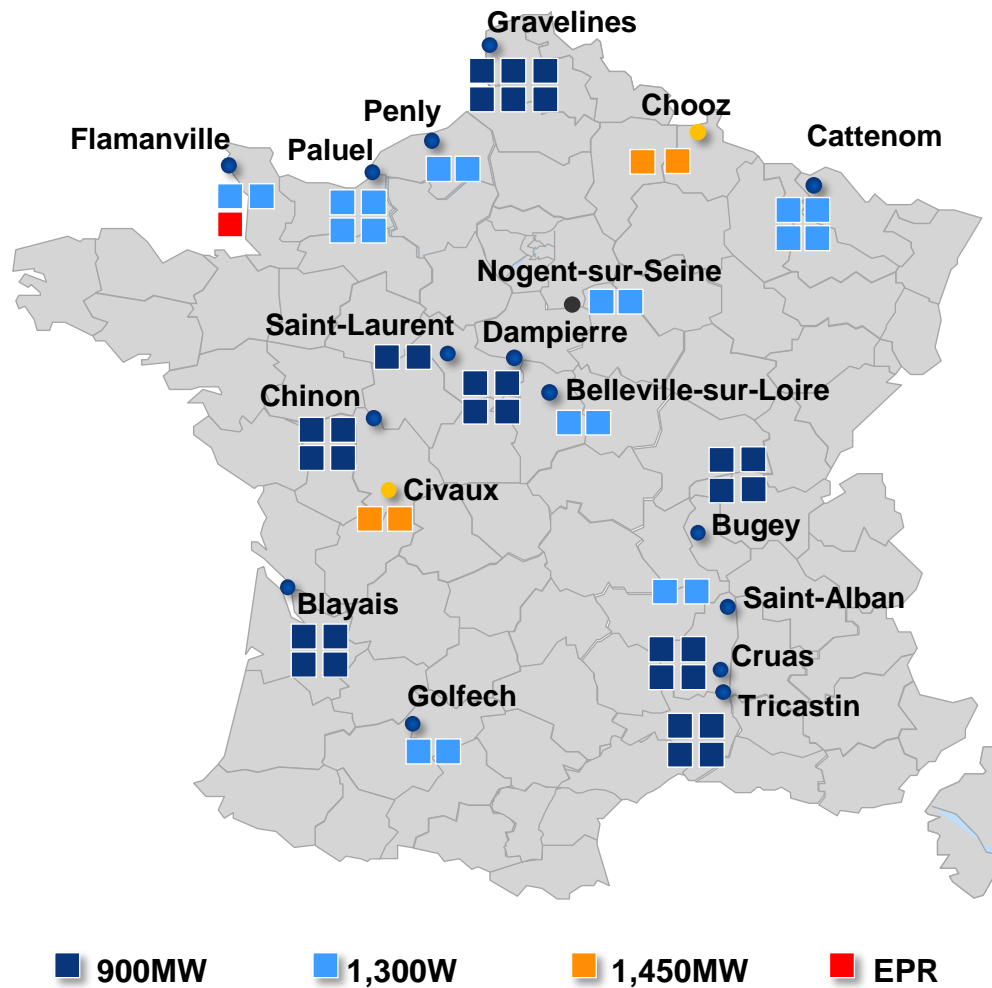
More than  
15,000  
employees <sup>(1)</sup>

(1) Data at the end of 2021

## Benchmark supplier in the nuclear industry

- Designer and supplier of nuclear steam supply system and nuclear equipment, services, fuel and control systems for high levels of safety and performance
- **Management of major nuclear projects:** management and implementation of reactor construction projects and replacement of major components
- **Engineering, licensing and R&D:** development, design and licensing of boilers and associated services. Research and development on future reactors
- **Equipment manufacturing:** manufacturing plants for heavy and mobile components of the nuclear island (vessel, piping, steam generators,...)
- **Instrumentation and control:** design and manufacture of instrumentation and safety control systems for nuclear power plants
- **Nuclear fuel design and supply:** development, design, licensing and manufacturing of fuel assemblies and components for all types of reactors (PWR, VVER, BWR and research reactors).
- **Services activity:** solutions for the maintenance, modernisation, life extension and cyber security of reactors in operation and under construction. Decommissioning activities.

# EDF NUCLEAR FLEET IN FRANCE



- **68.9%**<sup>(1)</sup> of French power generation in 2021
- **56 reactors** in operation with a capacity of **61,370 MW**
- **18 sites**
- A unique technology, PWR (Pressurised Water Reactors), 3 series:
  - 900MW **32 reactors** 29GW with an average age of 39 years
  - 1,300MW **20 reactors** 26GW with an average age of 33 years
  - 1,450MW **4 reactors** 6GW with an average age of 21 years

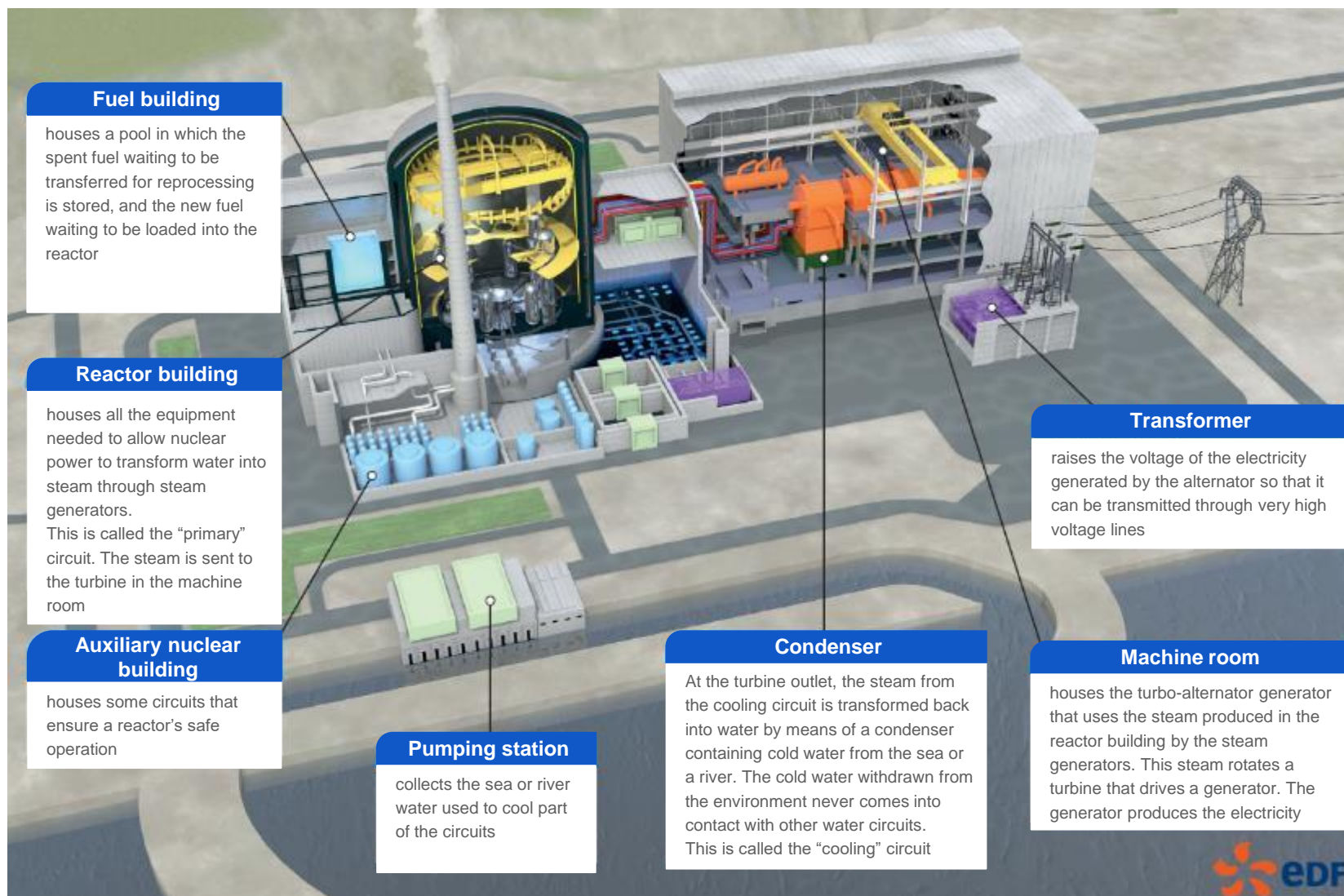
## Did you know ?

The whole fleet in operation today has been built using the same technology (PWR). This standardisation allows for operational synergies and greater efficiency.

EDF is responsible for the design, building and operation of the reactors and considers the safety of its facilities as an absolute priority

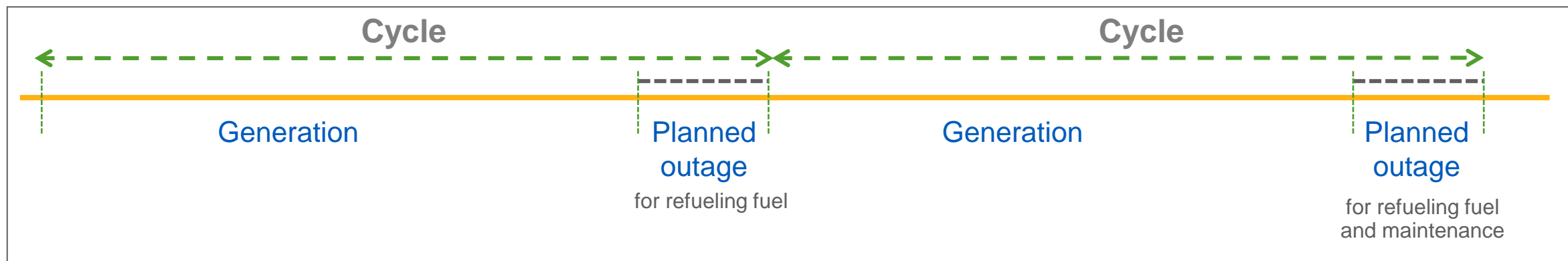
(1) The total French electricity output reached 522.9TWh in 2021 (Bilan électrique 2021 of RTE)

# OPERATING PRINCIPLES OF A PRESSURISED WATER REACTOR (PWR)



Nuclear power plant without air cooling

# THE FRENCH NUCLEAR FLEET: OPERATING CYCLE



## The outages cycle of nuclear reactors

- 900MW: **28 reactors** 12 months cycle  
**4 reactors** 18 months cycle
- 1,300MW: **20 reactors** 18 months cycle
- 1,450MW: **4 reactors** 18 months cycle

## Types of planned outages

- Two types of planned outages are alternated at the end of each generation campaign:
  - Ordinary outage for refueling only (PWR): mainly unloading spent fuel and refueling fresh fuel. **Standard period ~40 days <sup>(1)</sup>**
  - Partial inspection: refueling and maintenance **Standard period ~85 days <sup>(1)</sup>**, varying according to programs for maintenance work
- 10-year inspections: **standard period ~180 days <sup>(1)</sup>**, varying according to programs for safety upgrades and maintenance work
  - Detailed examination of the main components relating to the safety of the facility (reactor vessel, containment building) and realisation of the upgrades aimed to reinforce the safety level of the facility

(1) In February 2020, EDF revised upwards its forecast outage durations to take into account the industrial reality observed over the 2016-2019 period

# HISTORICAL AVAILABILITY OF THE FRENCH NUCLEAR FLEET

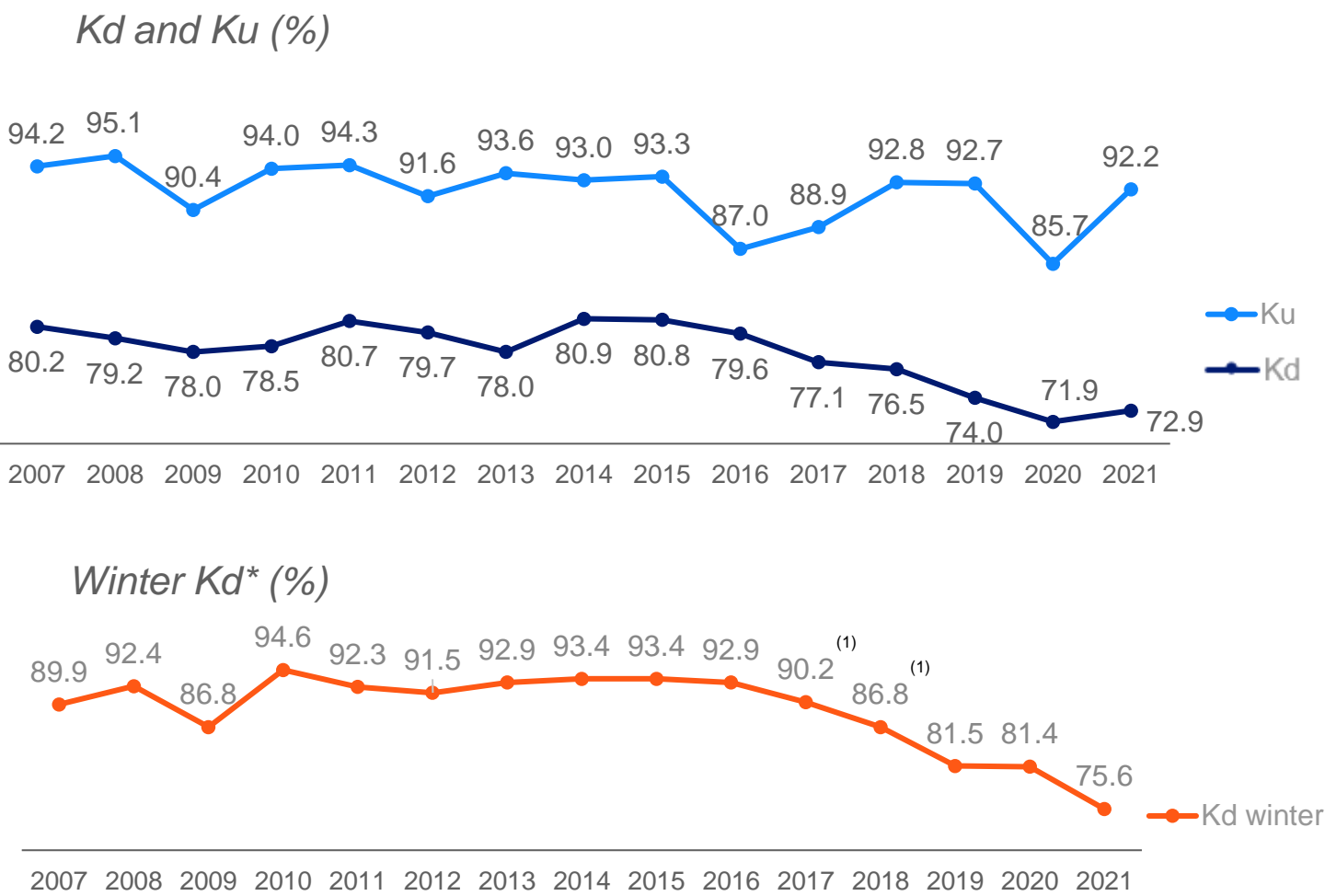
### Did you know ?

The **Kd**, or “availability factor”, represents the available energy over the maximum theoretical energy corresponding to the maximum capacity all along the year. The winter **Kd** is the availability factor measured between the 1<sup>st</sup> of December and the 14<sup>th</sup> of February of the next year, when the consumption reaches its maximum levels.

The **Ku**, or “utilisation factor”, is the produced energy over the available energy. It reflects environmental, social and regulatory constraints, the consumption profile of customers, the supply of system services and the optimisation

**$Kp = Kd \times Ku$**

The multiplication of the Kd and the Ku leads to the **Kp**, or “load factor”, defined as the generated energy compared to the maximum theoretical energy



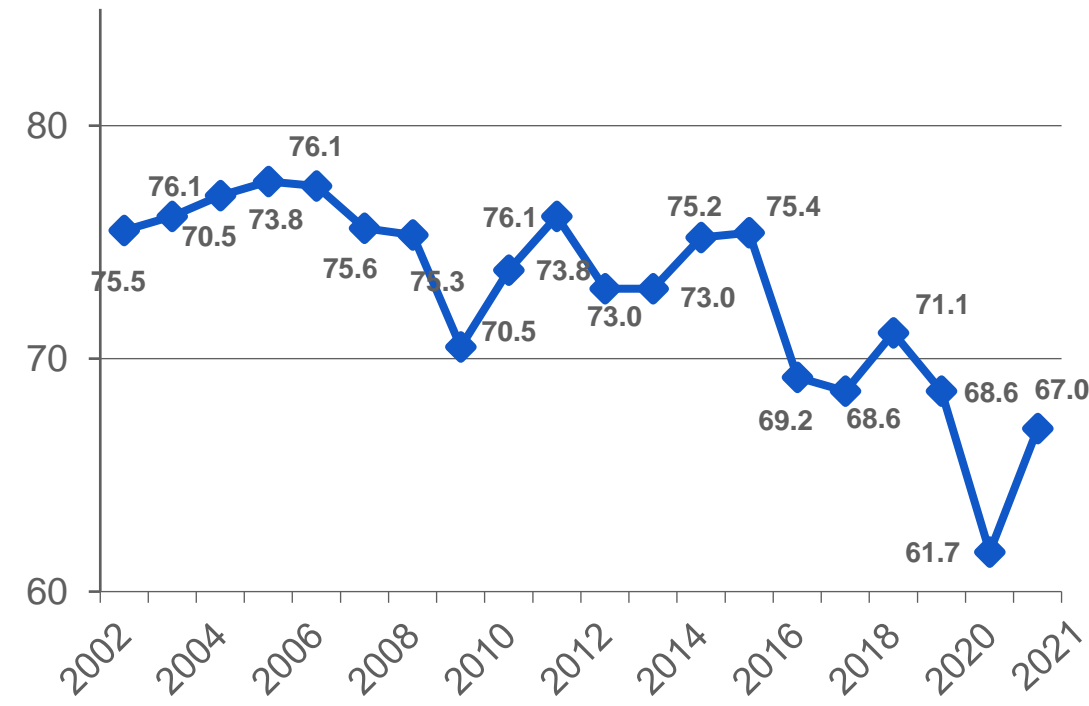
(\*) from 1st December (N) to 14 February (N+1)  
(1) Excluding the outages for regulatory reasons such as outages relating to the irregularities found at Creusot factory, that are included in Ku factor



# CHANGE IN LOAD FACTOR AND NUCLEAR OUTPUT IN FRANCE

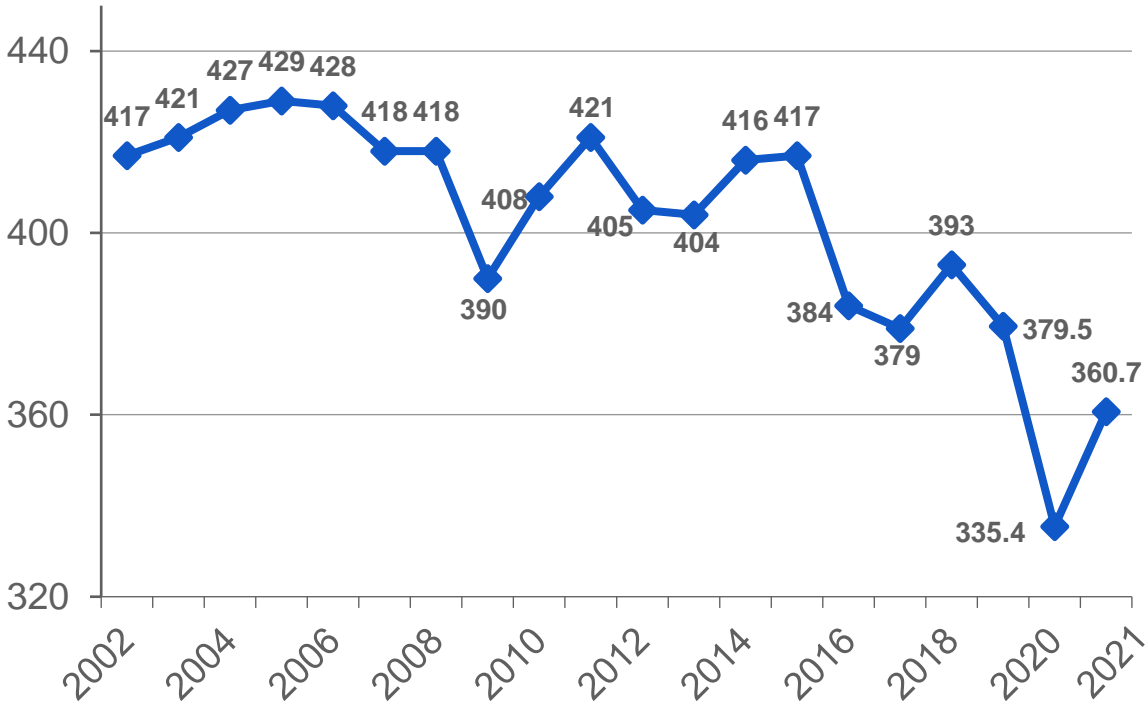
Annual load factor of nuclear fleet in France

Load factor (%)



Net output of PWR <sup>(1)</sup> fleet in France

TWh



(1) Pressurized Water Reactor

# EXISTING NUCLEAR FLEET AND THE *GRAND CARÉNAGE* PROGRAMME

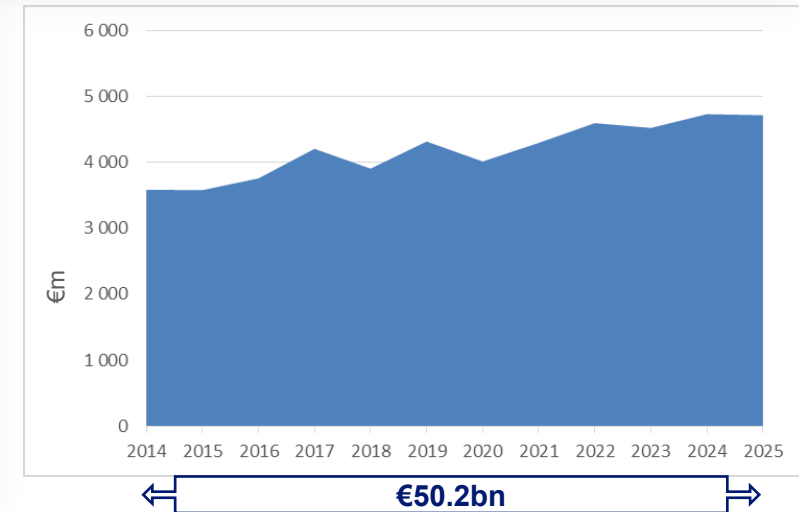
## INDUSTRIAL STRATEGY

Industrial strategy to continue the operation of plants after 40 years:

- Technical capacity of the plants to operate beyond 40 years supported by international benchmarks for similar technologies
- Extension from 40 to 50 years of the depreciation period of the 900MW nuclear fleet (except Fessenheim) from 1 January 2016: 5 reactors successfully completed their 4th ten-year inspection and thus passed the 40-year milestone (Tricastin 1, Tricastin 2, Bugey 2 and Bugey 4 et Dampierre 1) and 2 ten-year inspection are ongoing (Bugey 5 and Gravelines 1)
- Extension from 40 to 50 years of the depreciation period for the 1,300MW nuclear fleet from 1 January 2021, following in particular, the ASN's decision of 23 February 2021 on the conditions for continued operation of the 900MW reactors for the ten years following their fourth 10-year inspection and the success of the first 4<sup>th</sup> ten-year inspection on Tricastin 1
- Strategy compatible with multi-year energy programme for France (PPE)

## "GRAND CARÉNAGE" PROGRAMME

- Programme integrating the quasi totality of the investments in the existing nuclear fleet over the 2014-2025 period, and beyond
- The estimated cost of the programme is regularly updated. In 2015, initial investment programme on the 2014-2025 period was estimated at €<sub>2013</sub>55bn <sup>(1)</sup> and was optimised and revised to €<sub>2013</sub>45bn (€48.2bn in current euros) in 2018. In 2020 <sup>(2)</sup>, EDF has adjusted the costs of the programme to €49.4bn in current euros.
- To date, the cost stands at €50.2bn in current euros including the new requirements (excluding repair work that could become necessary in respect of the stress corrosion phenomena <sup>(3)</sup> )
- The new roadmap of the "Grand Carénage" project beyond 2025, taking into account in particular the costs related to the fifth 10-year inspection of the 900MW nuclear fleet, is in progress

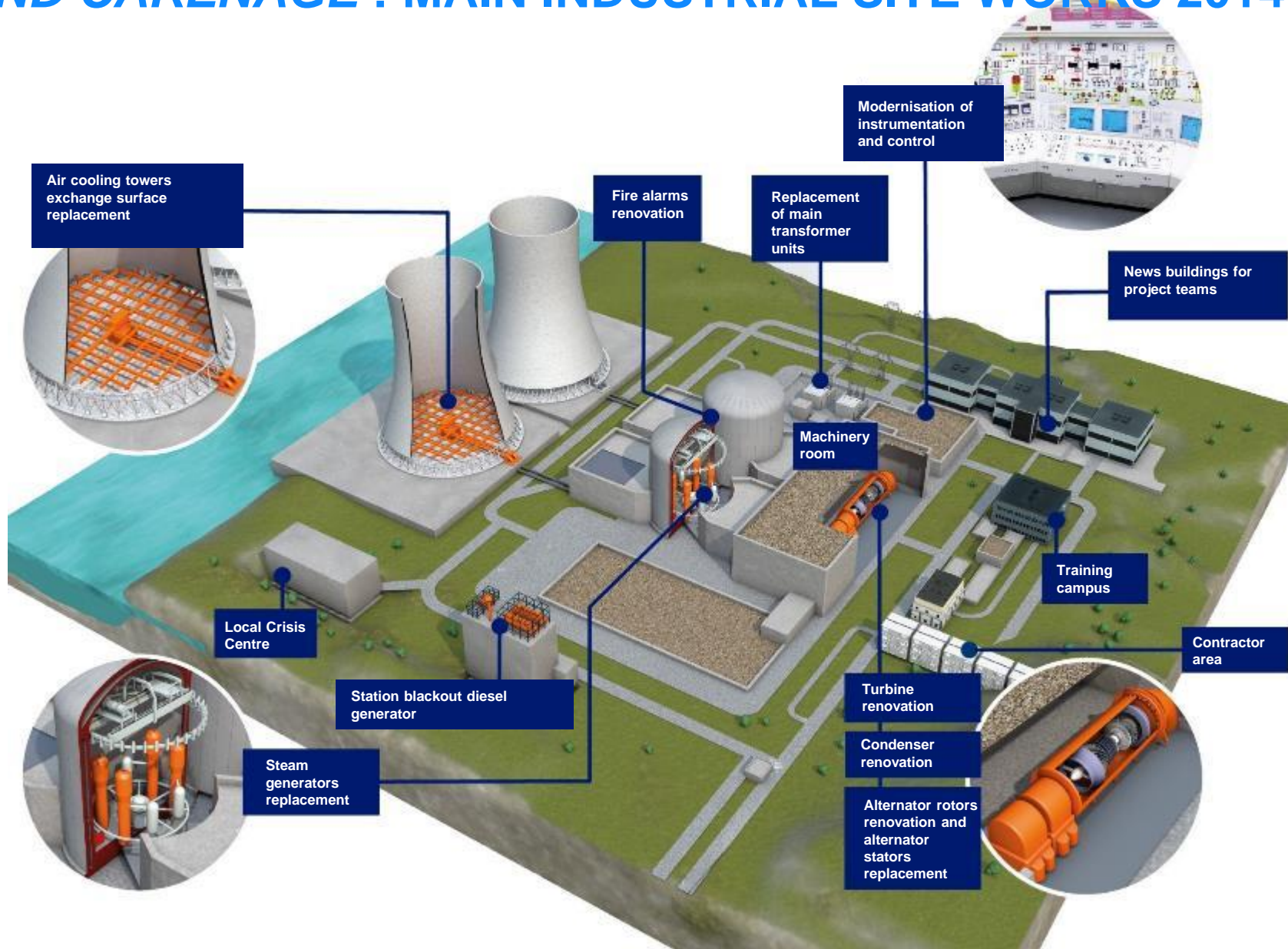


(1) The figures presented by the French Cour des comptes in its report of 10 February 2016 cover a longer time horizon, up to 2030, and included, beyond the investment, operating and maintenance expenses. Both assessments are consistent, as stated by the Cour des comptes in its report. Indeed, among the overall estimates calculated by the Cour des comptes and amounting to close to €<sub>2013</sub>100 billion for the 2014-2030 period, the investment-expenditures estimated at €<sub>2013</sub>74.73 billion should be distinguished from the operating expenditures estimated at €<sub>2013</sub>25.16 billion. Within the €<sub>2013</sub>74.73 billion of investment expenses between 2014 and 2030, €<sub>2013</sub>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

(2) See press release of the 29 October 2020

(3) See press release of the 15/12/2021, 13/01/2022 and 07/02/2022

# GRAND CARÉNAGE : MAIN INDUSTRIAL SITE WORKS 2014-2025



- As a major industrial program, Grand carénage incorporates all the investments made by EDF on its French nuclear fleet. It is now made up of 16 active projects
- Each project covers the design and construction phases of all EDF nuclear power plants



# SOME LARGE PROJECTS 2021

## Fourth ten-year visit 900

Five fourth ten-year visit outages in 2021, with no major incidents relating to fourth ten-year visit works: Bugey 4 was coupled to the grid on 24/06/2021, Tricastin 2 on 26/07/2021 and Dampierre 1 on 05/02/2022. The outages of the fourth ten-year visits of Bugey 5 and Gravelines 1, launched in 2021, continued in 2022.

The pace of five fourth ten-year visits per year will continue in 2022 (GRA3, TRI3, DAM2, BLA1, SLB2): the activities completed ahead of time in 2021 to prepare for these five fourth ten-year visits advanced in line with the schedule.



## MRI

Compliance with regulatory deadline of 03/12/2021 on the removal of ionic detectors from all industrial and tertiary buildings at all nuclear power plants.

## UWS

At end-2021, 56 out of 56 units were equipped with an “ultimate water source”, either with a long-term solution or a temporary solution (37). The long-term solutions will be rolled out in 2022 and 2023.

## Third ten-year visit 1300

The third ten-year visit of Cattenom 3 was completed on 03/09/2021 with difficulties regarding the modification of the turbine command control.

The third ten-year visit of Penly 1 was also initiated in 2021.



Closure of the third regular re-examination 1300: ASN sent the letter on the closure of the general phase of the third regular 1300 re-examination to EDF on 07/07/2021. It included 16 additional requests.

## Steam generator

- Replacement of SGs at Gravelines 6: last replacement SG assembly phase completed on 20 February 2022
- Flamanville 1: Arrival on site of the replacement SGs for the RGV of Flamanville 1 2022
- Completion of the preventive cleaning of the 3 SGs in 2021 and qualification of new Framatome procedure for preventive cleaning.



## Second ten-year visit N4

Start of the outage for the second ten-year visit of Civaux 1 on 21/08/2021. A total of 43 modifications will be included, mainly concerning command control, six of which in TTS. 97% of the TEM works were completed before the unit was decoupled.

## PRS

The first biometric gate was successfully installed at the Flamanville site.

## Civil engineering

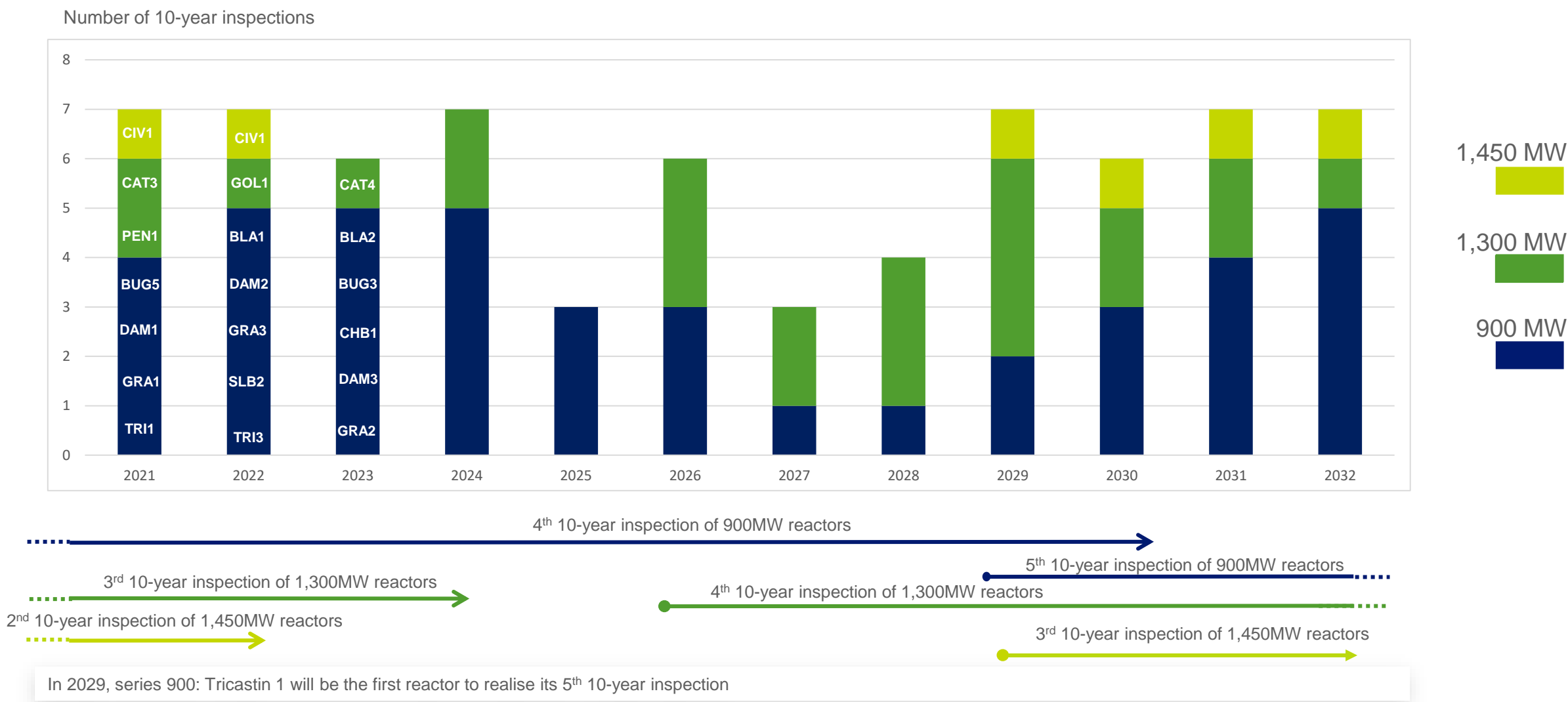
POCO Extrados project at Cattenom 3: the use of an access structure specifically designed and implemented to place 2,000 m2 of cladding on the dome served to secure production rates by optimising phasing and to ensure optimal production quality and thus substantially improve dome sealing.



## Cooling source

The rotating drum screens at Tricastin 2, Penly 1 and Gravelines 1 were replaced on schedule.

# 10-YEAR INSPECTIONS OF THE NUCLEAR FLEET



NB: forecast data on 31 December 2021



# EXTENSION OF AMORTISATION PERIOD FOR 1,300MW NUCLEAR FLEET

The Group considers that all the technical, economic and governance conditions for bringing the depreciation period of 1300MW-series PWR plants in France in line with its industrial strategy were fulfilled during 2021

## CHANGE IN ACCOUNTING ESTIMATE

The Group has a sufficient level of assurance the technical capacity of the 1300MW plants' to operate for at least 50 years. This is also confirmed by the international benchmark

The ASN decision published in February 2021 for the generic aspects of the conditions for continued operation of the 900MW reactors for a ten years following their fourth 10-year inspection, and the industrial success of the initial fourth 10-year inspection for such reactors of the 900MW nuclear fleet <sup>(1)</sup> reinforce EDF's confidence that its inspection content for 1,300MW series is appropriate and well controlled. Once its fourth 10-year inspections are completed, the 1,300MW PWR plants will thus have reached a level of safety similar to EPR safety level

Also, extending operation of the 1,300MW-series plants beyond 40 years offers high profitability even in low long-term price scenarios, and in a range of sensitivity scenarios

Finally, operating the 1,300MW-series plants for 50 years is consistent with France's Energy and Climate law of 8 November 2019 and the adoption decree of 21 April 2020 for France's multi-year energy plan (*Programmation Pluriannuelle de l'Energie* (PPE))

The Group considers that the best estimate for the depreciation period of the 1,300MWe-series plants is now 50 years. This change in accounting estimate is independent of the ASN's decisions to authorize conditions for continued operation. In compliance with the law, such authorisations will be given by the ASN individually for each unit after each 10-year inspection

The Group therefore changed the accounting estimate at 1 January 2021 for all 1,300MW power plants

## IMPACTS ON 2021 FINANCIAL STATEMENTS

This change of accounting estimate, which is applied on a prospective basis, essentially results in reduced asset depreciation expenses and costs to unwind the discount on provisions in the Group's financial statements

in €bn	30/06/2021	31/12/2021
Net depreciation and amortisation and discount expenses	0.3	0.6
Income before taxes of consolidated companies	0.3	0.6
Net income – Group share	0.2	0.4

At 1 January 2021, provisions relating to nuclear power generation were reduced by €1bn, including €0.8bn covered by dedicated assets. This reduction generated a tax payment of €184 million

NB: see notes 1.3.4 and 1.4.1 to the consolidated financial statements at 31 December 2021

# THE PLANT DISMANTLING CYCLE: 3 KEY STEPS



## Final shutdown

- The first phase consists in unloading the fuel and draining all systems (after which 99.9% of the on-site radioactivity has been eliminated), followed by decommissioning (dismantling of decommissioned non-nuclear installations)

## Dismantling excluding the reactor building

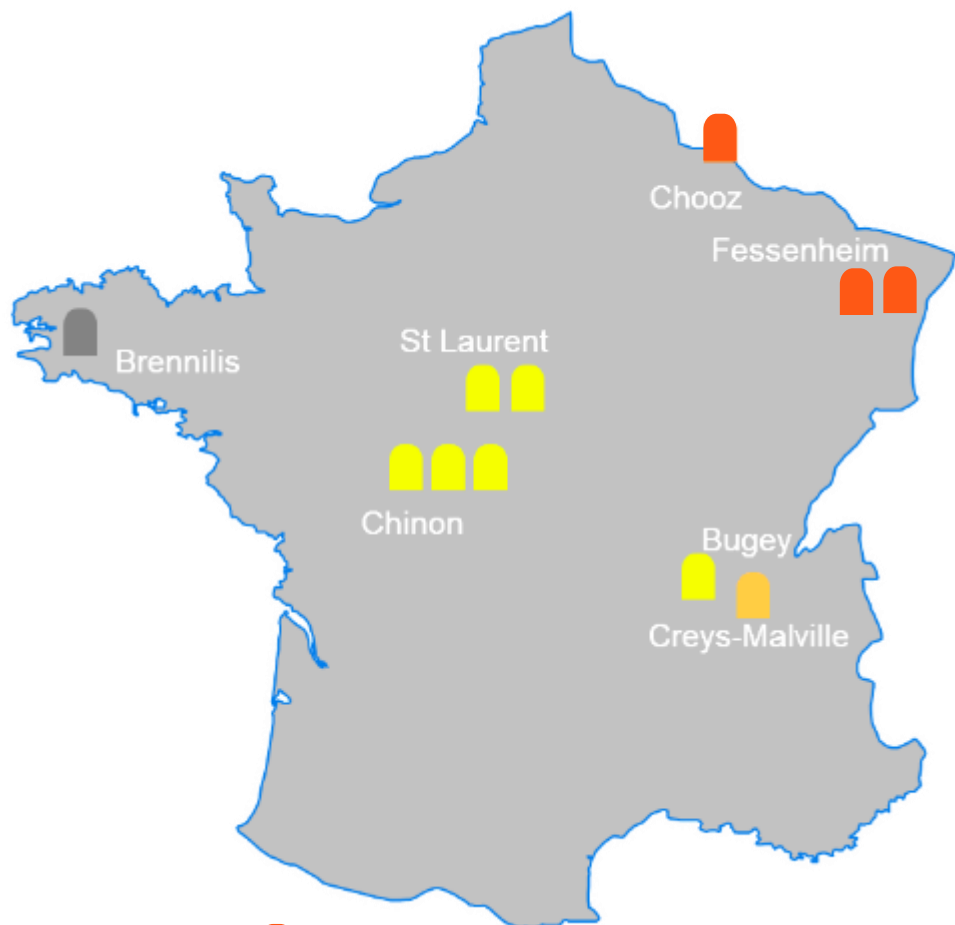
- The second phase starts after the obtaining of the dismantling decree and consists in dismantling all equipment and buildings (with the exception of the reactor building), as well as the packing and removing of all waste to appropriate storage facilities





## Dismantling of the reactor building

- This final phase corresponds to dismantling of the reactor vessel, the demolition of the buildings and the soil remediation

The duration of a Pressurised Water Reactor (PWR) dismantling is 15 years starting from the dismantling decree. The duration of the operations may vary for other technologies (NUGG, LWR, FNR) according to the complexity of works that have to be completed

# DISMANTLING: A NORMAL STEP IN THE LIFE OF A PLANT



-  Pressurized Water Reactor
-  Graphite Reactor
-  Heavy Water Reactor
-  Fast Reactor

## 3 periods in the life of a plant

### Construction - Operation - Dismantling

As the operator of the nuclear plants, EDF is in charge of these three steps and is currently dismantling first generation nuclear plants (shut down up to the 1990s) and prepares the dismantling of the two reactors of Fessenheim.

11

REACTORS UNDER  
DISMANTLING IN  
FRANCE

4

DIFFERENT  
TECHNOLOGIES

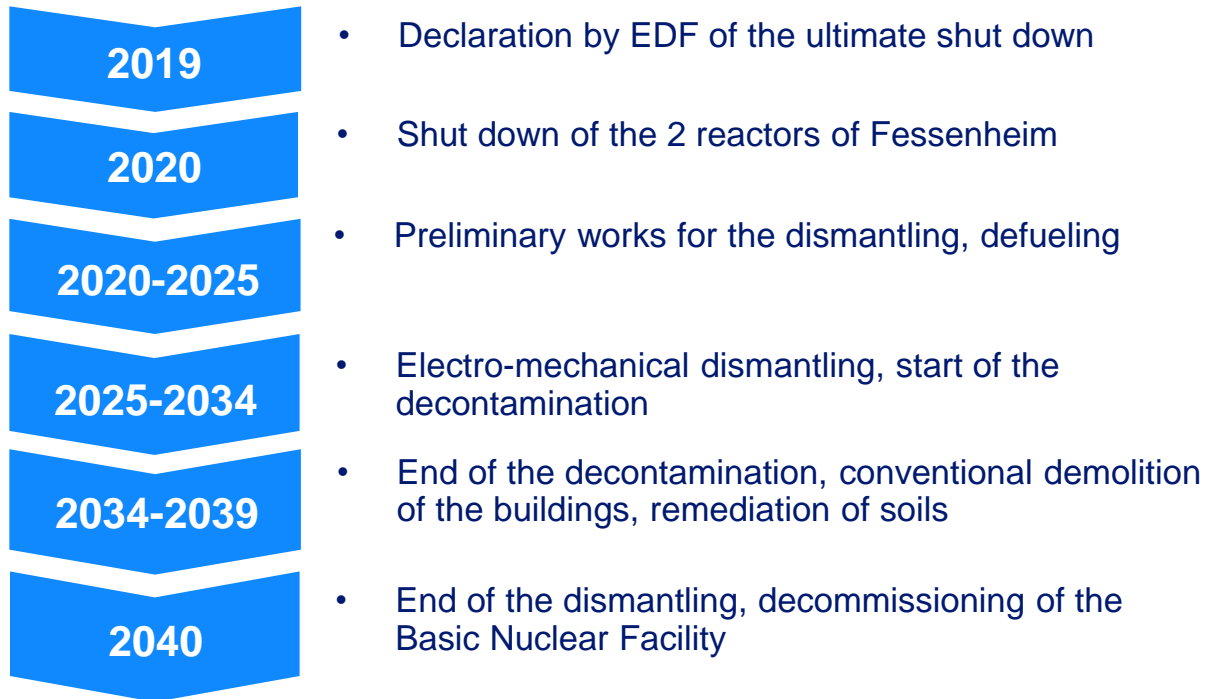
7

INDUSTRIAL SITES

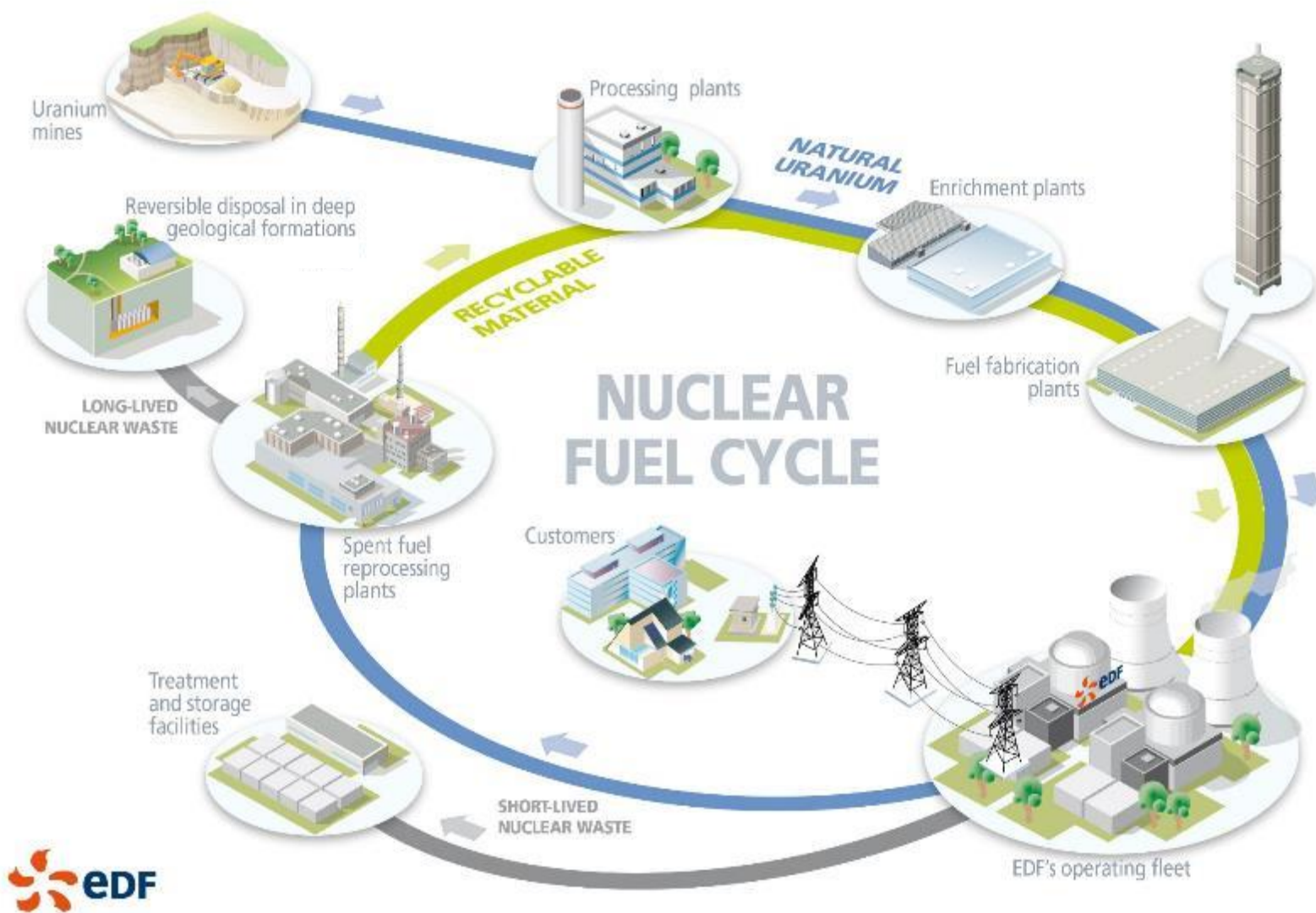
*The nuclear plants currently in operation are all "Pressurized Water Reactors" (PWR)*

# PREPARATION OF THE DECOMMISSIONING OF THE 2 FESSENHEIM REACTORS

Commissioned in 1977, the 2 reactors of FESSENHEIM were shut down in February and June 2020. In December 2020, EDF submitted its decommissioning file including an environmental impact assessment and a safety demonstration. The dismantling decree authorising the start of dismantling work of the plant is expected in 2025, after the ASN investigation.



# STAGES OF THE NUCLEAR FUEL CYCLE IN FRANCE





# RADIOACTIVE WASTE MANAGEMENT (1/2)

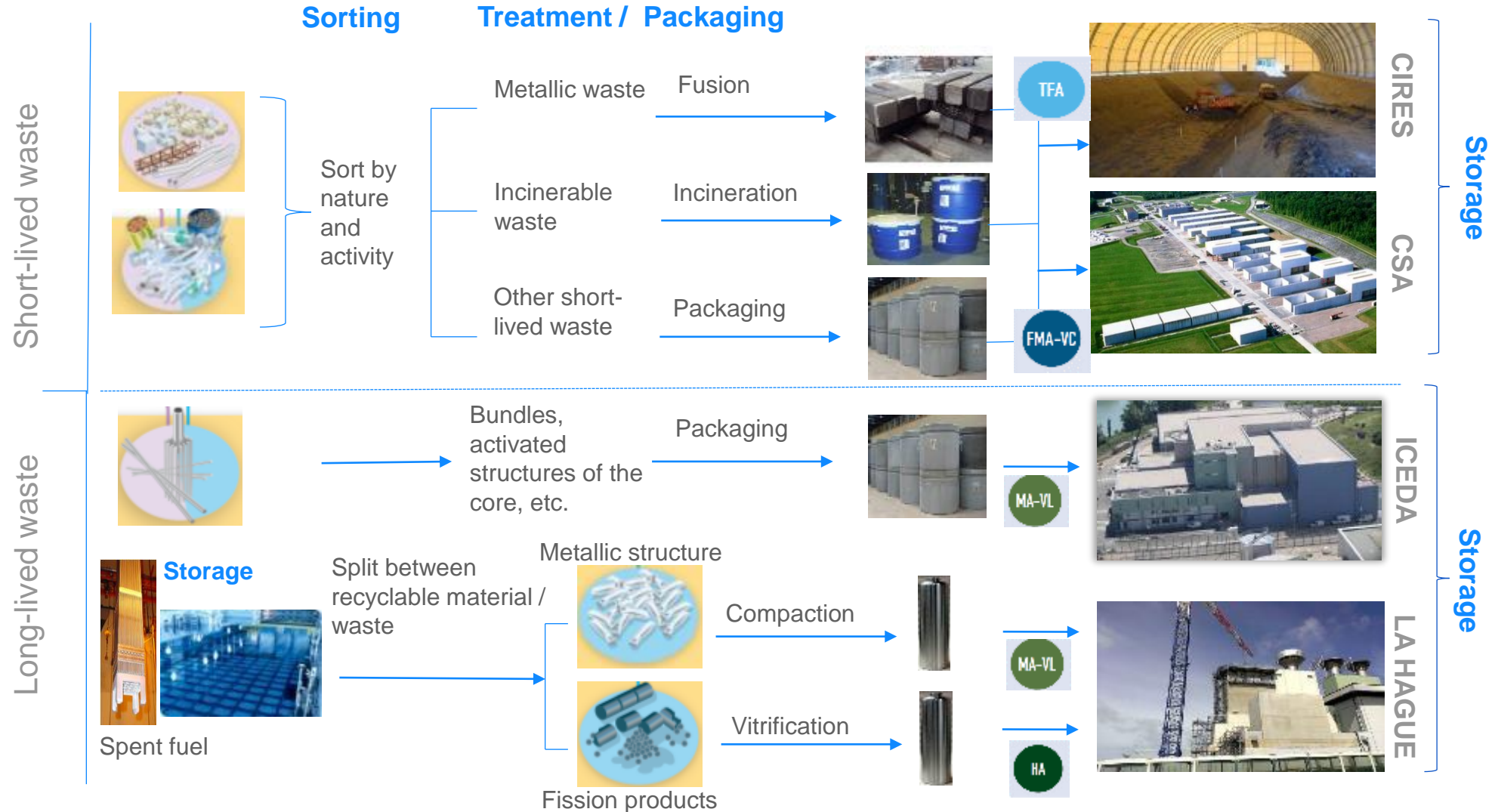
	TYPE OF WASTE	EXAMPLE	POSITION/STORAGE
<b>SHORT-LIVED WASTE</b> Their radioactivity is halved over a period of 31 years or below 90% of waste 0.1% of radioactivity	<b>VERY-LOW-LEVEL WASTE (VLLW)</b>	Waste resulting from the maintenance work and decommissioning of nuclear installations (concrete, scrap, piping, work clothes, ...)	On the surface at the Morvilliers storage centre managed by ANDRA <sup>(1)</sup>
	<b>SHORT-LIVED INTERMEDIATE- AND LOW-LEVEL WASTE (SL-ILW and -LLW)</b>	Waste from the processing of liquid and gaseous effluents of operating plants; some decommissioning waste	On the surface at the Soullaines storage centre, managed by ANDRA <sup>(1)</sup>
<b>LONG-LIVED WASTE</b> Their radioactivity is halved over a period of more than 31 years 10% of waste 99.9% of radioactivity	<b>LONG-LIVED, LOW-LEVEL WASTE (LL-LLW)</b>	They essentially are graphite waste from the dismantling of first-generation plants	Warehousing at the production site pending the construction of a storage centre. Storage project under review.
	<b>LONG-LIVED INTERMEDIATE-LEVEL WASTE (LL-ILW)</b>	Metallic structures of the fuel assemblies, other operating or dismantling waste near the core of the reactor	Once the fuel is removed, the metallic structures enclosing the fuel are warehoused at the plant in The Hague. Operational and dismantling waste close to the core are sent to ICEDA since October 2020 (commissioning), pending the geological storage industrial centre (Cigéo) <sup>(2)</sup>
	<b>HIGH-LEVEL WASTE (HLW)</b>	Waste from the processing of spent fuel	Warehousing at the Orano site in The Hague pending the geological storage industrial centre (Cigéo) <sup>(2)</sup> .

(1) National Agency for Radioactive Waste Management (Agence Nationale pour la Gestion des Déchets Radioactifs)

(2) For more information about [Cigéo](#), please see p.108

# RADIOACTIVE WASTE MANAGEMENT (2/2)

100% OF RADIOACTIVE WASTE IS MANAGED IN OPERATIONAL AND SAFE STRUCTURES



# CIGÉO – A DEEP-STORAGE INDUSTRIAL CENTRE

- French deep-storage project for Long-lived Intermediate-level and High-level radioactive waste, generated mainly by the existing French nuclear facilities (nuclear power industry, research, defense, etc.). Such waste represents 3% of the total volume of radioactive waste and is alone responsible for 99% of waste radioactivity
- The French law of 28 June 2006 tasked the National Agency for Radioactive Waste Management (ANDRA) with designing, constructing and operating Cigéo
- The authorisation request of the Cigéo creation will be submitted in Q3 2022. It plans the site to be located in eastern France, on the border between the Meuse and Haute-Marne, near the ANDRA underground laboratory (Bure)

## The principle of reversible storage in deep geological layers

- Principle adopted by the French Law of 28 June 2006 as the only safe solution for the long-term management of this type of waste, without shifting the burden onto future generations. This choice was preceded by 15 years of research, assessments (including the National Review Board and the Nuclear Safety Authority) and a public debate
- The principle of reversibility for the entire duration of the operation (at least 100 years) in order to adapt Cigéo to possible changes

## Secure and robust facilities that are adaptable on two levels

- On the surface: facilities to receive and prepare waste shipments, and to undertake excavation work and the progressive construction of underground structures
- Below ground: galleries located about 500 meters deep in a stable and impermeable layer of argillaceous rock, chosen for its containment properties over very long periods
- Scalable architecture of the underground facilities during operation, depending on feedback and available technologies



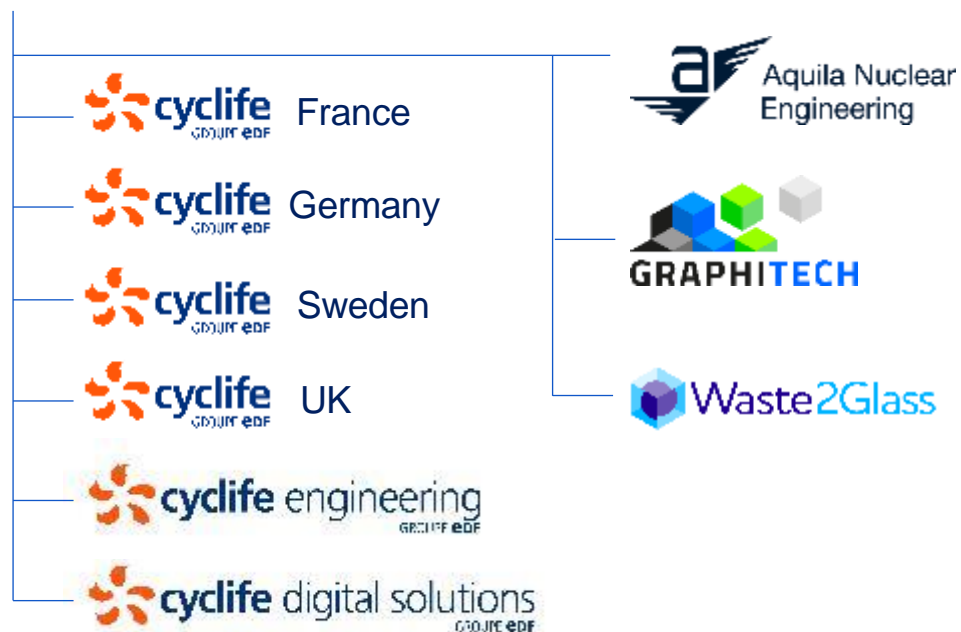
Cigéo facilities on the surface



Cigéo underground galleries modelisation

# CYCLIFE: A GROUP OF SUBSIDIARIES DEDICATED TO DECOMMISSIONING AND RADIOACTIVE WASTE TREATMENT OFFERINGS

- The Group of subsidiaries “**Cyclife**” was created to centralise the Group’s activities on nuclear decommissioning and waste treatment for the French and international market.
- The Group consists of several entities or subsidiaries



## EDF radioactive waste treatment facilities <sup>(1)</sup>

### UK (Workington)

Metal waste treatment  
(clean up, cutout) <sup>(1)</sup>:  
3,000t/year

~ 120 employees

### Sweden (Nyköping)

Smelting <sup>(1)</sup>: 5,000t/year  
Incineration <sup>(1)</sup>: 500t/year  
Pyrolysis <sup>(1)</sup>: 50t/year

~ 100 employees

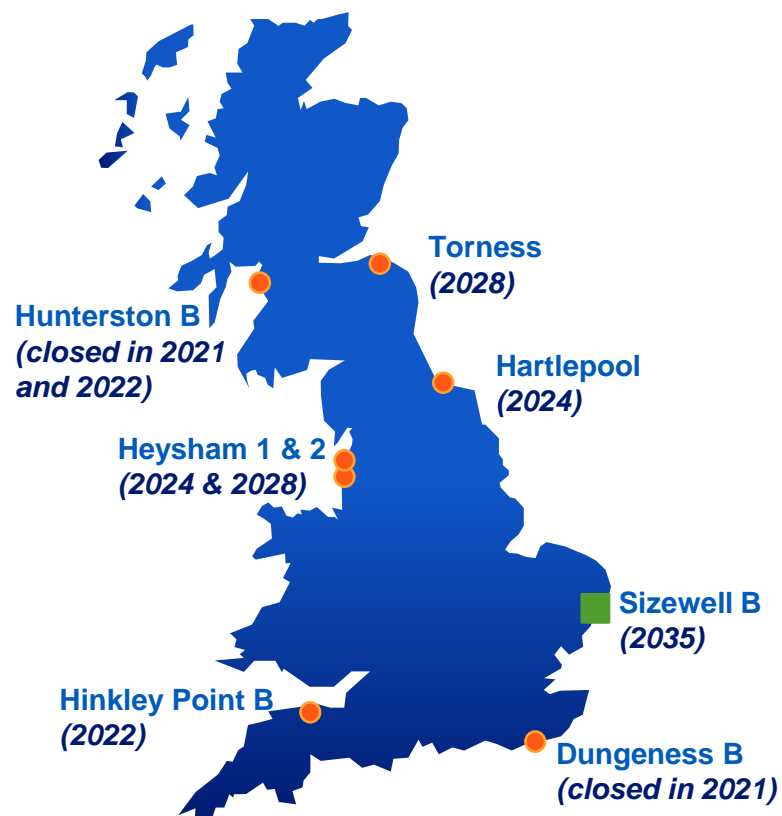
### France (Codolet)

Smelting <sup>(1)</sup>: 3,500t/year  
Incineration <sup>(1)</sup>: 6,000t/year

~ 300 employees

(1) Maximum authorised capacities

# EDF ENERGY NUCLEAR FLEET



● Advanced Gas-cooled Reactor (AGR)

■ Pressurised Water Reactor (PWR)

(2022) Planned closure date

## HIGHLIGHTS

- Generated approximately **15% of UK output in 2021** <sup>(1)</sup>
- **7 nuclear power** stations
- **13 reactors** in operation
- **2 technologies** (AGR and PWR), with total capacity of **7.8GW** <sup>(2)</sup>

## Did you know ?

**An AGR** differs in many respects from a PWR. Whereas the AGR design is unique to the UK, the PWR design is the most common reactor type in the world.

**An AGR** has a graphite moderator helping to control the reaction. The reactor is encased in a steel-lined pre-stressed concrete pressure vessel several meters thick which also acts as a biological shield. The steam generator in which water is heated is situated inside the pressure vessel. An AGR uses enriched uranium dioxide encased in a stainless steel pin for its fuel and CO<sub>2</sub> as its coolant.

**A PWR** is contained inside a steel pressure vessel filled with pressurised water which acts as the moderator and coolant. The fuel used is enriched uranium dioxide and is contained in zirconium alloy tubes.

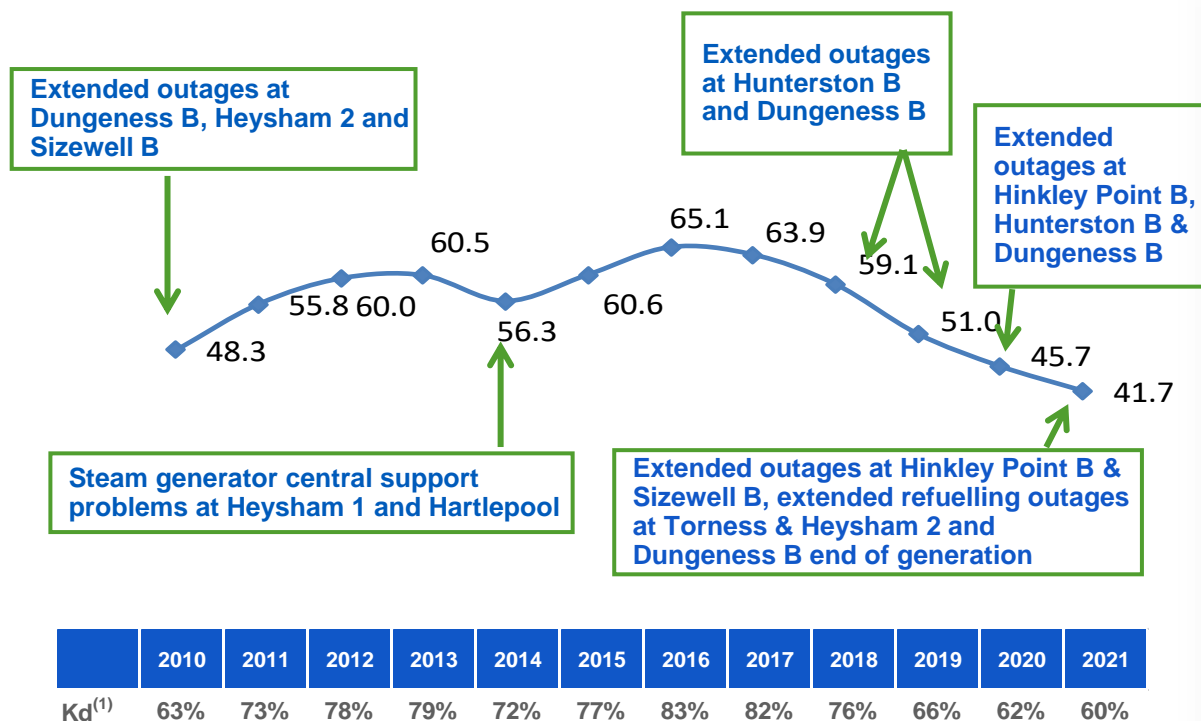
(1) 100% EDF Energy Nuclear Generation output out of total UK Generation as per WMO estimate

(2) At 31 December 2021, Dungeness B and Hunterston B Reactor 3 had been moved to defuelling operations and the capacity of the generating reactors became 7.3GW. (It does not include the closure of Hunterston B Reactor 4 in January 2022)



# KEY CHARACTERISTICS OF EDF ENERGY'S NUCLEAR FLEET

## Output (TWh)



## Key points

- **A nuclear fleet with an average age of 37 <sup>(2)</sup> years**
  - Total power generation capacity of 7.8GW
  - An output of 41.7TWh in 2021
- **Nuclear safety is the over-riding priority**
  - Adequacy of each station confirmed at each statutory outage by the Office for Nuclear Regulation (ONR) that has to provide consent to restart after each outage
  - Periodic safety review (PSR) undertaken every 10 years, also requiring ONR acceptance
- **Expected lifetime**
  - It is anticipated that Sizewell B PWR<sup>(3)</sup> can be extended by 20 years
  - Power generation was formally ended at Dungeness B on 7 June 2021 and at Hunterston B on 7 January 2022
  - The decision has been taken to end power generation at Hinkley Point B no later than 15 July 2022
  - The expected end of power generation for Hartlepool & Heysham 1 is March 2024 and for Heysham 2 & Torness is March 2028 (2 years shorter than the original lifetime)

(1) Unit Capability Factor

(2) Average age of AGRs is 39 years and age of SZB is 27 years. Accounting useful life of SZB has been extended by 20 years with formal approval to take place in 2024.

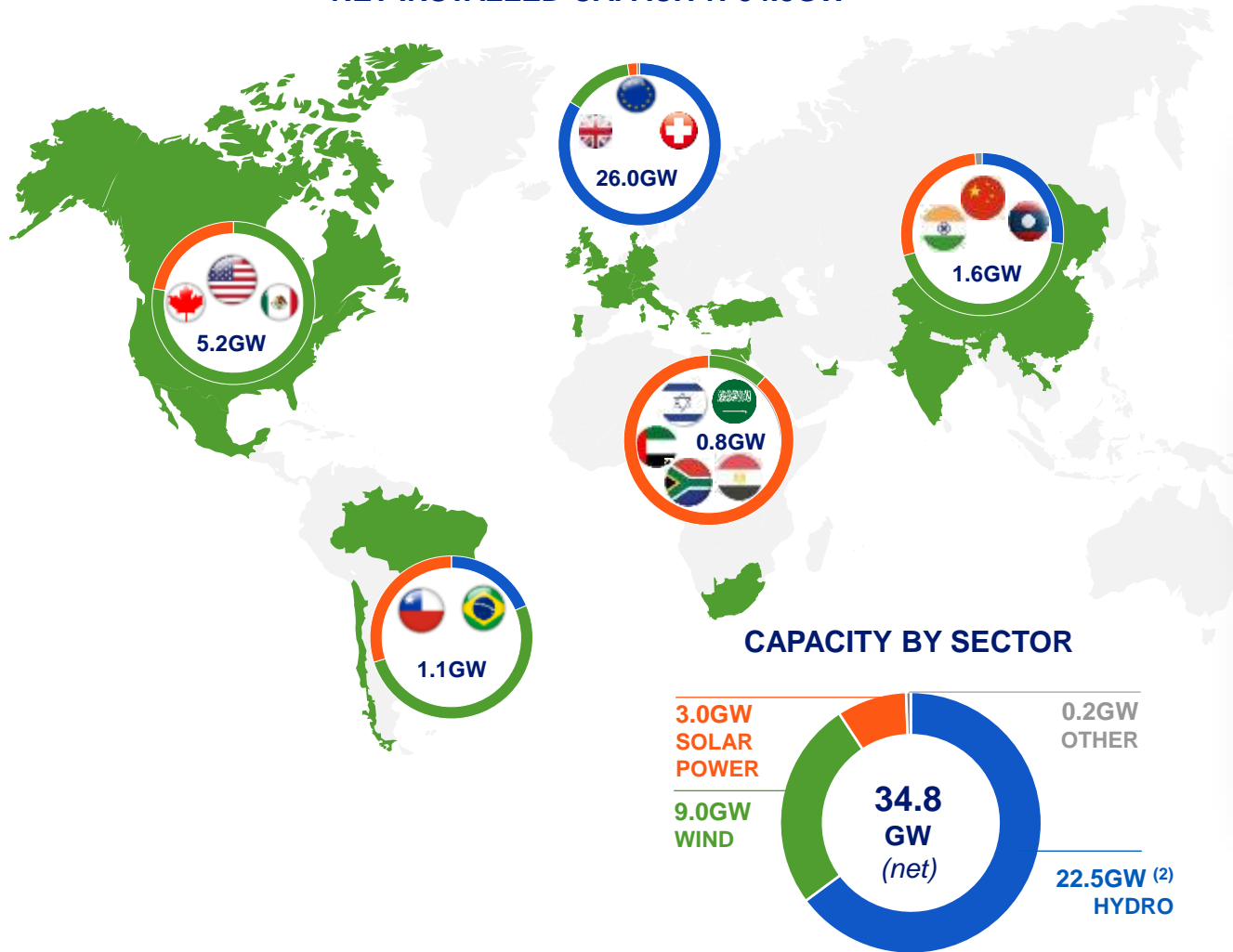
(3) For more information about [EDF Energy's nuclear fleet](#) and about the [AGR and PWR technologies](#), see p. 110



➤ <b>NUCLEAR</b>	<b>P. 77</b>
➤ <b>RENEWABLES</b>	<b>P. 112</b>
➤ THERMAL POWER	P. 133
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# EDF, THE EUROPEAN LEADER IN RENEWABLE ENERGIES

NET INSTALLED CAPACITY: 34.8GW <sup>(1)</sup>



A DIVERSIFIED MIX WITH 34.8GW IN OPERATION

- **22.5GW of hydropower**
- **12.0GW of wind and solar power**
- **0.2GW others** (biomass, geothermy, ...)

HYDROPOWER

- **Leading European producer** of hydropower
- More than **400 production sites** worldwide

A GLOBAL LEADER IN WIND AND SOLAR ENERGY

- **3.1GW gross** commissioned in 2021
- **7.9GW gross** currently under construction (1.5GW in onshore wind power, 1.9GW in offshore wind power, 4.5GW in solar power)

NB: situation at 31/12/2021

(1) Installed capacity shown as net, corresponding to the consolidated data based on EDF's participation in Group companies, including investments in affiliates and joint ventures

(2) Including sea energy: 0.24GW

# RENEWABLE OUTPUT

*Output from fully consolidated entities*

<i>(in TWh)</i>	<b>2020</b>		<b>2021</b>	
Hydro <sup>(1)</sup>	49.4	72 %	46.2	69 %
Wind	17.2	25 %	18.3	27 %
Solar	1.2	2 %	1.8	3 %
Biomass	1.0	1 %	0.8	1 %
<b>Total electricity Group</b>	<b>68.7</b>	<b>100 %</b>	<b>67.1</b>	<b>100 %</b>
<b>Total heat Group</b>	<b>8.6</b>	<b>100 %</b>	<b>7.9</b>	<b>100 %</b>

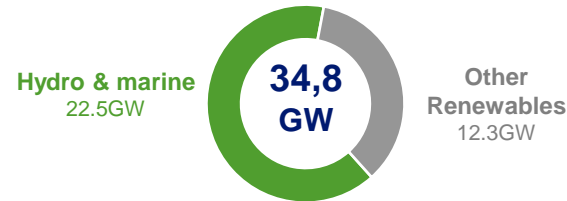
NB: The values correspond to the expression to the first decimal or integer closest to the sum of the precise values, taking into account rounding

(1) Hydro output includes tidal energy for 540GWh in 2020 and 543GWh in 2021. Hydro output after deduction of pumped volumes is 43.2TWh in 2020 and 40.3TWh in 2021

# FRENCH HYDROPOWER – A DIVERSIFIED & FLEXIBLE FLEET

**THE MAIN SOURCE  
OF RENEWABLE POWER  
IN FRANCE**

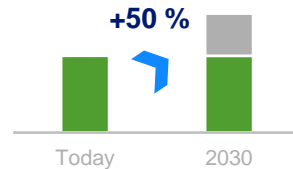
**Net Renewable installed capacity <sup>(1)</sup>  
of the Group in France**



- **427 plants** in France (mainland), average age of **76 years**
- Covering the different kinds of hydropower facilities:
  - Run-of-river / Pondage water / Reservoirs (lake-supplied) / Pumped storage / Tidal power

**UNIQUE STORAGE VALUE,  
CRITICAL FOR THE  
ELECTRICITY SYSTEM**

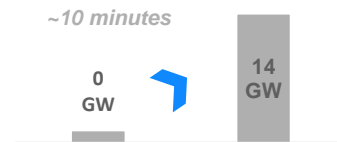
**Estimated weekly flexibility needs <sup>(2)</sup>**



- **Hydropower France provides ~14GW of storage**
  - Reservoirs: 8.1GW
  - Pumped storage: 5.0GW
    - ▣ Including the 1.8GW Grand'Maison facility, the largest European storage asset
- **Only sizeable & cost competitive** electricity storage technology

**AMONG THE MOST FLEXIBLE  
AND REACTIVE GENERATION  
MEANS**

**Response time to reach full  
capacity of plants**



- **Allows quick adjustments to within-day fluctuations in the supply-demand balance**
  - Consumption peaks
  - Non forecasted loss of generation capacity
- Hydropower is the **most significant contributor to ancillary services**

<sup>(1)</sup> Power generation capacity, in proportion of the share the EDF group held in each asset

<sup>(2)</sup> Source: RTE (*Bilan prévisionnel*)



# DIFFERENT TYPES OF HYDROPOWER FACILITIES

**EDF disposes of numerous hydropower facilities, able to meet base-load and peak demand, designed to optimise the use of water resources**

➤ **Run-of-river**

- No storage capacity
- Energy generation depends solely on the current water condition

➤ **Pondage water**

- Average sized water reserve, intended for an occasional use during the week or the day
- Generation is concentrated at peak hours

➤ **Reservoirs**

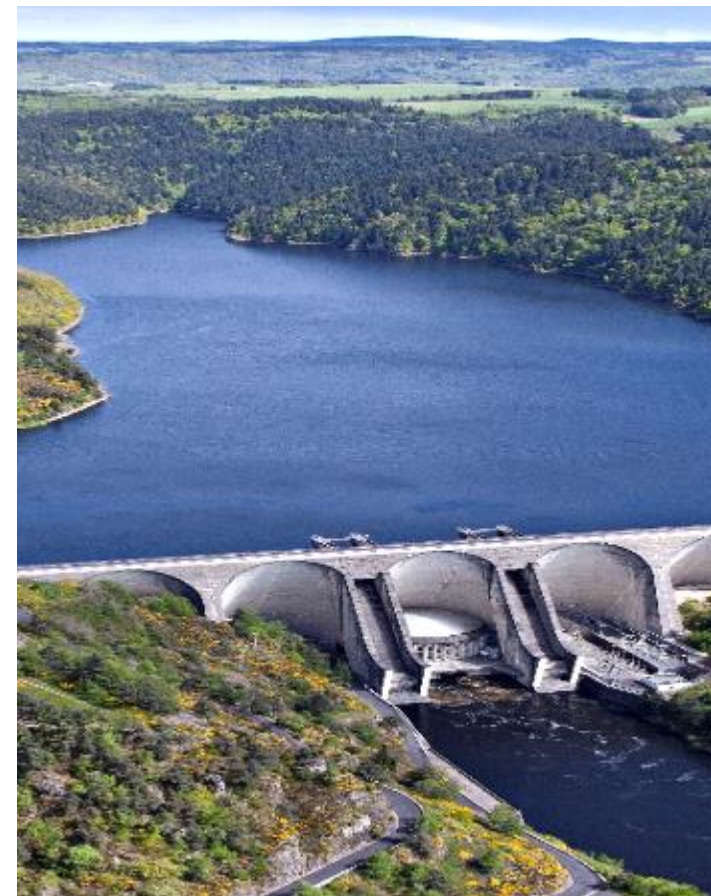
- Large storage capacity
- Influence on downstream power plants (located in mountain ranges) which calls for a management of valley stations

➤ **Pumped storage**

- Massive energy storage
- Water is pumped from a downstream reservoir to an upstream one to create a reserve available during peak-low hours
- Water is then turbined from the upstream reservoir to the downstream one during periods of high demand

➤ **Tidal power**

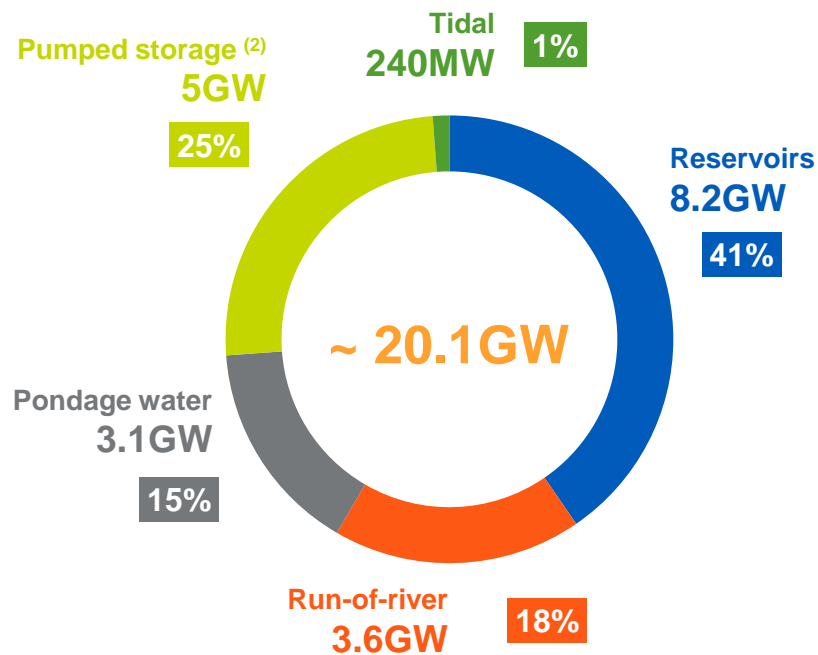
- The tidal power plant of the Rance river uses the tides and sea currents to power the turbines and thus generate electricity (renewable)



Aerial view of the dam and of the Grandval hydro power plant (GEH Lot Truyère)

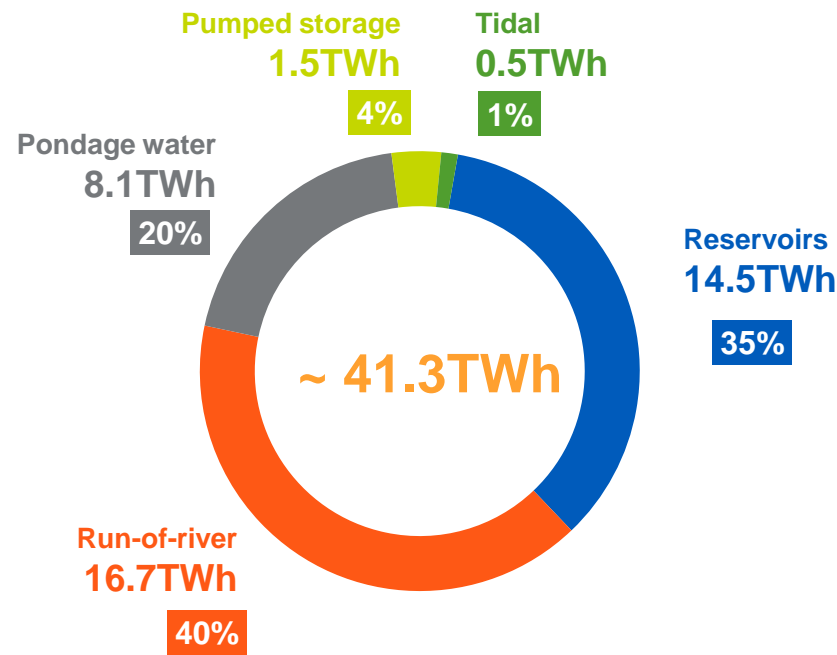
# EDF'S HYDROPOWER FLEET IN MAINLAND FRANCE

Turbine capacity  
in GW



Circa 23% of the EDF's fleet installed capacity in France

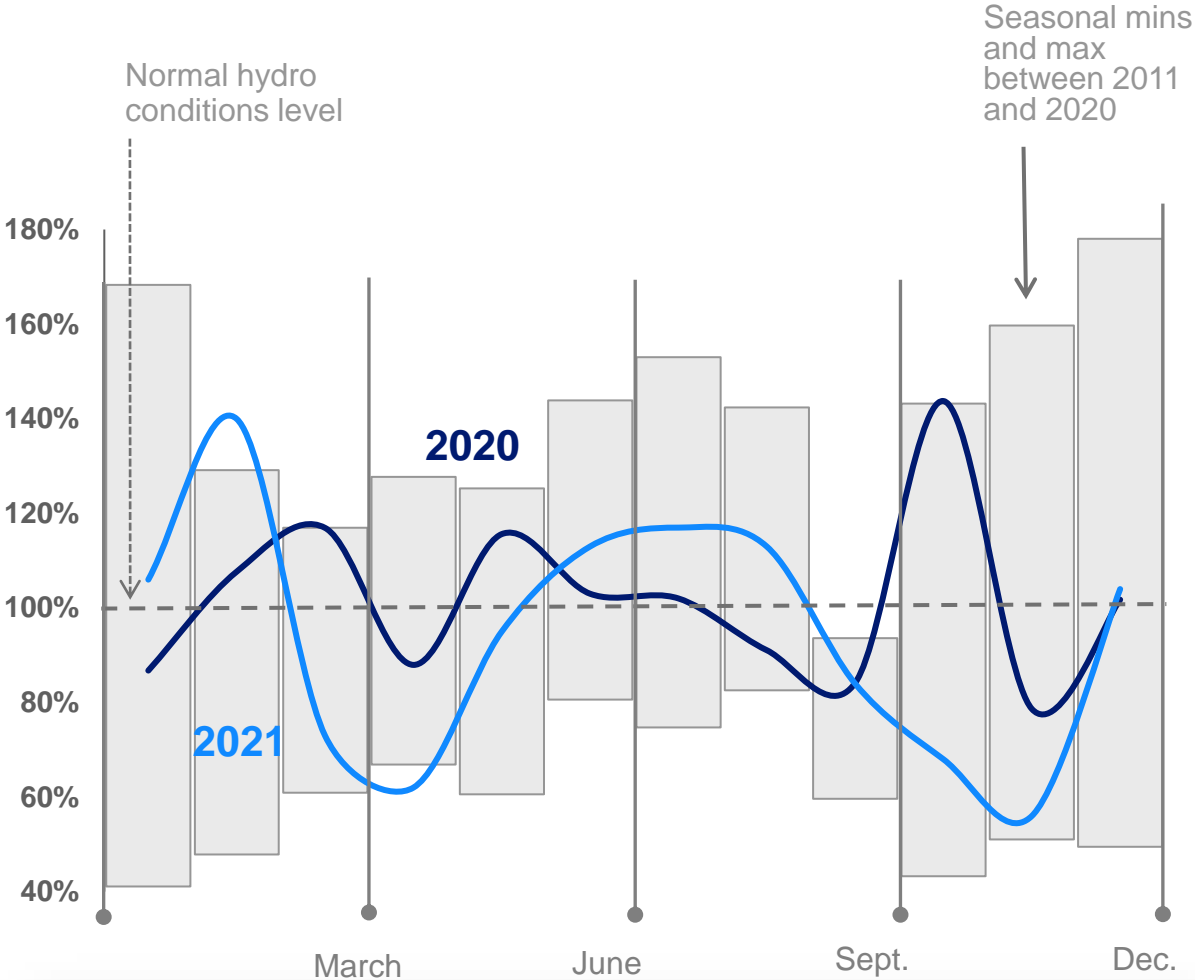
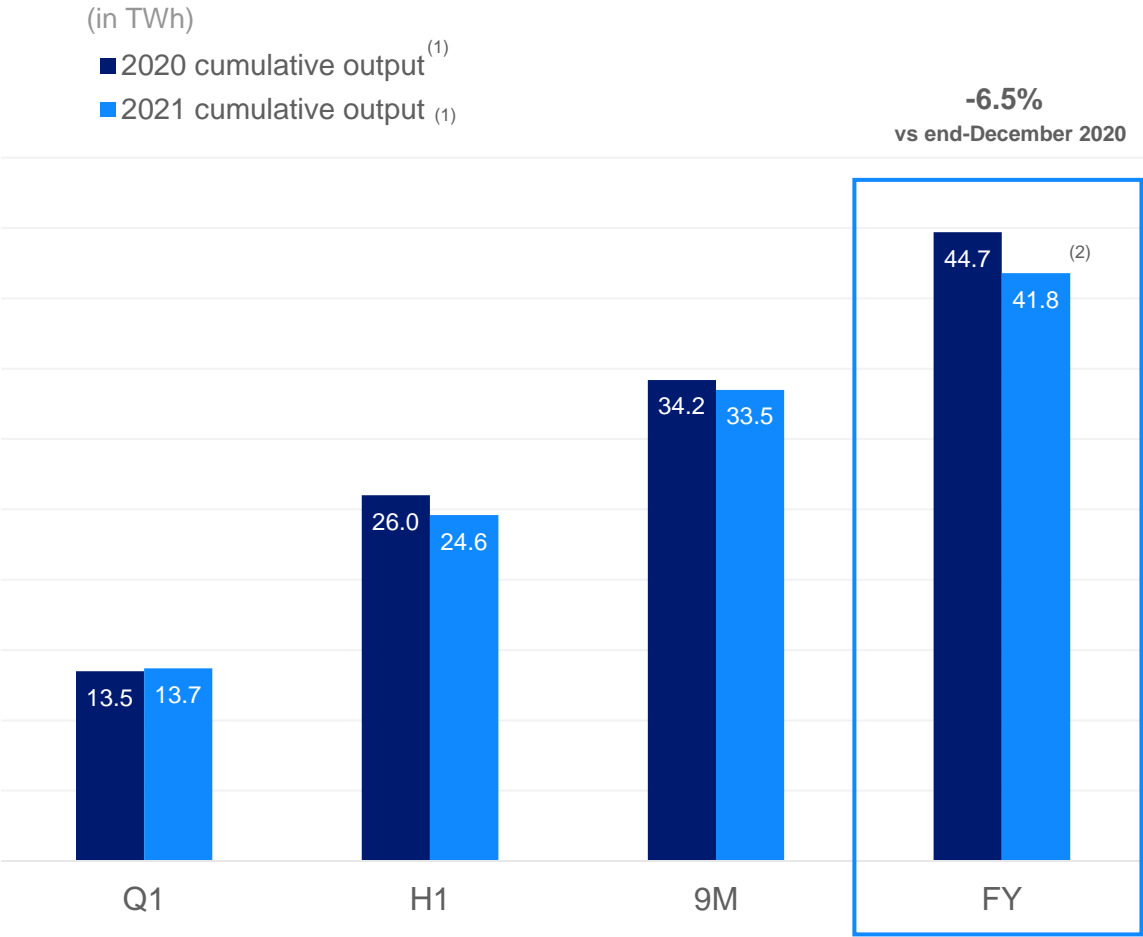
Average producible  
in 50 years (1)



Circa 11.5% of the average EDF output in France

(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 Pumped storage; pumped energy is not taken into account

# FRANCE HYDRO OUTPUT IN MAINLAND FRANCE



1989: 30.5TWh lowest potential hydropower capacity in the last 30 years  
1994: 53.2TWh highest potential hydropower capacity in the last 30 years

- Hydro conditions in 2021 slightly lower than 2020
- Hydraulic reservoirs filling rate in France at 61.7% at end-December 2021: -1.9 points vs historical average

(1) Hydropower excluding electrical activities on French islands, before deduction of pumped volume consumption.

(2) Production after deduction of pumped volume consumption: 38.5TWh in 2020, and 35.6TWh in 2021

# DEVELOP HYDROPOWER IN FRANCE AND ABROAD

EDF operates 80% of mainland France's hydropower potential and 66% of hydroelectricity energy output. EDF is committed to developing its hydropower activities in order to increase their power and availability. EDF's expertise is also recognised internationally

## ➤ FRANCE

- **Improving the performance** of the existing generation fleet. Examples: supplementary power projects Hermillon plant (Savoie) and in Montahut (Hérault).
- Developing **small hydropower facilities**. Examples: Bessans (Savoie) and Naves (Savoie), with works soon to begin.
- Developing **storage with PSHP** (pumped storage hydropower plants): EDF is reviewing several PSHP projects based on existing plants or new plants.
- Promoting **complementarity with intermittent renewable energies**. Example: in Lazer (Hautes-Alpes), EDF achieved a first in France by using the surface of a hydropower dam reservoir for a **floating photovoltaic** project.

## ➤ INTERNATIONAL

- **Developing engineering and operating service offers** internationally.
- **Nachtigal (Cameroon)**: construction of a 420MW dam (see [p. 120](#)).
- **Hatta (UAE)**: continuation of PSHP project.

## ➤ BIODIVERSITY

- **Rhine**: launch of studies on works for fish bypass systems at the hydropower plants of Rhinau and Marckolsheim. This operation is funded by the France Relance recovery plan and the European Union for a maximum €80m.
- **Poutès**: The new dam at Poutès has been built. It is the result of ongoing dialogue with stakeholders to strike a balance between renewable energy output and the protection of Atlantic salmon, which can now freely access their reproduction sites in the upper valley of the Allier.

# NACHTIGAL HYDROELECTRIC DAM IN CAMEROON (1)

## MAIN ASPECTS OF THE PROJECT

- Design, construction and operation for a period of 35 years of a 420MW run-of-the-river hydropower plant on the Sanaga river near the Nachtigal Falls
- Construction of a 50-km power transmission line
- Project will be owned and operated by NHPC (Nachtigal Hydro Power Company), established since December 2018, currently comprising EDF (40%) <sup>(2)</sup>, IFC (20%), the Republic of Cameroon (15%), Africa50 (15%) and STOA (10%)
- Expected annual power generation of 3TWh, which will cover 30% of the energy needs of the country
- Substantial economic benefits: up to 3,000 direct jobs during peak construction periods, of which 65% will be locally sourced within a 65km radius of the construction site. The project will generate dozens of permanent jobs

## FINANCING STRUCTURE

- Project's expected total cost: €1.2 billion
- Shareholders' equity to fund a quarter of the project, lenders to fund the rest
- The lender group includes 11 Development Finance Institutions (DFI) and 4 local commercial banks <sup>(3)</sup>
- The largest hydropower project ever built in Africa through non-recourse project finance debt

## TIMELINE

- Final and binding agreements signed on 8 November 2018, financial closing on 24 December 2018
- Start of construction in March 2019, 53% of civil engineering achieved at 31/12/2021
- Construction slowdown: the Covid-19 pandemic and concrete supply and production difficulties have led to an estimated 10-month delay in operational commissioning, now planned for summer 2024

## 420MW run-of-the-river hydropower plant



(1) Refer to the press release published by EDF on 8 November 2018

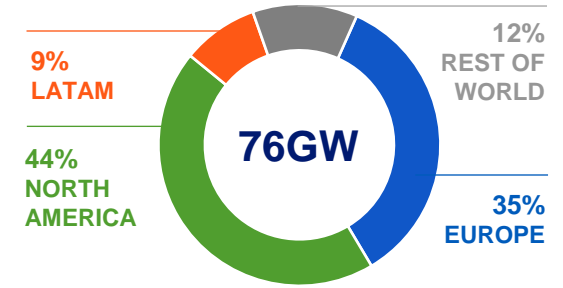
(2) Equity consolidation method

(3) Including: AfDB, IFC (International Finance Corporation) – member of the World Bank Group, CDC, European DFI coordinated by Proparco (AFD, DEG and FMO), EIB, OFID, EAIF, AFC. Local banks include: Attijari/SCB, BICEC, SG Cameroun and Standard Chartered

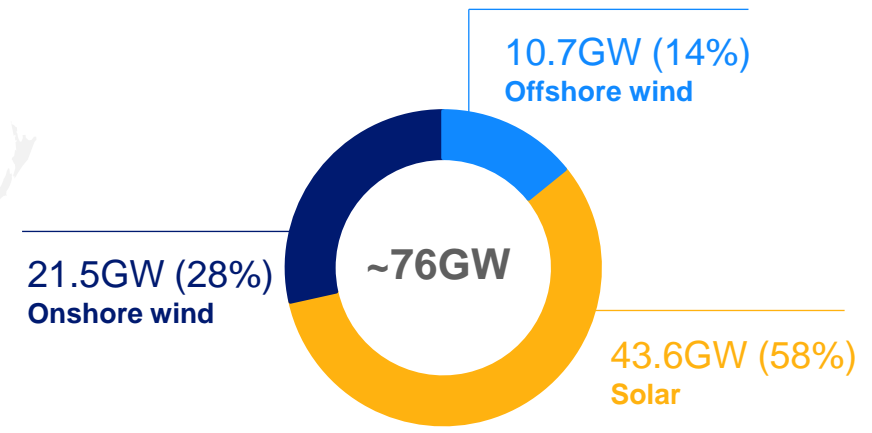


# A PORTFOLIO OF WIND AND SOLAR PROJECTS OF ~ 76GW <sup>(1)</sup> (1/2)

A PROJECT PORTFOLIO THAT IS **DIVERSIFIED GEOGRAPHICALLY...**



**... AND BALANCED BETWEEN WIND AND SOLAR**

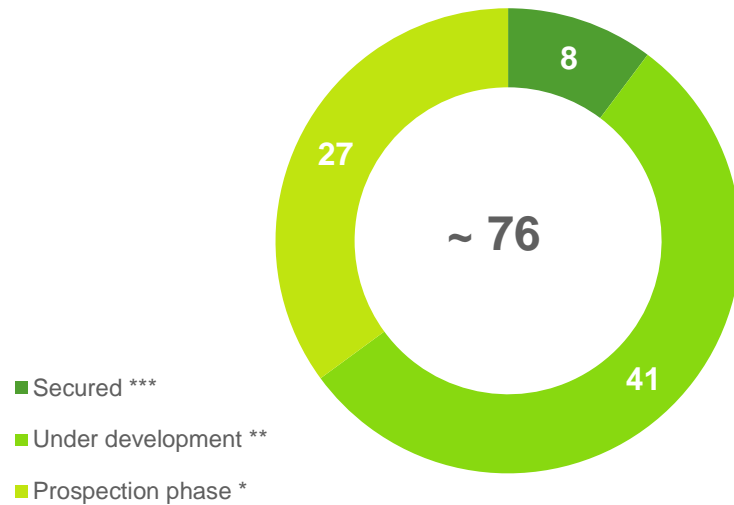


NB: situation at 31/12/2021

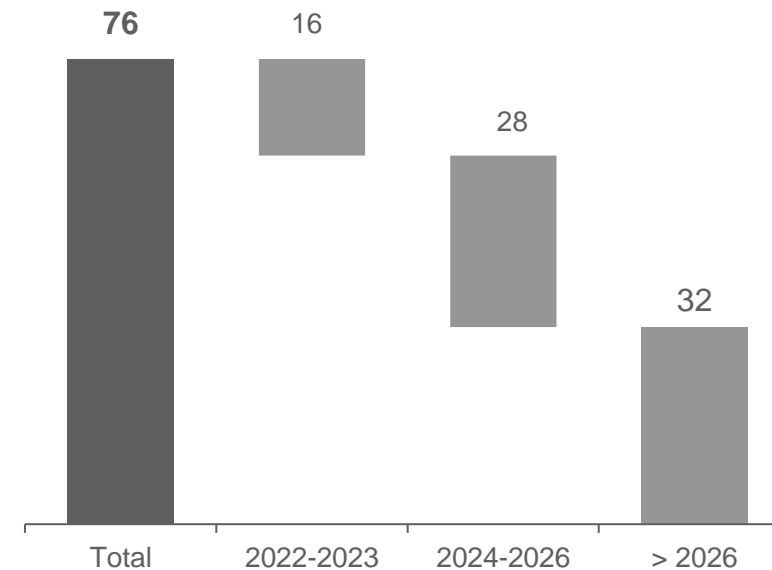
(1) Pipeline excluding capacities under construction. Gross data corresponding to 100% of the capacity of the projects concerned.

# A PORTFOLIO OF WIND AND SOLAR PROJECTS OF ~ 76GW <sup>(1)</sup> (2/2)

PORTFOLIO OF PROJECTS <sup>(2)</sup> BREAKDOWN  
BY DEVELOPMENT PHASE (IN GW)



PIPELINE BREAKDOWN BY DATE OF START  
OF CONSTRUCTION (IN GW) <sup>(3)</sup>



\* Start of land identification and preliminary studies

\*\* Sufficient land securisation and start of technical studies

\*\*\* Securing a power purchase agreement (following a call for tenders, auction, OTC negotiation)

NB: situation at 31/12/2021

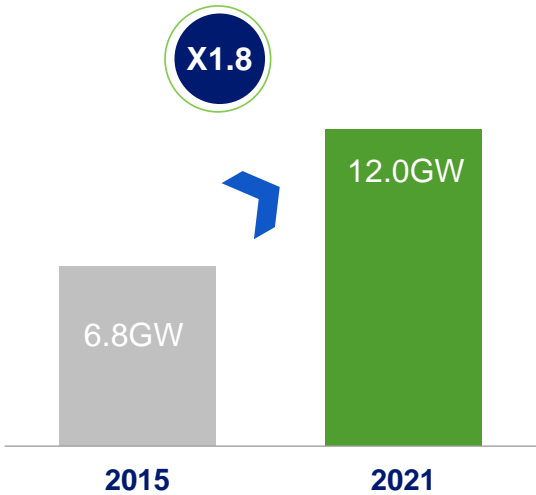
(1) Pipeline excluding capacities under construction. Gross data corresponding to 100% of the capacity of the projects concerned.

(2) All the projects in prospection phase included in the pipeline, starting 2020

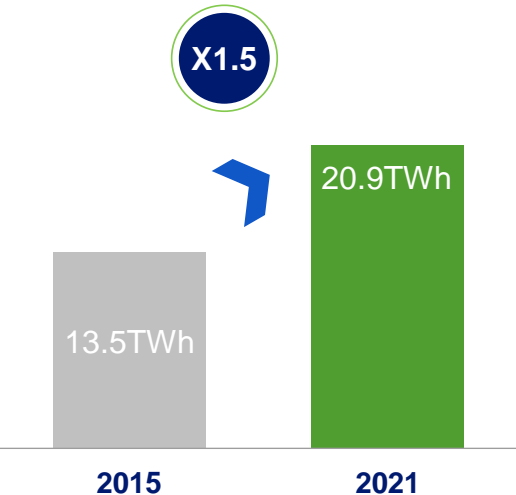
(3) Start of construction portfolio, not probability-based

# STRONG GROWTH BASED ON A LARGE PROJECT PORTFOLIO

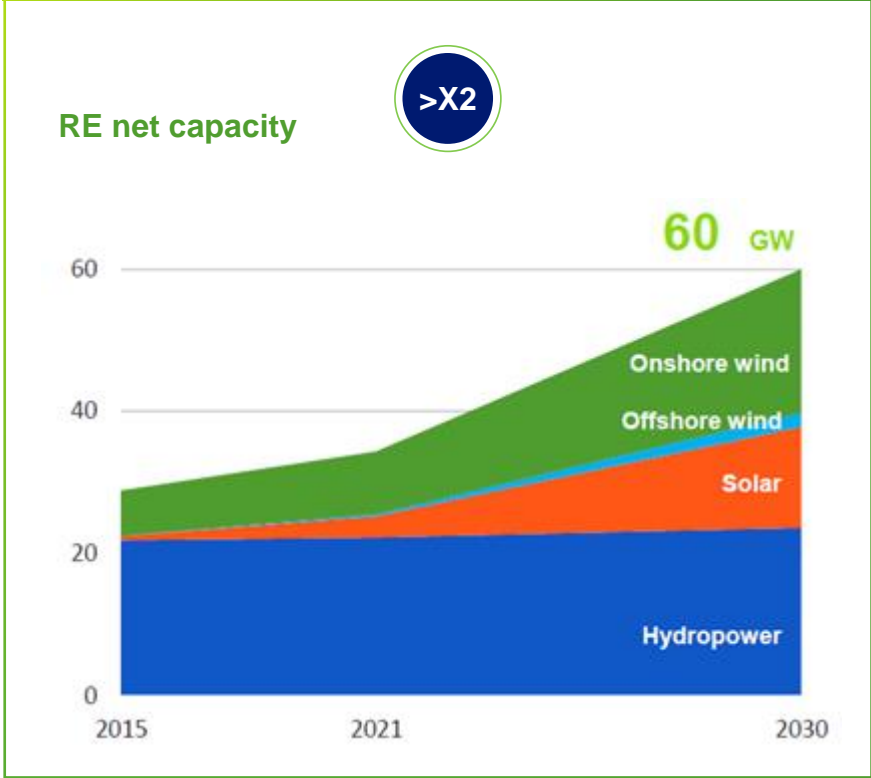
Net installed capacity<sup>(1)</sup> x 1.8  
since 2015



Significant increase in  
total output<sup>(1)</sup>



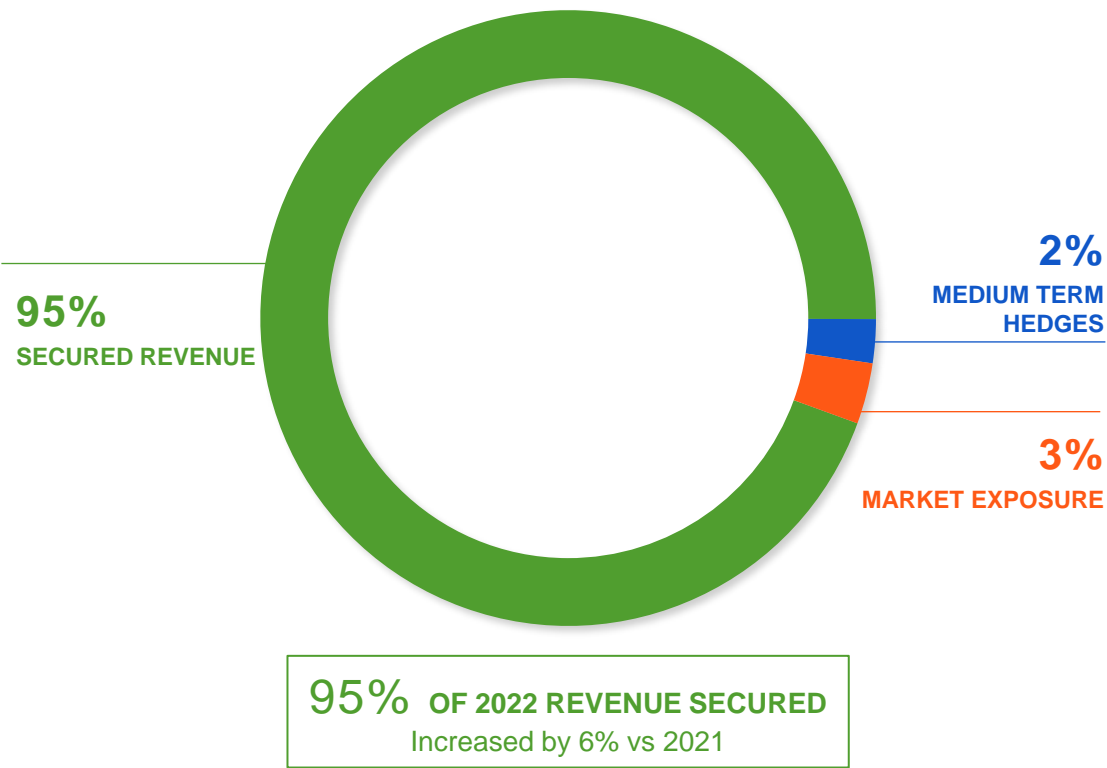
## 2030 Ambitions (including hydro)



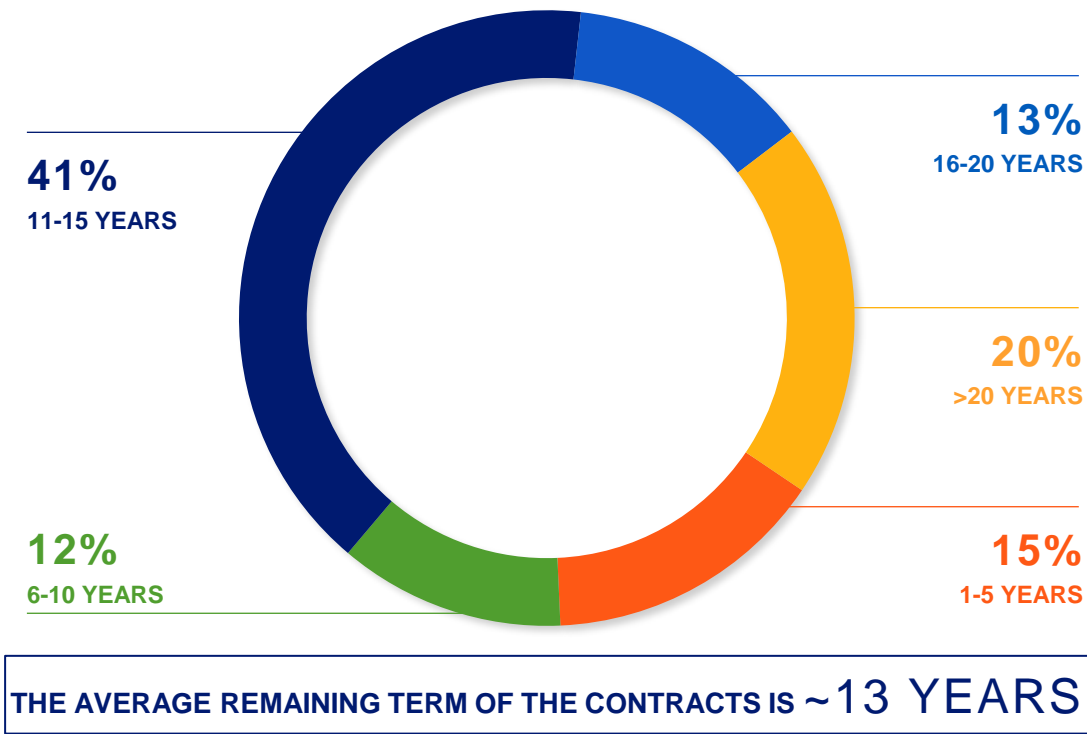
(1) In GW net. Solar and wind.

# REVENUE SECURED BY LONG-TERM CONTRACTS

CONTRACTUALISATION OF 2022 CONSOLIDATED REVENUE FROM RENEWABLE GENERATION <sup>(1)</sup>



AVERAGE RESIDUAL DURATION OF LONG TERM CONTRACTS <sup>(2)</sup>



(1) Based on the estimate of 2022 revenues from fully consolidated assets  
(2) Weighting according to estimated 2022 revenues of fully consolidated assets

# OFFSHORE WIND DEVELOPMENTS IN FRANCE: 5 PROJECTS FOR A TOTAL CAPACITY OF MORE THAN 2GW, INCLUDING ~ 1GW UNDER CONSTRUCTION

## ONGOING CONSTRUCTIONS

- **Saint Nazaire offshore wind farm** (started in 2019, expected commissioning in 2022, ~€2bn total investments, partnership with Enbridge)
- **Fécamp offshore wind farm** (started in 2020, expected commissioning in 2023, ~€2bn total investments, partnership with Enbridge and WPD)

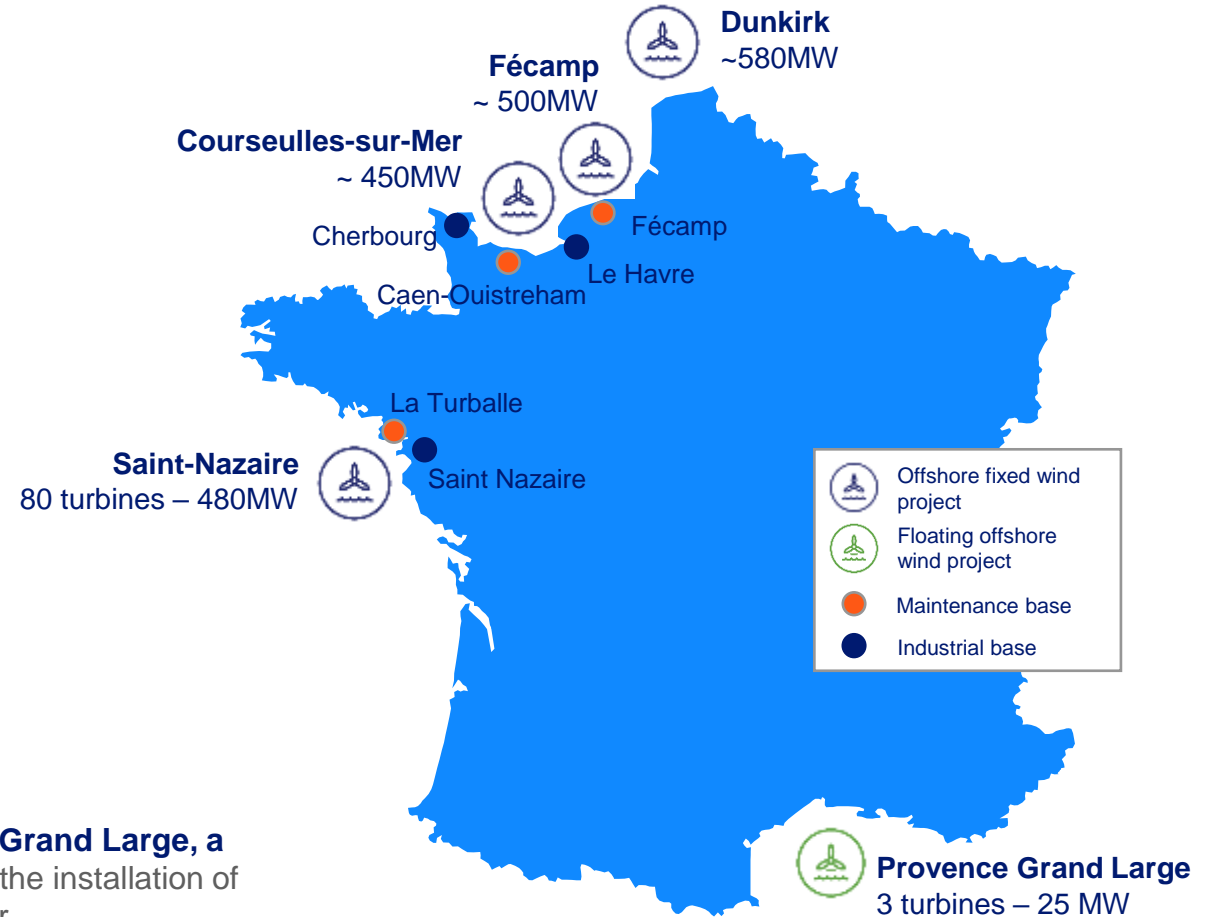


## Major achievements in 2021

- **Calvados offshore wind farm (Courseulles-sur-Mer)**
  - Start of construction in February 2021
  - Expected commissioning in 2024
  - ~€2bn total investment, partnership with Enbridge and WPD

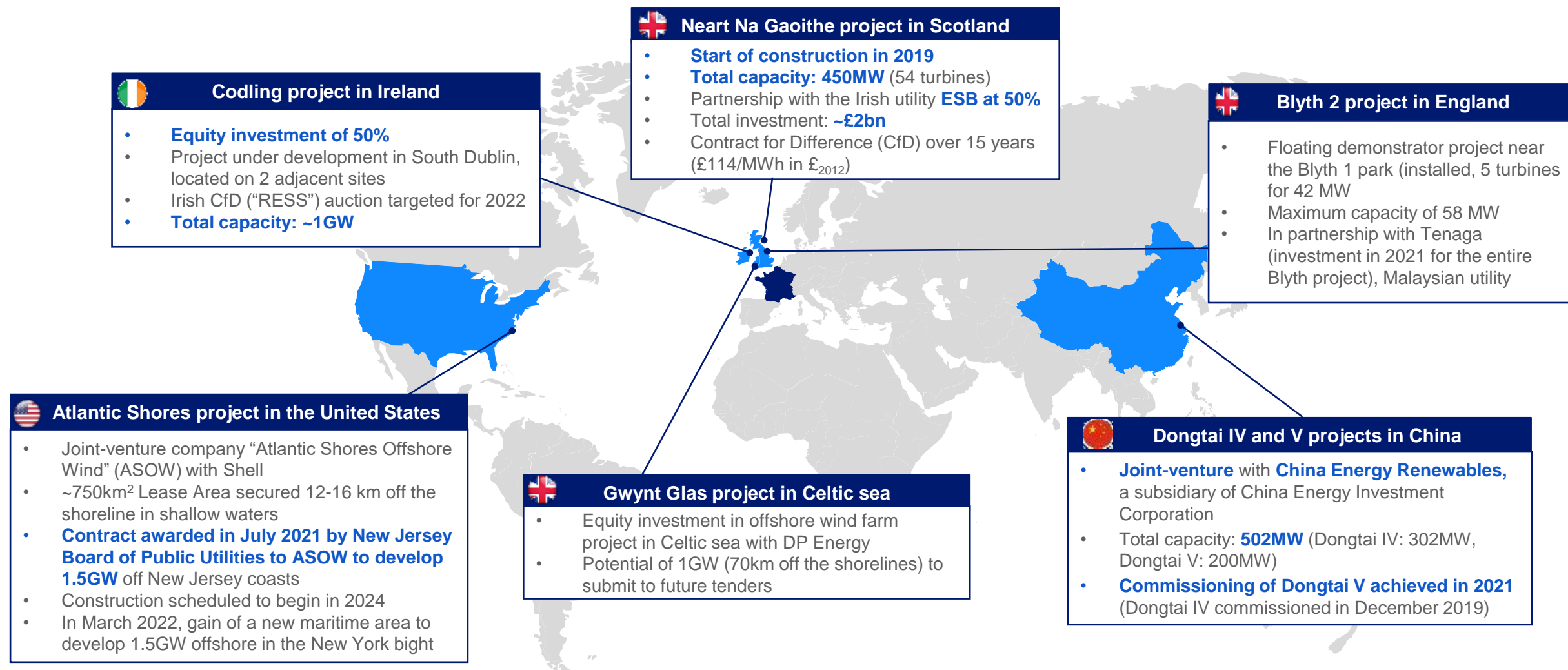
## FURTHER DEVELOPMENTS

- Ongoing development of **Dunkirk offshore wind farm** (~€1bn total investment, partnership with Enbridge)
- Participation in tenders in Normandy in partnership with Enbridge and CPPIB
- Development in progress and preparation of construction of **Provence Grand Large, a floating wind pilot project**: contract awarded to EDF Renewables for the installation of three 8MW turbines on floating foundations off the coast of Fos-sur-mer
- Participation in tenders in South Brittany with Enbridge and CPPIB





# INTERNATIONAL OFFSHORE WIND DEVELOPMENTS: NEARLY 4GW IN DEVELOPMENT, 450MW UNDER CONSTRUCTION IN SCOTLAND



# SOUTH AFRICA: EDF RENEWABLES WINS 5 PROJECTS IN 2021 FOR A TOTAL OF c. 850MW (WIND, SOLAR PV, STORAGE)

- **3 wind projects won** by EDF Renewables and its local partners (H1 holdings and Gibb-Crede) with **installed capacities of 140MW each** in the fifth bid window of the REIPPP <sup>(1)</sup>
- Tender won by EDFR and a local partner to supply solar power to **mining company Anglo-American Platinum : project for the construction and operation of a 100MW solar power plant**
- Umoyilanga project won in the Risk Mitigation IPP Procurement Programme, **combining solar, wind and battery storage technologies (77MW wind + 138MW solar PV + 75MW storage)**
- Additionally, EDF Renewables commissioned in 2021 the Wesley wind farm (34.5MW), reaching a total of 144MW installed capacity in South Africa



(1) Renewables Energy Independent Power Producer Procurement

# A SUSTAINABLE BUSINESS MODEL BASED ON KEY COMPETITIVE ADVANTAGES

DEVELOPMENT	<ul style="list-style-type: none"> <li>• <b>Key competitive advantages for the development of a strong project portfolio</b> <ul style="list-style-type: none"> <li>– A large and diverse international presence with seasoned development teams in Europe and North America and dedicated development hubs in Asia Pacific, Latin America, Middle East and North Africa</li> <li>– Expertise in site security, engineering, procurement, structured financial arrangements and participation in tenders</li> <li>– Key local partnerships in order to share investments, country risk and maximize competitive advantage</li> <li>– Strong portfolio, in renewal and with a good transformation rate</li> </ul> </li> <li>• <b>Synergies</b> within EDF group for <b>customer-tailored solution</b> (PPAs for commercial and industrial customers, off-grid or decentralised offers)</li> </ul>
ENGINEERING & CONSTRUCTION	<ul style="list-style-type: none"> <li>• <b>Strong engineering expertise</b></li> <li>• <b>Significant expertise in the construction of industrial-scale projects and operational excellence in delivering</b> at budgets and deadlines</li> <li>• <b>Continued technical innovation</b> to seize opportunities in new markets (floating PV, floating offshore wind, etc.)</li> </ul>
O&M AND ASSET MANAGEMENT	<p><b>Integrated skills in O&amp;M</b> supporting <b>operational excellence, optimised production, technological expertise</b></p>
DECOMMISSIONING	<ul style="list-style-type: none"> <li>• Expertise on <b>decommissioning of end-of-life assets</b></li> <li>• Proactive approach on <b>blades recycling</b> (partnership with Siemens Gamesa for the deployment of offshore recyclable blades)</li> </ul>

VALUE CREATION:

**+150-200 bps**

DIFFERENCE BETWEEN  
THE EXPECTED RETURN  
RATE AND WACC <sup>(2)</sup>

(1) EDF Renewables Development, Engineering and Construction internal teams. Excluding contractors and partners capabilities

(2) Difference above WACC. Historical average performance estimated as part of a profitability analysis of EDF Renewables projects (scope: 7.5GW net, 126 projects, 15 countries). The IRR calculation takes into consideration the various assumptions (including market prices evolutions)

# TECHNOLOGICAL INNOVATION: A KEY COMPETITIVE ADVANTAGE

## PHOTOVOLTAIC SOLAR

- **Increase the capacity of installations thanks to bifacial PV modules**
- **Unlock new potentials in solar PV in geographically constrained areas thanks to floating photovoltaic solar installations ...**
  - Ongoing construction of a floating photovoltaic power plant of 20MW in France (Lazer, Hautes-Alpes, expected commissioning in 2022)
- **... and Agri-PV**
  - 1st co-developed pilot project with INRA, in operation at EDF R&D center « les Renardières »
  - 45% stakes taken in Green Lighthouse Development (GLHD) a pioneer of agri-PV in France with a pipeline of 2.5GW

## OFFSHORE WIND

- **Exploiting new offshore potential with floating:** Provence Grand Large (France, a floating project of 3 x 8.4MW located off the coast of Fos-Sur-Mer), and Blyth II

## STORAGE

- **Development of flexibility on the grid using Li-ion batteries coupled to generation assets:** Umoyilanga project in South Africa (solar PV and wind) won in 2021, Desert Quartzite in the USA (solar PV) won in 2021, and Maverick 2 (USA) commissioned
- **Development of storage projects** (in the UK, Pivot Power commissioned 2 storage projects located in Kemsley and Oxford and currently builds 2 projects located in Coventry and Sandwell) **and charging systems for electric vehicles** (via PowerFlex in the United States)
- **Microgrid projects** in remote areas: tender won to **develop, build and operate around 100MW of photovoltaic capacities, and more than 100MWh of battery energy storage in Iquitos, Peru**. Iquitos is the largest city in world not connected to a national power grid, not accessible by roads

# ~ 17.5GW OF O&M: STRONG EXPERTISE, DIFFERENTIATING FACTOR



17.5 GW of O&M contracts

Remote control and optimisation in real time via a control centre



10 countries



3 technologies  
(onshore wind, offshore wind, solar PV)



OPTIMISED ASSET PERFORMANCE

- **Digitalisation and supervision in real time.** Ongoing data lake creation for asset performance optimisation
- **Predictive maintenance** via algorithms dedicated to anticipate defaults, wear, damage

ENHANCED TECHNICAL EXPERTISE

- Continuous feedback on technical issues via O&M monitoring **strengthening knowledge and understanding of industrial technologies**
- A **strong credibility** vis-à-vis turbine manufacturers and third-party investors

REINFORCED COMPETITIVENESS DURING THE DEVELOPMENT PHASES

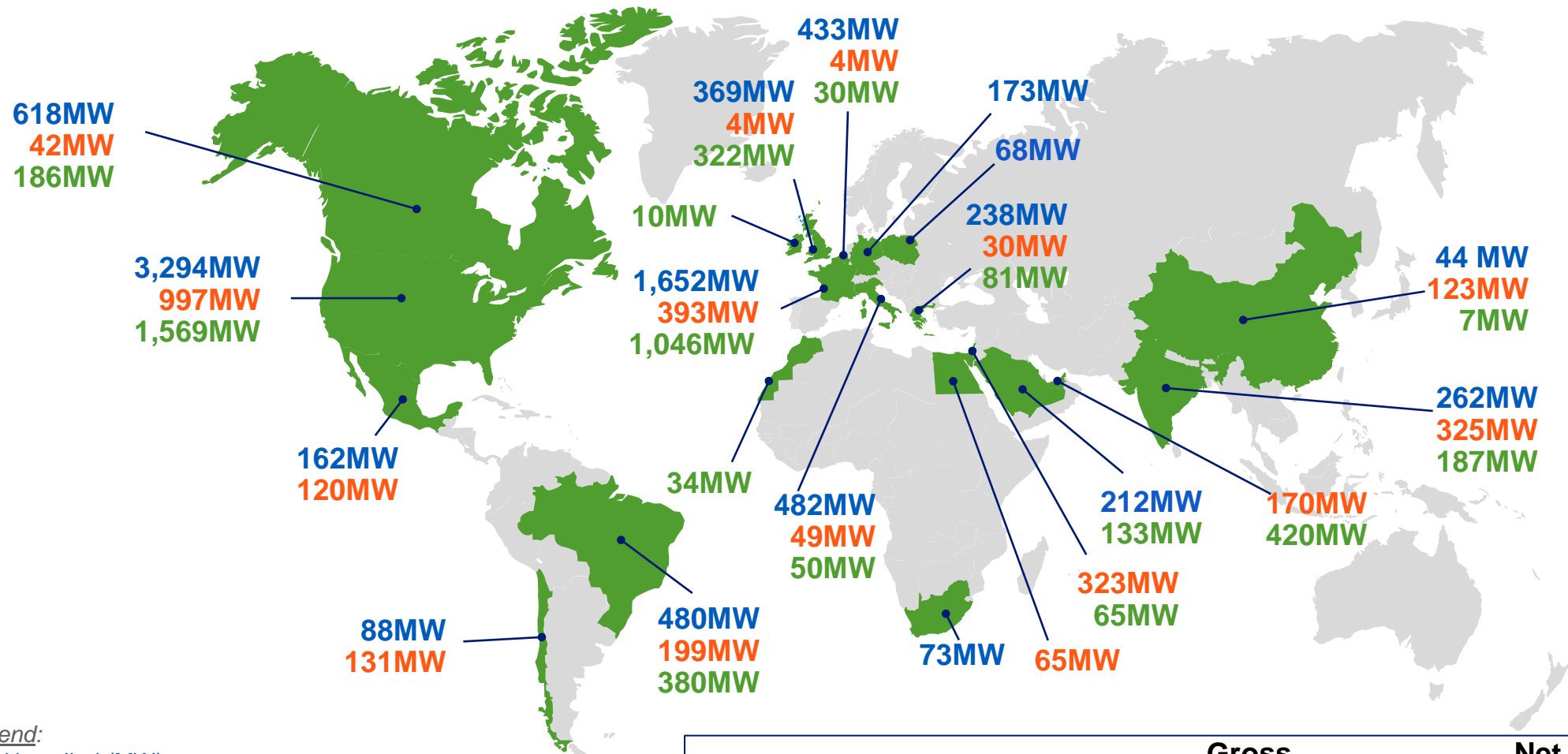
- **More competitive price positioning on tenders**
- **Contract optimisation** thanks to the competition between turbine suppliers for initial or renewal O&M contracts
- **Early stage project optimisation** (development, construction, etc.)

(1) GW generated by renewable energy power plants that EDF operates and maintains (plant supervision, monitoring of production, preventive and corrective maintenance, etc.) on its own behalf or for a third party



# NET CAPACITY INSTALLED AND UNDER CONSTRUCTION - DECEMBER 2021

(1)



## Legend:

Wind installed (MW)

Solar installed (MW)

Wind and solar under construction (MW)

	Gross	Net
Installed capacity	19,005MW	12,021MW
Capacity under construction	7,885MW	4,520MW
<b>Total</b>	<b>26,890MW</b>	<b>16,541MW</b>

# INSTALLED CAPACITY AND CAPACITY UNDER CONSTRUCTION, WIND & SOLAR, AS OF 31 DECEMBER 2021

(in MW)	Gross <sup>(1)</sup>		Net <sup>(2)</sup>	
	31/12/2020	31/12/2021	31/12/2020	31/12/2021
Wind	12,889	13,606	8,379	9,047
Solar	4,254	5,399	2,199	2,975
<b>Total installed capacity</b>	<b>17,142</b>	<b>19,005</b>	<b>10,578</b>	<b>12,021</b>
Wind under construction	4,126	3,391	2,814	2,169
Solar under construction	3,865	4,495	1,928	2,350
<b>Total capacity under construction</b>	<b>7,990</b>	<b>7,885</b>	<b>4,743</b>	<b>4,520</b>

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

(1) Gross capacity: total capacity of the facilities in which EDF Renewables has a stake

(2) Net capacity: capacity corresponding to EDF' stake

# EDF GROUP MAIN BUSINESSES

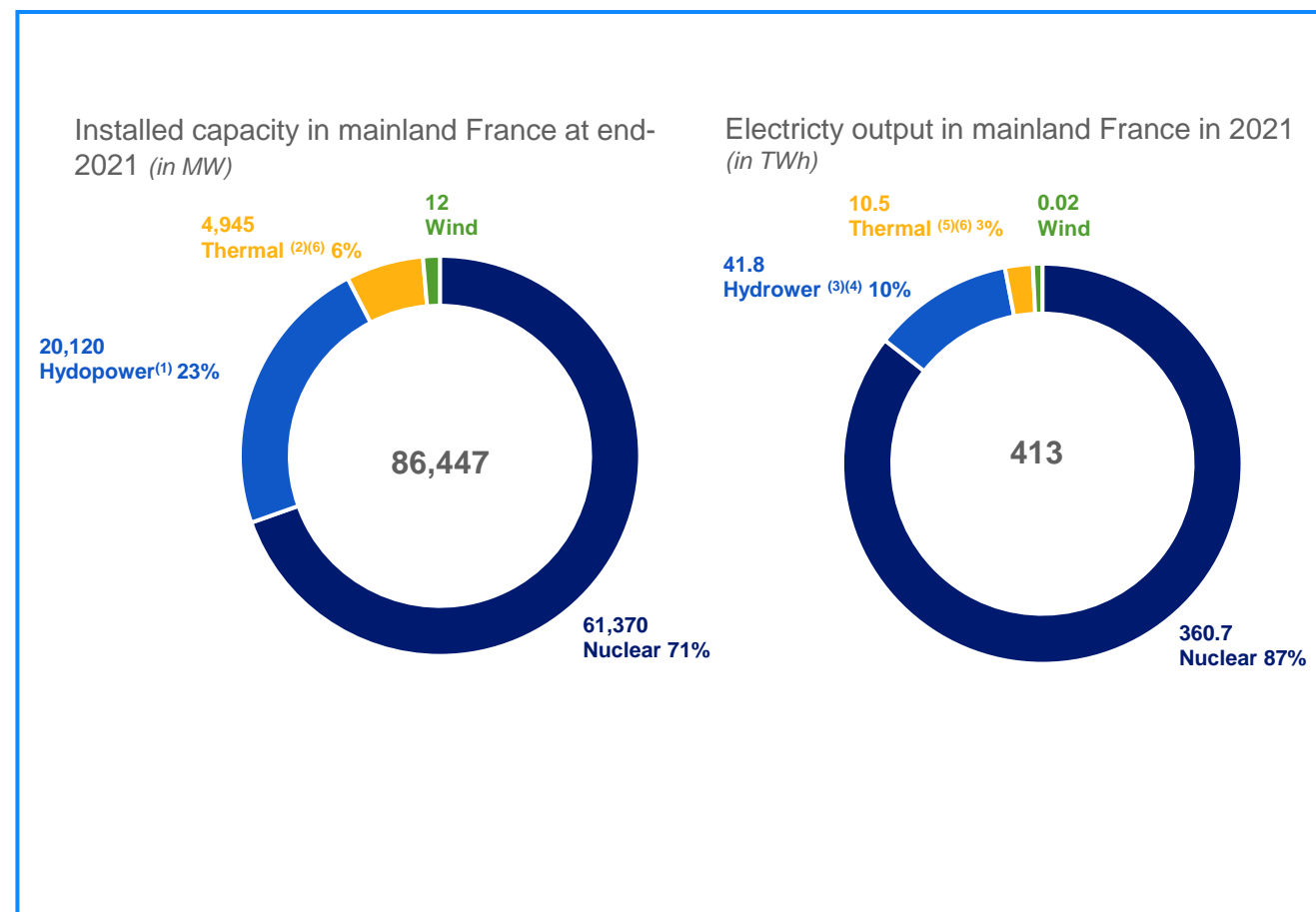


➤ <b>NUCLEAR</b>	<b>P. 77</b>
➤ <b>RENEWABLES</b>	<b>P. 112</b>
➤ <b>THERMAL POWER</b>	<b>P. 133</b>
➤ <b>REGULATED ACTIVITIES (NETWORKS)</b>	<b>P. 136</b>
➤ <b>OPTIMISATION &amp; TRADING</b>	<b>P. 150</b>
➤ <b>CUSTOMER SOLUTIONS</b>	<b>P. 166</b>
➤ <b>ENERGY SERVICES</b>	<b>P. 181</b>
➤ <b>GAS</b>	<b>P. 188</b>

# ADJUSTMENT OF THERMAL POWER TO EDF'S LOW CARBON STRATEGY

## Modernisation of the EDF's fleet in mainland France to improve its technical and environmental performance and to prepare the end of coal-fired power generation

- The vast program to modernize EDF's thermal power plants, which runs from 2007 to 2016, has significantly improved the Group's carbon footprint. Over the period, the Group carbon intensity in gCO<sub>2</sub>/kWh decreased by 32.5%
- The Group plans **to phase out coal-fired power generation by 2030**, in all geographical areas.  
**In France:** Closing of the coal-fired powerplant in Le Havre in April 2021 <sup>(6)</sup> and operation of Cordemais limited in 2022 to 1,000 hours for January and February and 600 hours for the rest of the year.
- Commissioning of 4 Combined Cycle Gas Turbines (CCGT) between 2011 and 2016 to replace coal-fired plants that have been shut down
- Thermal represents ~ 6% of the EDF group's installed capacity. The share of thermal in the energy mix of the Group varies from one country to another: in 2021 it reached ~ 3% of electricity generation in France and ~ 70% in Italy



(1) Excluding Corsica and overseas departments, 439MW in 2021 and including tidal generation capacity of 240 MW

(2) Excluding Corsica and overseas departments, 1,567 MW in 2021

(3) Excluding Corsica and overseas departments, 1.3TWh in 2021

(4) Generation including pumped storage consumption

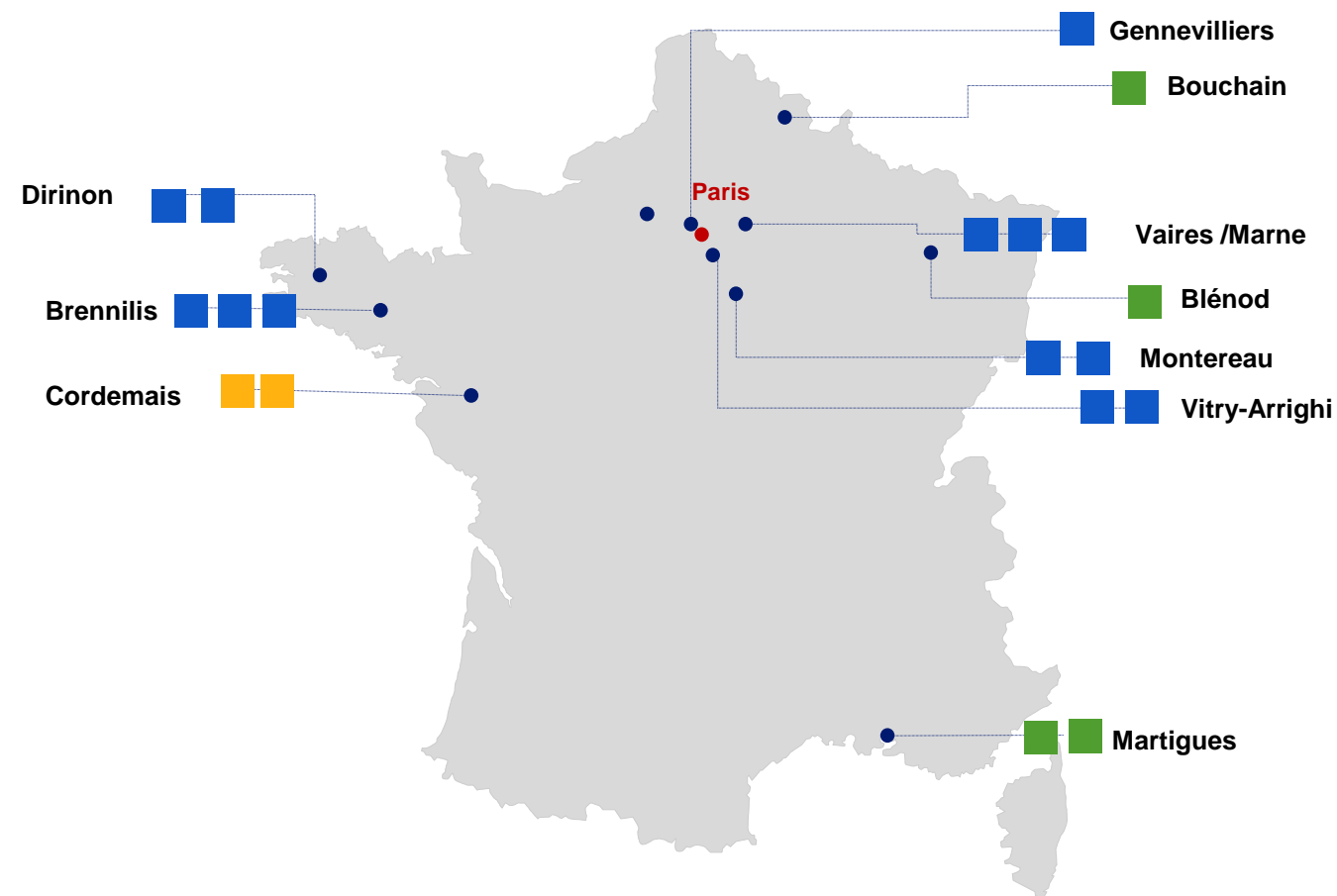
(5) Excluding Corsica and overseas departments, 4.4TWh in 2020

(6) Incl. Le Havre coal power plant, shut down

(7) Decree on 5 February 2022

Source : Universal Registered Document 2021 EDF

# EDF THERMAL PLANT FLEET IN MAINLAND FRANCE



~ 10 production sites ~ 5GWe <sup>(1)</sup>

- **Coal-fired plants**  
Two units totalling 1,160MW <sup>(1)</sup>
- **Combined-Cycle Gas turbines (CCGT)**  
Four CCGTs totalling 1,950MW
- **Combustion turbines (TAC)**  
Thirteen TACs totalling 1,850MW

(1) Latest figures including the shutdown of the coal-fired power plant in Le Havre in April 2021

# EDF GROUP MAIN BUSINESSES



- **NUCLEAR** P. 77
- **RENEWABLES** P. 112
- **THERMAL POWER** P. 133
- **REGULATED ACTIVITIES (NETWORKS)** P. 136
- **OPTIMISATION & TRADING** P. 150
- **CUSTOMER SOLUTIONS** P. 166
- **ENERGY SERVICES** P. 181
- **GAS** P. 188



# ENEDIS <sup>(1)</sup>: KEY FIGURES

In millions of euros	December 2020	December 2021	Δ%
Sales	14,211	15,358	+8.1
EBITDA	4,285	4,994	+16.5
Net income excl. non-recurrent items	835	1,392	+66.7
Gross operating investments <sup>(2)</sup>	3,962	4,379	+10.5

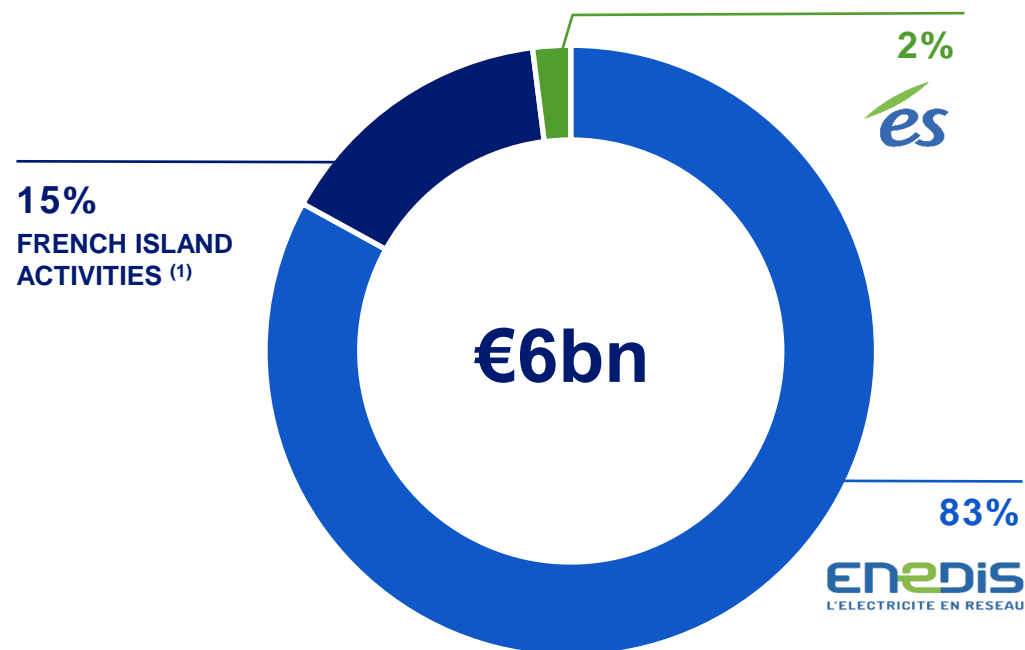
(1) Enedis, an independant EDF subsidiary as defined in the French energy code; local data

(2) Including Linky

# A REGULATED BUSINESS MODEL IN A SOLE AUTHORIZED STATE CONCESSION OPERATOR MODEL

Regulated activities represent over €6bn annual EBITDA

Breakdown of EBITDA for EDF's regulated activities



(1) French island electrical activities include Corsica, Martinique, Guadeloupe, French Guiana, Reunion and Saint Pierre and Miquelon, Saint Barthélemy, Saint Martin and Ponant islands

Key assets in France

ENEDIS  
L'ELECTRICITE EN RESEAU

- The largest distribution grid in Europe
- The main distribution grid in France: **connected to 95% of the mainland metropolitan population** (the remaining 5% covered by ~170 local distribution companies)
- A **regulated business model**: ENEDIS has the national monopoly on 360 concession contracts following the gathering during the renewal
- Represents about **a quarter of EBITDA, investments and headcount** of EDF Group

French island activities (1)

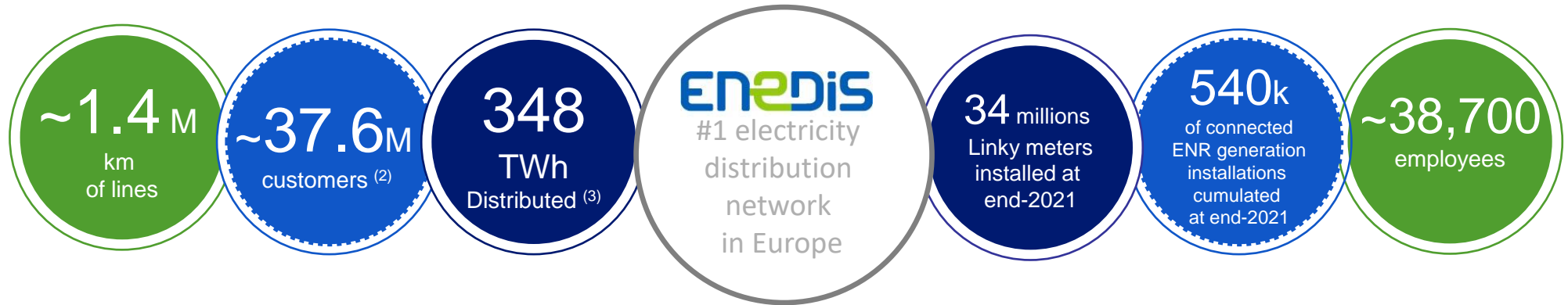
- **Integrated business model** including generation, electricity purchases, distribution (via concessions) and supply at the regulated tariff
- Grid activities: **similar remuneration to that of Enedis**
- Generation activities: for assets commissioned before 06/04/2020, remuneration of 11%. For assets commissioned after 06/04/2020, between 6.25% and 9.75%

es  
L'ELECTRICITE EN RESEAU

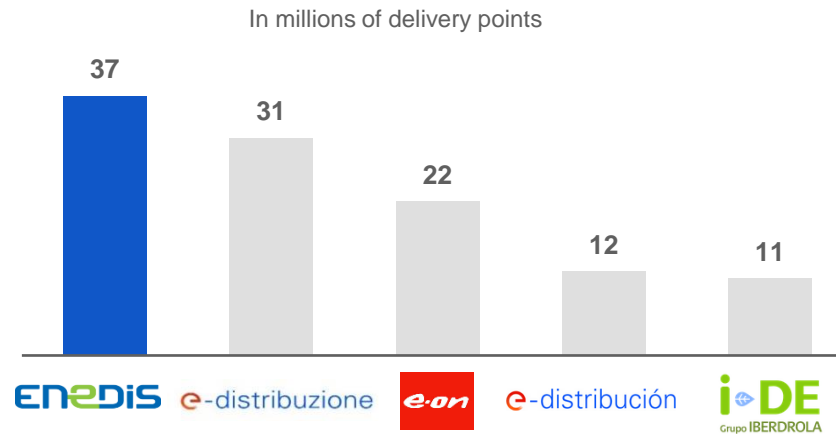
- **Grid of around 15,000 km** (Strasbourg region)
- **575 delivery points**
- Around 70% of EBITDA from regulated distribution activities

# ENEDIS<sup>(1)</sup> : DISTRIBUTION NETWORK LEADER IN EUROPE

MAJOR  
DISTRIBUTION  
NETWORK  
PLAYER IN  
EUROPE

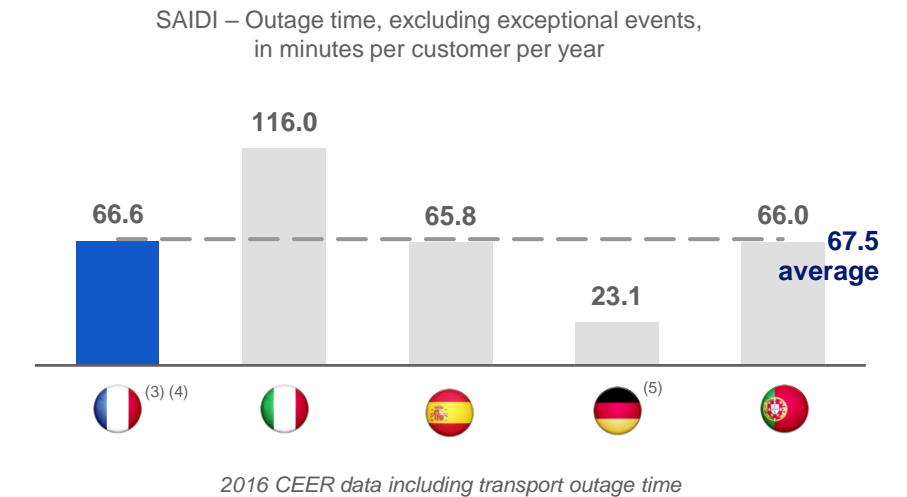


## ... in terms of number of customers ...



WELL  
POSITIONED VS  
PEERS...

## ... as in quality of supply



<sup>(1)</sup> Enedis is an independent EDF subsidiary as defined in the French Energy Code

<sup>(2)</sup> Corresponds to the number of delivery points

<sup>(3)</sup> Indicator including transport, excluding local distribution companies. The outage time in ENEDIS scope was 57 minutes in 2021

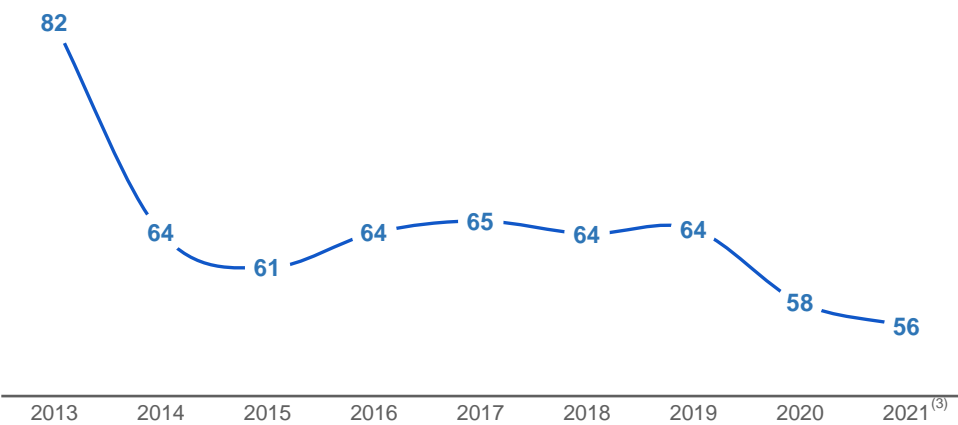
<sup>(4)</sup> World's smartest GRD

<sup>(5)</sup> Specific to Germany, whose network is much denser than in other countries

# ENEDIS <sup>(1)</sup> : TOP-TIER OPERATIONAL PERFORMANCE

## Top-tier operational performance...

Outage time <sup>(2)</sup>

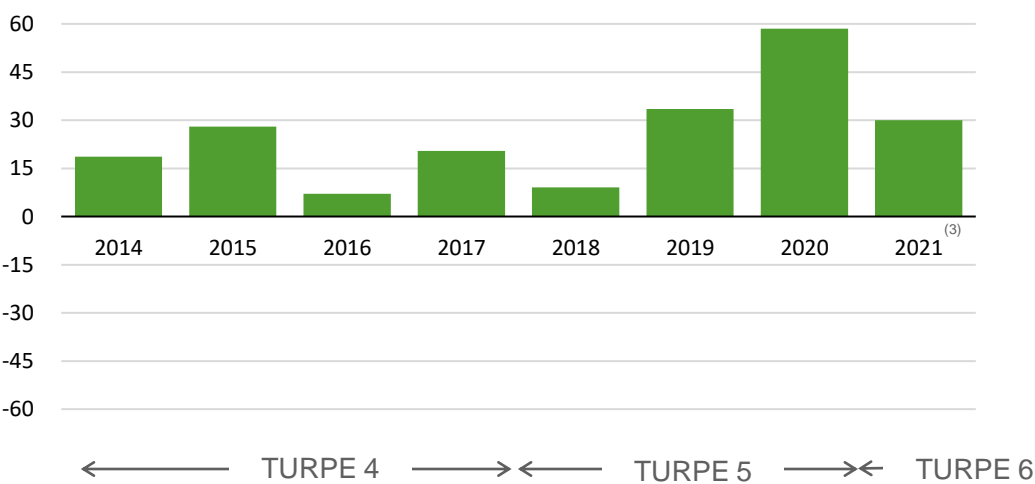


Lowest outage time for 2 years, at less than 60 minutes

(1) Enedis is an independent EDF subsidiary as defined in the French Energy Code  
(2) Excluding exceptional events and transport grid incidents  
(3) Provisional data

## ... which means it is frequently awarded the regulatory incentive bonus

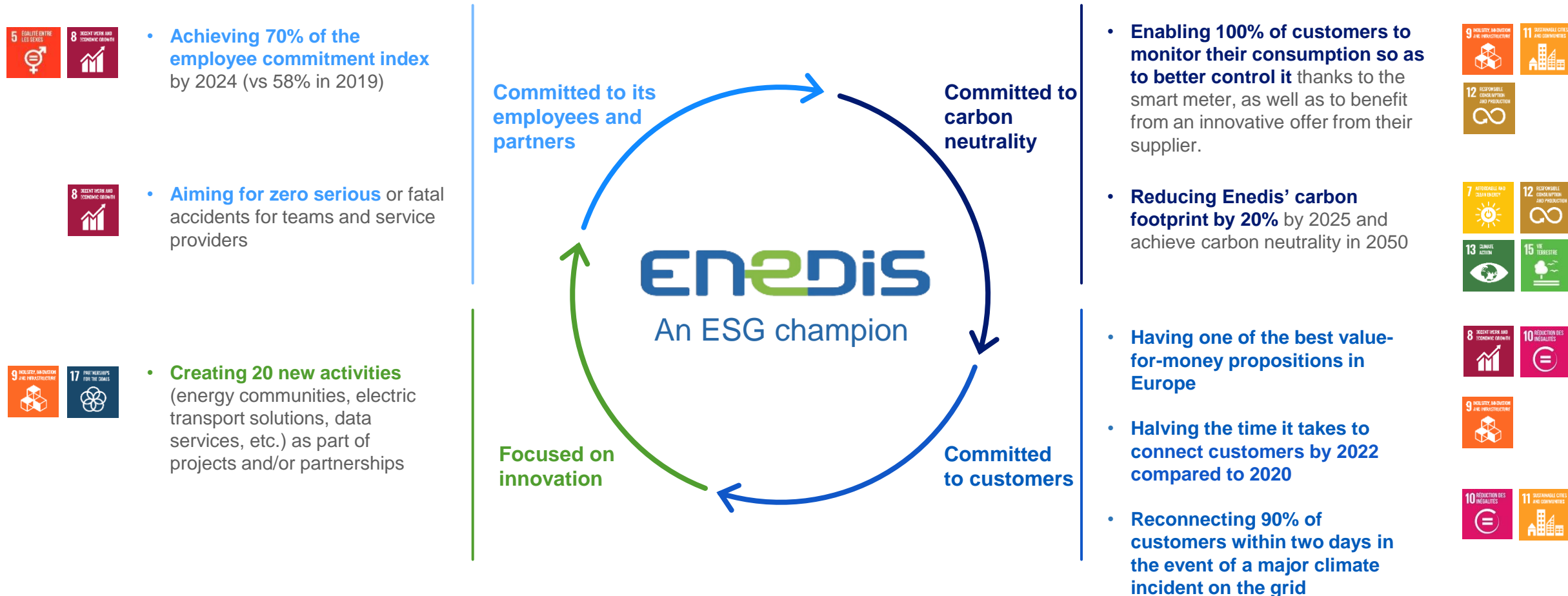
The regulatory incentive bonus has been systematically obtained since 2014 (in €m)



Increase in MIN/MAX from TURPE 5, from €80m for TURPE 4 to €194m for TURPE 5: this increases the remuneration potential in the event of good operational performance.

# ENERGY TRANSITION AT THE SERVICE OF THE TERRITORIES

## 2020-2025 INDUSTRIAL AND HUMAN PROJECT BASED ON EIGHT COMMITMENTS ALIGNED WITH UN OBJECTIVES



# TARIFF FOR USING THE PUBLIC ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS (TURPE) GENERAL PRINCIPLES

## ➤ TURPE is based on general principles...

- **“Postage stamp”**: network access pricing is dependent on distance
- **Tariff equalisation**: the same rates apply throughout the national territory
- **No discrimination**: tariffs reflect the costs generated by each category of users
- **Time-seasonality**: tariffs are designed to encourage customers to limit their consumption during peak periods

## ➤ ... complemented by criteria to best meet the expectations of stakeholders

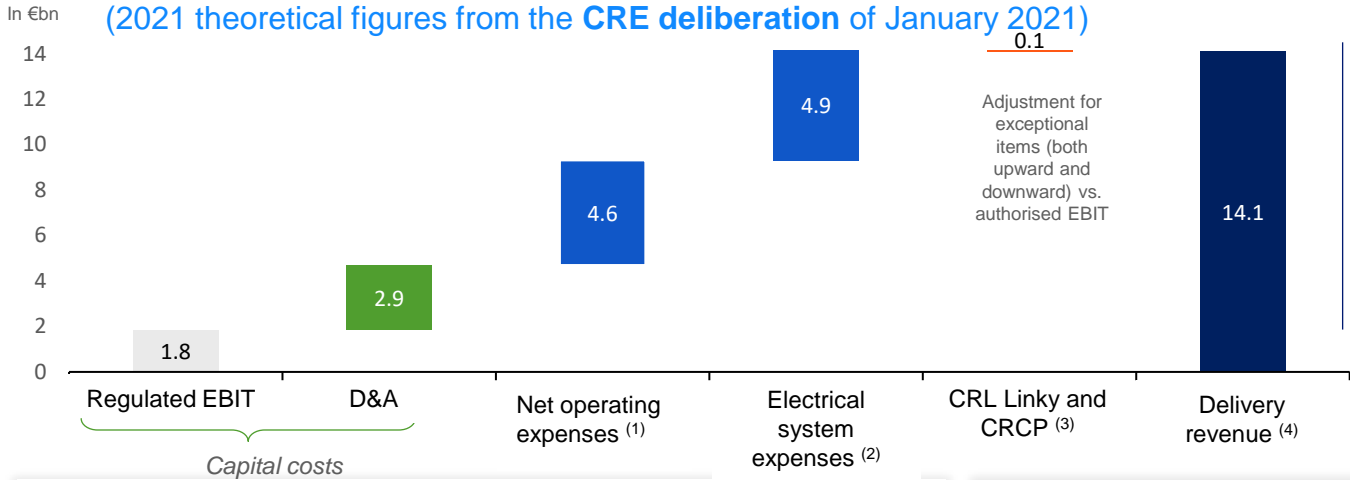
- **Efficiency**: the tariff signal leads users to modify their behaviour and encourages the reduction of costs over the long term
- **Readability**: level of complexity appropriate to the type of user and the voltage level considered
- **Feasibility**: tariffs must be able to be implemented
- **Progressivity**: a change in tariffs must generate progressive effects



# ENEDIS: TURPE 6, A MATURE REGULATORY FRAMEWORK



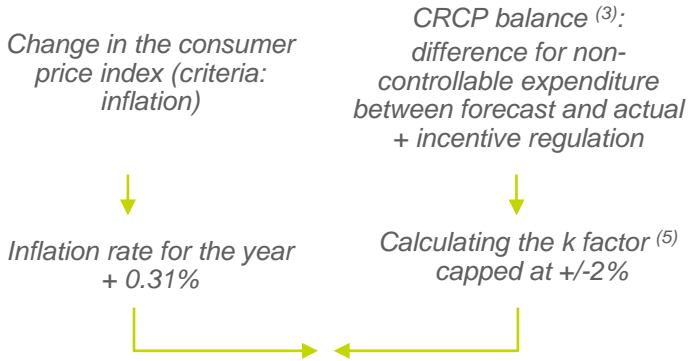
Key elements of the remuneration: a cost + remuneration approach  
(2021 theoretical figures from the CRE deliberation of January 2021)



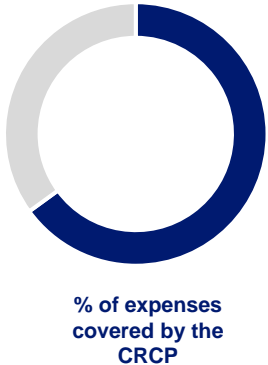
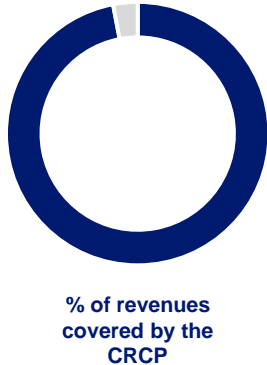
**No exposure to variations in distributed volumes** (number of customers, TWh distributed including weather impact) vs trajectory defined by the regulator

**Incentive regulation:** productivity gains, quality of service and continuity of supply, R&D and smart grids

## Tariff indexation principle (TURPE 6)



## Income and expense <sup>(6)</sup> largely secured by the mechanism of the Income and Expense Adjustment Account (CRCP):



(1) Net revenue excluding transport

(2) Power system charges = transport purchase from RTE + purchase of network losses

(3) CRCP = expense and income adjustment account; CRL Linky = Linky regulated levelling account (*Compte Régulé de Lissage* [CRL])

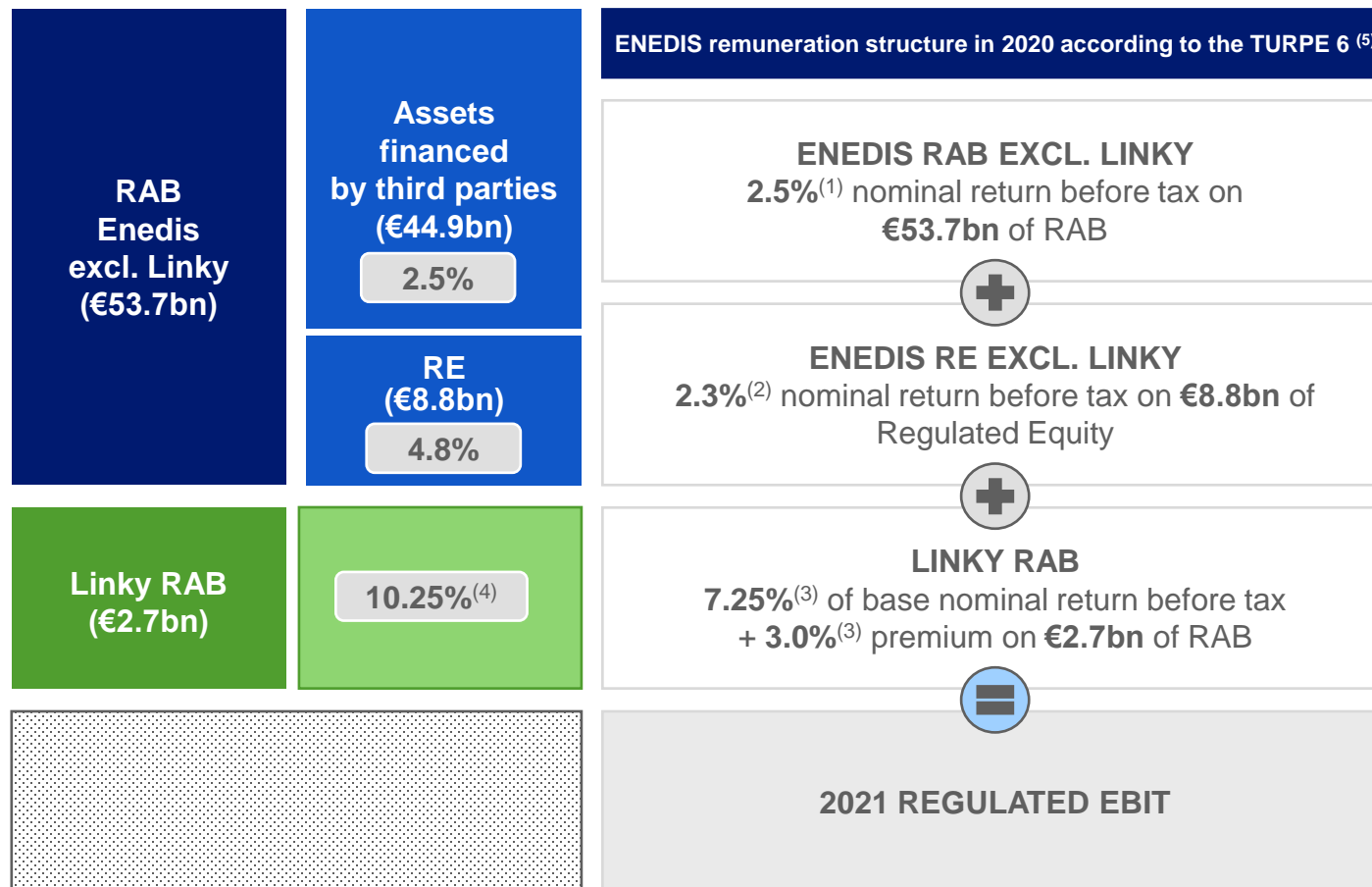
(4) French standard data. The difference with IFRS mainly corresponds to Enedis' contribution to the Electricity Equalization Fund

(5) k factor = percentage change in the fee table resulting from the clearance of the CRCP balance

(6) Capital charges + operating charges + electric system charges

# TURPE 6 REMUNERATION STRUCTURE: A FAVOURABLE RISK PROFILE

A remuneration mechanism based on a guaranteed return



## TURPE 6 in continuity with the previous TURPE

- **Return on capital depends little on interest rate trends: stable at 2.5%** since TURPE 4
- Return on **regulated equity**: decrease from **4 to 2.3%** to take into account the reduction of the risk-free rate and the corporate tax rate in France
- **CRCP: mechanism globally validated.** The entry CRCP of TURPE 6 represents a receivable of €588m <sup>(6)</sup> to be spread over the 4 years of TURPE 6
- **Incentive regulation: targets raised**, notably quality of service
- Main new features: **annual tariff indexation** includes **0.31%** remuneration above inflation.

01/01/2021 figures

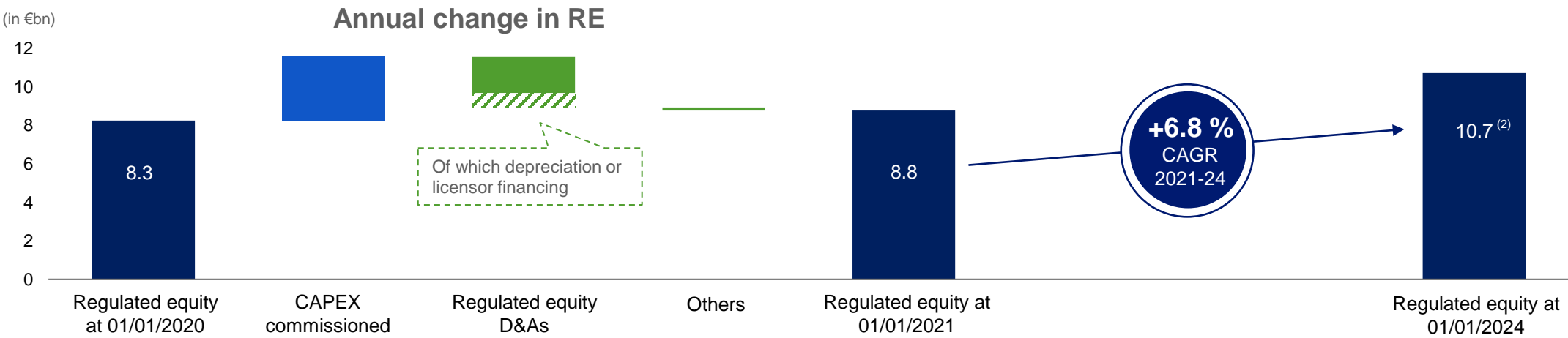
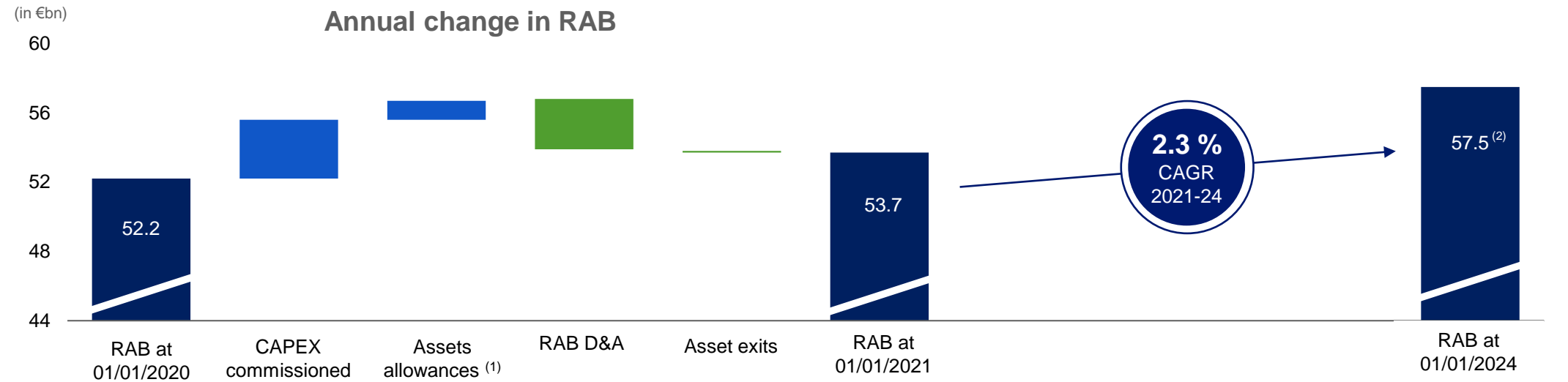
- (1) Asset margin = Asset beta x Market risk premium / (1 - tax rate) = 0.36 x 5% / (1 - 26.47%) = 2.5%
- (2) Additional rate of remuneration applied to RE = Risk-free rate / (1 - Tax rate) = 1.7% / (1 - 26.47%) = 2.3%
- (3) Remuneration rate for Linky assets = Base rate + expected remuneration bonus = 7.25% + 3% = 10.25%

(4) Assuming award of the expected remuneration bonus

(5) Applicable from 1 August 2021

(6) CRE deliberation

# STEADY GROWTH IN RAB AND REGULATORY EQUITY



(1) Work by concession-granting authorities and transferred to Enedis + c.€0.4bn for the integration of growing columns excluding concession in 2020 (ELAN law)

(2) Estimated figures from the CRE deliberation

# LINKY (1) : AN INCENTIVISING TARIFF FRAMEWORK

LINKY: THE  
ROLLOUT  
PROGRAM FOR  
NEW SMART  
METERS

34m  
customers  
equipped  
at end-2021

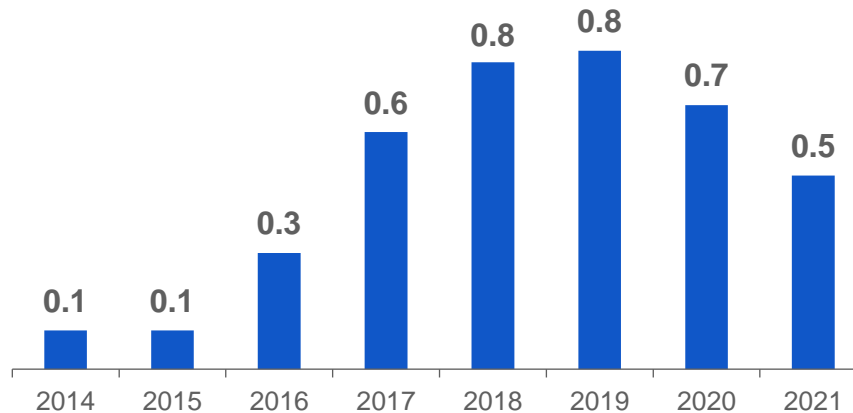
Target  
achieved



~€3.9bn <sup>(2)</sup>  
investments  
over 2014-2021

Specific  
regulation  
over  
20 years  
(Linky-  
dedicated  
RAB)

2014-2021 Investment pattern  
in €bn



## Linky – Remuneration

**7.25%**  
Nominal rate of return on assets  
before tax

**+**  
**3%**  
Additional premium <sup>(4)</sup>

→ Almost secured

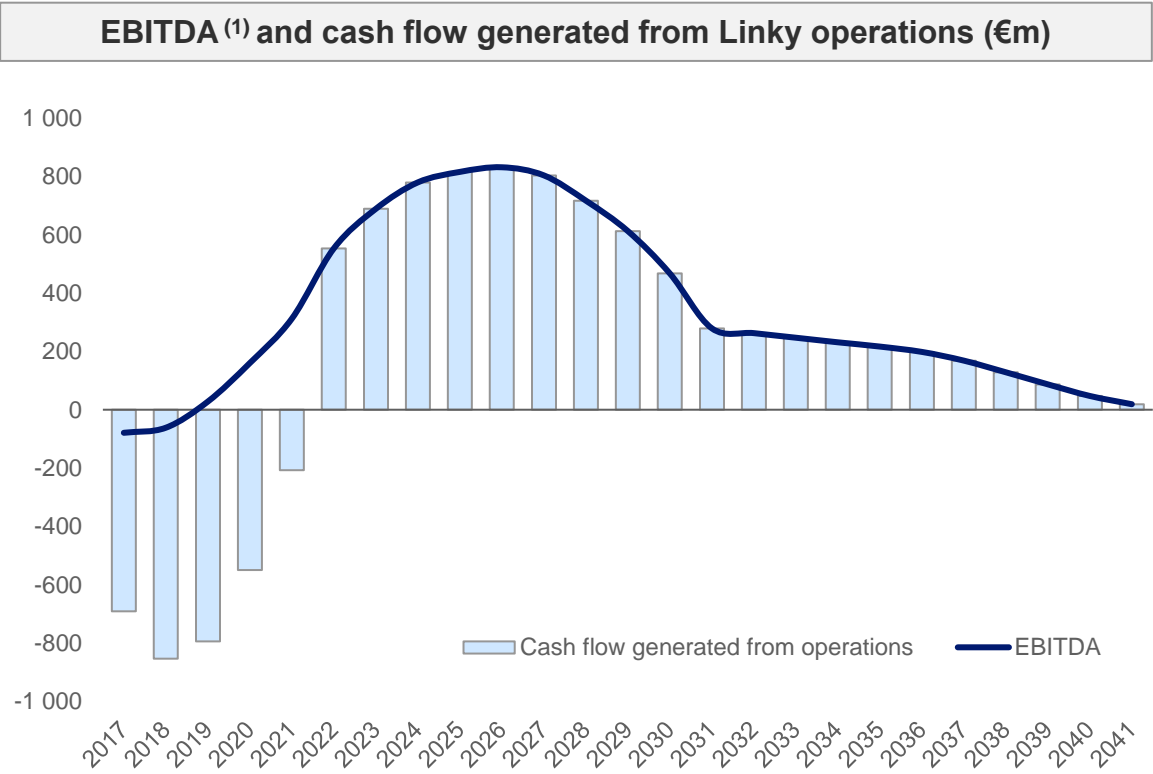
(1) Linky is a project led by Enedis, an independent EDF subsidiary as defined in the French Energy Code

(2) Program costs are lower than the initial budget, planned at €4.7bn

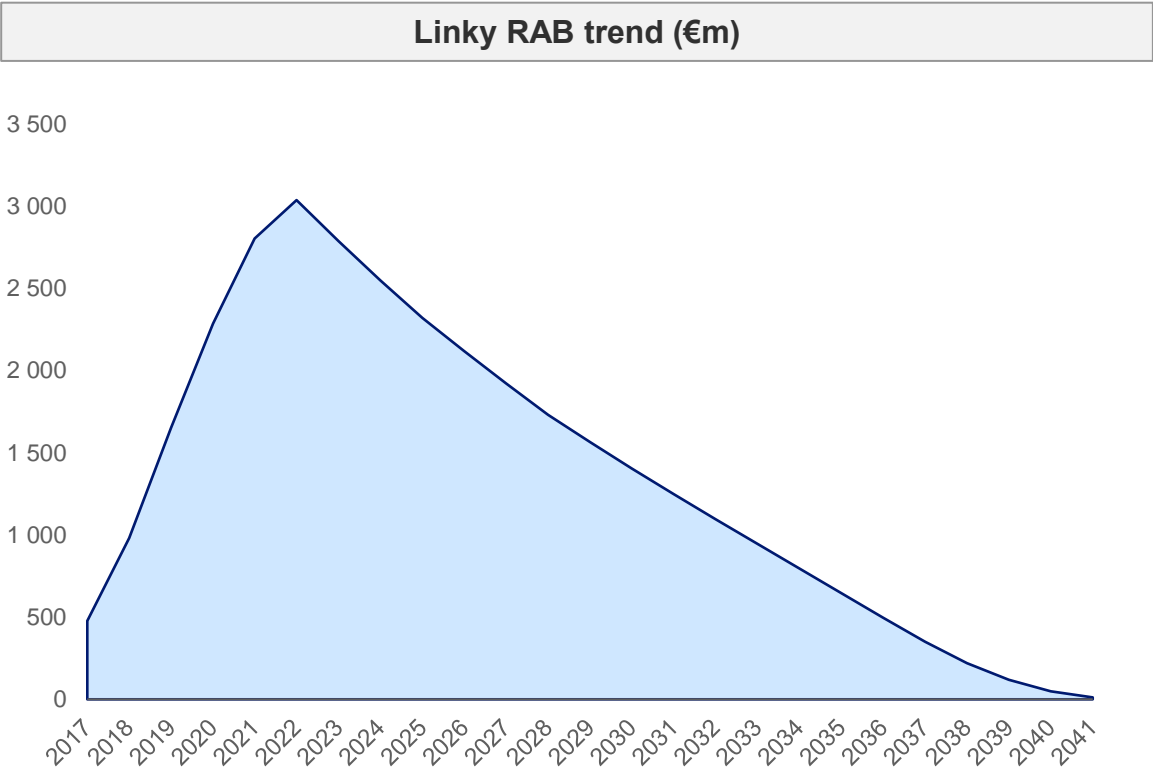
(3) Additional premium of 3% / Penalties of -2 %, depending on the respect of costs, deadlines and performance of the system during the deployment phase

# LINKY: A SIGNIFICANT CONTRIBUTION TO CASH-FLOW FROM 2022

## A significant contribution to cash-flow from 2022...



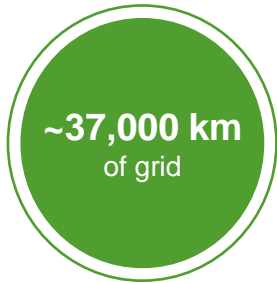
## ... in line with the Linky RAB trend



- Linky's cash flow is negatively impacted until 2021 as a result of the roll-out and the Regulated Deferred Account mechanism (CRL).
- Significant contribution from 2022 before peaking around 2025-2027

# ISLAND ACTIVITIES <sup>(1)</sup>: SPECIFIC REGULATION AND OPERATIONAL PERFORMANCE SUPPORTING STABLE REVENUES

MAJOR ASSETS  
AT THE HEART OF THE  
TERRITORIES

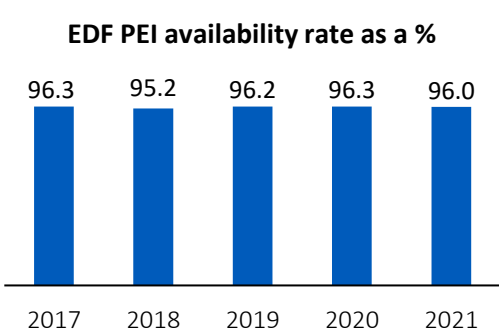


REGULATED ASSETS,  
OPERATED  
EFFICIENTLY,  
GENERATING A STABLE  
EBITDA

**Generation assets:** 11% remuneration for assets commissioned between 2006 and April 2020 (7.25% before) and then between 6.25% and 9.75% remuneration for assets commissioned in function of technologies and territories, excluding specific project

**Networks:** (FPE <sup>(3)</sup>)

- 4.8% return on regulated equity (€0.9bn)
- 2.5% remuneration on the RAB (€2.6bn)



**Normalised EBITDA \***

Range of €780M / year \*\*

\* Restated for the effect of the regularisation account <sup>(4)</sup>

\*\* o/w about a third related to grid activity, and excluding regularisation account

A CONTRIBUTION TO  
THE ENERGY  
TRANSITION IN ZNI <sup>(2)</sup>

**Smart meter programme:** install and operate 1.2 million smart meters by end 2024. Around 715k smart meters were already installed and operated by the end of 2021: roll-out on schedule.

**Energy efficiency:** sustainable energy-saving measures (insulation, solar water heaters, etc.)

**Decarbonation:** integration of renewable energy sources, development and operation of ~30 smart grids, electrification programme in isolated areas. Conversion to liquid biomass of the power plants operating in Port Est, Pointe Jarry and Bellefontaine, as well as the future Larivot plant.

<sup>(1)</sup> French island electrical activities include Corsica, Martinique, Guadeloupe, French Guiana, Réunion and Saint Pierre and Miquelon

<sup>(2)</sup> ZNI = non-interconnected zones

<sup>(3)</sup> FPE: Electricity Equalization Fund [*Fonds de Péréquation de l'Electricité*], current four-year period from the beginning of 2022 to the end of 2025

<sup>(4)</sup> CRCP of the FPE



# ÉLECTRICITÉ DE STRASBOURG

~ 1,300 employees / €871m in Sales / €59.1m in Net Result

ÉS is an Alsatian energy producer which is committed to long-term energy and economic performance of its territory through its four activities:

- **Electricity distribution** (Strasbourg Électricité Réseaux)
  - 15,000 km of lines (including 740 km in HVB) in more than 400 Alsatian municipalities
  - 575,000 delivery points and 5,700 injection points (6.9TWh distributed)
- **Fourniture d'énergies** (ÉS Énergies Strasbourg)
  - 563,000 customers for electricity (5.2TWh) and 113,000 for gas (4.5TWh)
  - Associated services (corrective maintenance, digital services), and around energy transition (self-consumption, energy efficiency and electric mobility)
- **Energy services** (ÉS Services Énergétiques)
  - Realisation and operation of installations: homes, healthcare, the tertiary sector and industry
  - Operation of the three large-scale heat networks of Strasbourg city and 2,500 thermal installations
- **Renewable energy generation: 408GWh (290GWh<sub>ff</sub> and 118GWh<sub>e</sub>)**
  - **Deep geothermal:** 171GWh fossil-fired and 6 GWh electric (2 plants)
  - **Biomass:** 119GWh fossil-fired and 62GWh electric via one cogeneration plant
  - **Hydropower:** 46GWh (4 hydropower plants, and a 35% share in SEHRY (15 hydropower plants))



## 120 ans d'ancrage local

1899 : Creation of ÉS

1927 : Stock listing

2009 : Development of the supply activity (ÉS Énergies Strasbourg)

2012 : Acquisition of the local gas supplier ("Gaz de Strasbourg" brand)

2016 : ÉS becomes ENR producer

- 2 Deep geothermal plants
- Biomass cogeneration on heating network at Strasbourg

2017 : Development of the distribution activity (Strasbourg Électricité Réseaux)


2017 : Launch of the Illkirch Graffenstaden geothermal project

2018 : Equity investment (34%) in EMEM SEM (Erstein ELD)

2019 : Commissioning of the hydropower plant in Alsace (Framont) and a solar facility in Mundolsheim

2021 – 2026 : generalised roll out of Linky™

# EDF GROUP MAIN BUSINESSES



➤ NUCLEAR	P. 77
➤ RENEWABLES	P. 112
➤ THERMAL POWER	P. 133
➤ REGULATED ACTIVITIES (NETWORKS)	P. 136
➤ <b>OPTIMISATION &amp; TRADING</b>	<b>P. 150</b>
➤ CUSTOMER SOLUTIONS	P. 166
➤ ENERGY SERVICES	P. 181
➤ GAS	P. 188

# OPTIMISATION AND TRADING: LEVERAGING THE VALUE CHAIN

The main role of the optimiser is to:

- **ensure the balancing** between EDF's upstream resources and markets in France,
- **secure and maximise the gross electricity margin** of the “generation-supply” set by constantly seeking the best opportunities to buy or sell on the wholesale markets.

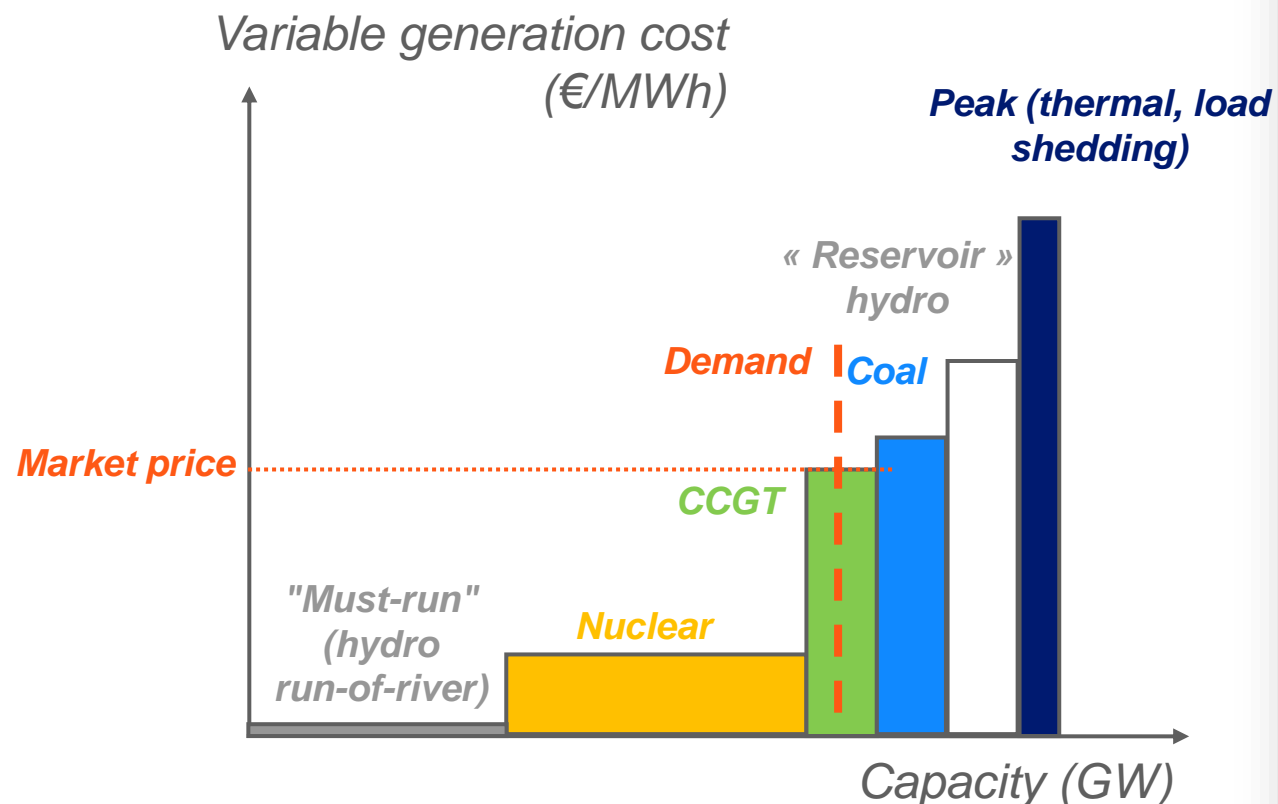
**Upstream resources:** generation fleet, purchases on wholesale markets, contractual demand-side response capacity

**Markets:** sales to end customers, long-term supply contracts, sales on wholesale markets, sales to competitors in France (ARENH), partnership contracts

The optimizer programs the use of physical assets, secures gross electric margin of the set “production consumption”, operates on the wholesale market (through EDF Trading)

The supply-demand balance is forecasted for each time horizon

# DAILY OPTIMISATION: THE MERIT ORDER



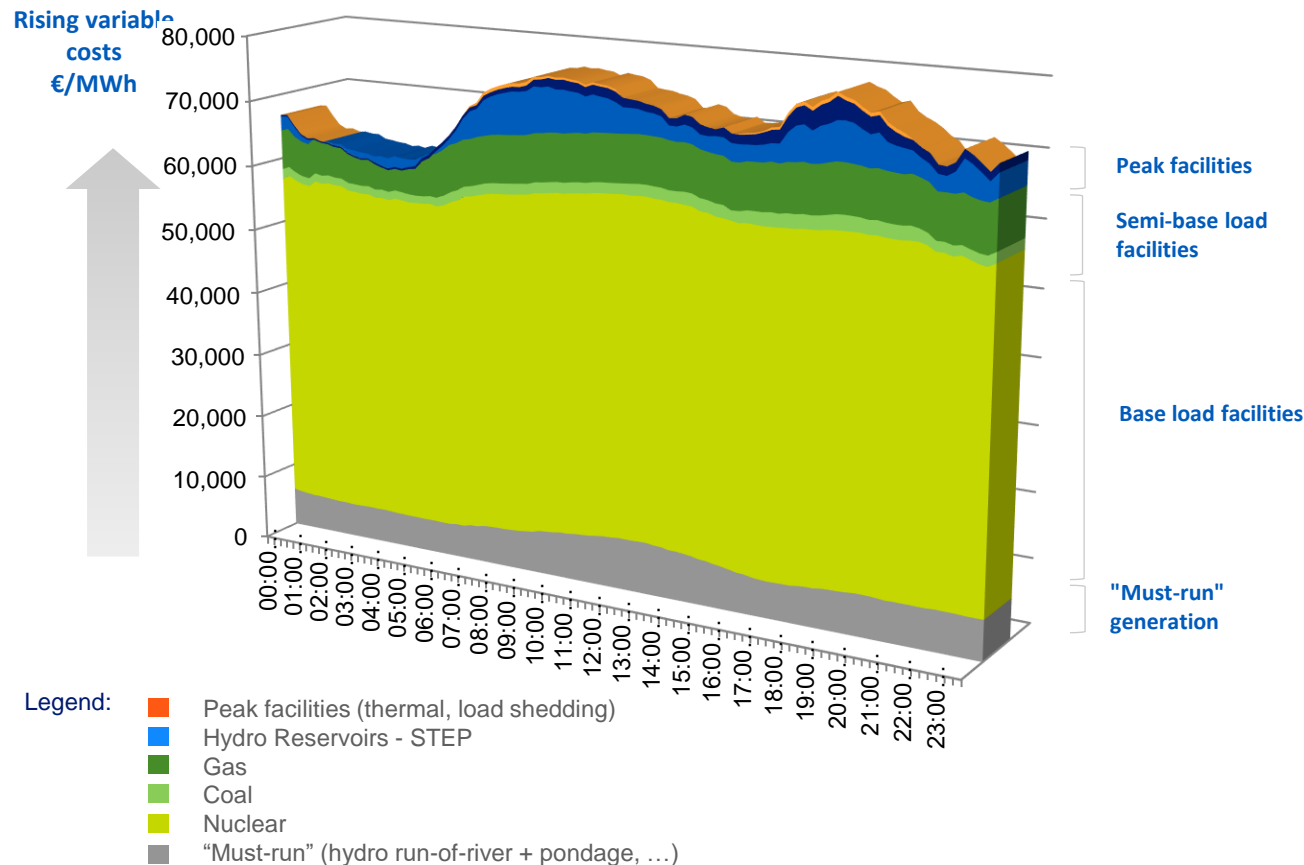
- **For each moment**, the optimiser schedules the operation of available means of generation, mobilising them according to the merit order of variable costs<sup>(1)</sup> until the estimated demand is met
- Before using the market, each producer determines the resources required to meet a given level of demand. It classifies them from the least expensive to the most expensive
- It then determines the marginal cost, which is the variable cost of the most expensive means of generation called to meet the supply/demand balance of its own portfolio
- Given this marginal cost, it determines the sales and purchases volumes
- Spot power price (day ahead) is based on the marginal cost that forms the intersection of the supply of all producers with the overall demand to meet

(1) Variable costs: operating costs proportional to the generated energy, fuel costs, CO2, costs of injection into the grid

# COST OPTIMISATION – SCHEDULING OF GENERATION FACILITIES BASED ON VARIABLE COSTS

## Stack chart of generation facilities

Example of one high consumption day in winter in France



➤ Every day, the optimiser sets up for the next day the functioning tool of the generation facilities, taking into account their dynamic constraints and the **merit order** (see previous slide)

# EDF TRADING, ACCESS PLATFORM TO WHOLESALE ENERGY MARKETS



**EDF Trading 2021 EBITDA**

**€1200m**

**Did you know?**

EDF Trading also operates in the Japanese Power market and has established a trading desk in Tokyo

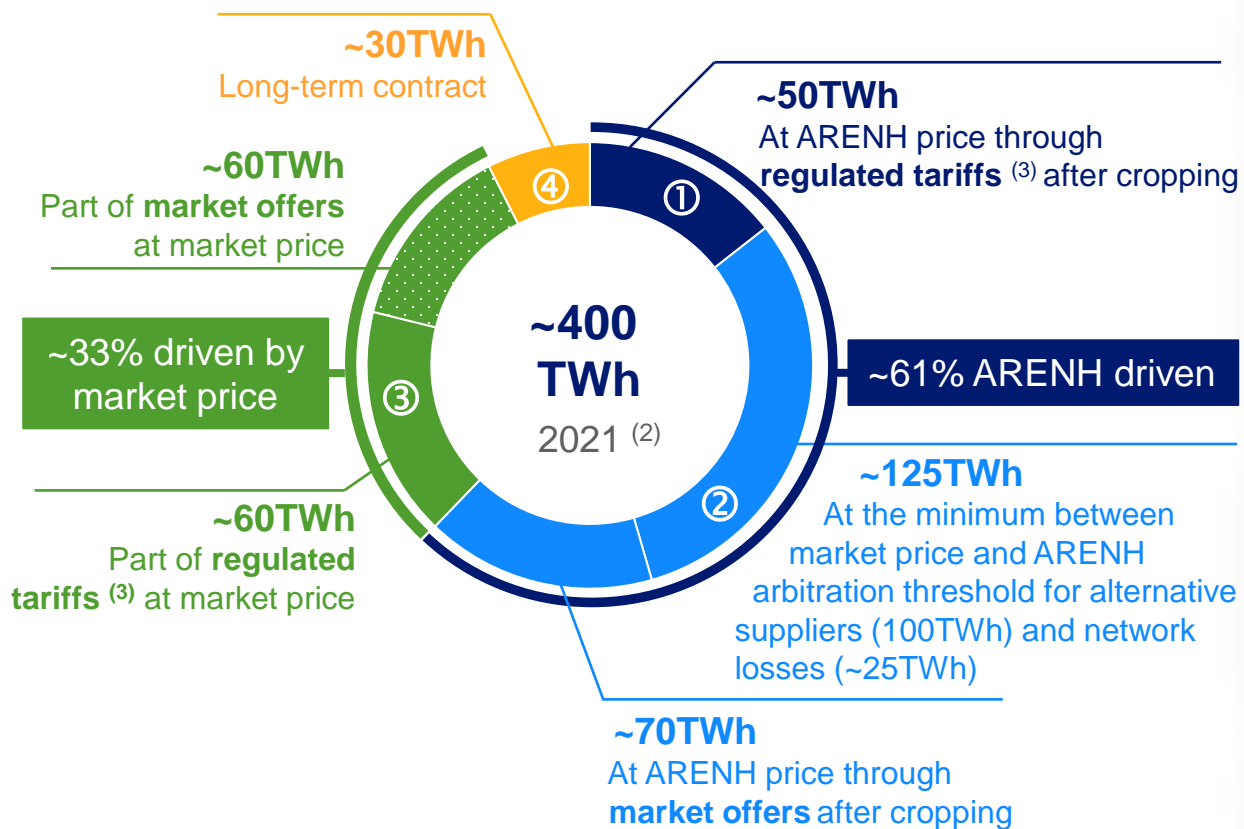
EDF Trading has a diverse portfolio of carbon offset projects around the world to support EDF Group and third-parties with their decarbonization commitments

## Well positioned with a broad geographical presence

- 
- One of the largest sellers of gas and electricity in North America
  - A leading player in the European gas and electricity markets
  - Growing global LNG trading in the Atlantic and Pacific Basins through its partnership with JERA



# DISTRIBUTION OF ELECTRICITY SALES <sup>(1)</sup> ACCORDING TO THEIR MARKET PRICE EXPOSURE



**1** Volumes sold at the ARENH price following the cost-stacking formula in the regulated sales tariffs (essentially blue residential and non-residential tariffs)

**2** Volumes sold at the market price if this price is lower than ARENH arbitration threshold (ARENH price - capacity price) and ARENH price otherwise <sup>(4)</sup>, which include:

- The ARENH volumes that can be requested by alternative suppliers and network operators for their purchases of losses
- Part of the volumes <sup>(5)</sup> sold to EDF final customers under market-based contracts

**3** Volumes sold at the market price, whatever the price, which include:

- Part of the volumes sold to EDF final customers: “market complement supply” in the regulated tariffs <sup>(6)</sup>, balance of the volumes sold to clients under market-based contracts
- Volumes sold on wholesale power markets

**4** Contracts at negotiated prices that do not follow a market-indexed structure

(1) Sales excluding purchase obligations volumes and volumes under long-term supply contracts. Estimated distribution based on the situation in 2021, in particular in terms of EDF downstream market shares. In 2021, the level of cropping corresponding to ARENH over subscription (146.2TWh) by alternative suppliers has been applied to downstream offers

(2) Full year estimate, rounded to the nearest tenth TWh

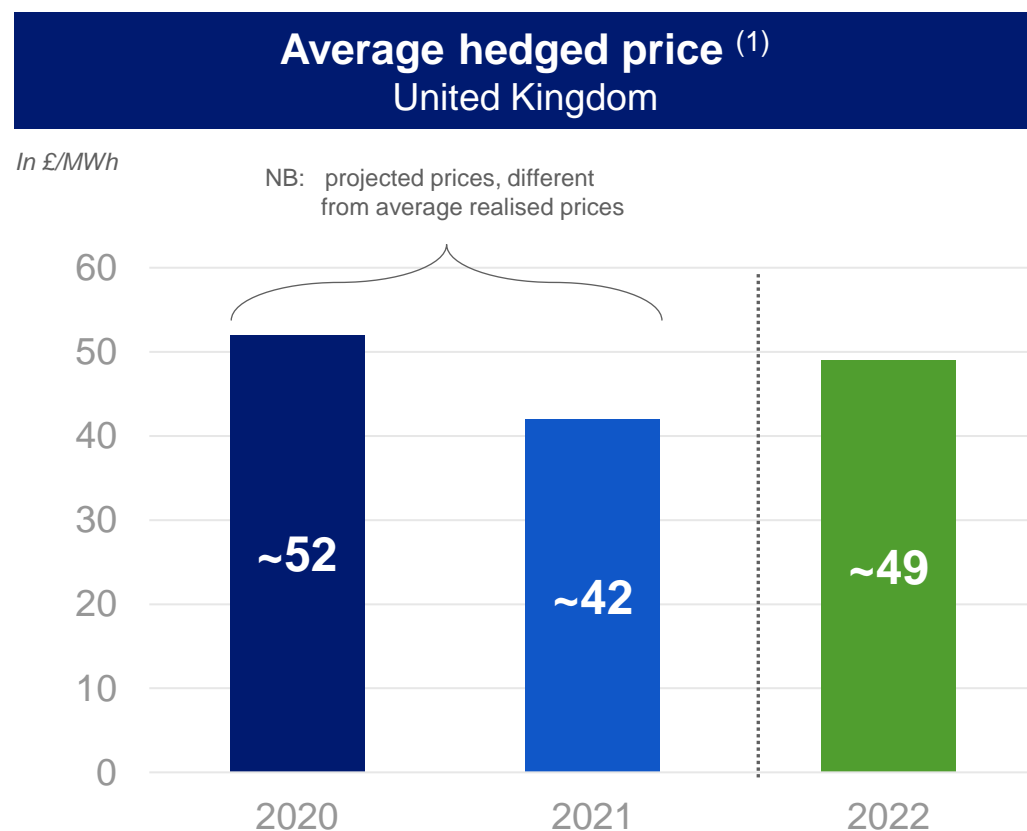
(3) Regulated electricity sales tariffs

(4) EDF is subjected to the arbitrage between the two prices and its date of exercise is variable depending on the volumes (it takes place at the latest at the time of the ARENH end of year subscription window for a delivery the following year)

(5) Related to the replication of the sourcing cost structure of alternative suppliers: shares of the volumes corresponding to the “ARENH rights”

(6) Related to the replication of the sourcing cost structure of alternative suppliers: the balancing volumes sourced on the market which exceed the “ARENH rights”

# EDF ENERGY: ESTIMATED AVERAGE FORWARD HEDGED PRICE



Average price captured through hedging activities in relation with wholesale prices before the beginning of the delivery year <sup>(2)</sup>

Estimation based on:

- Notional generation volumes
- Season contracts prices

This average price does not take into account purchases and sales on wholesale markets that may take place during the delivery year depending on unexpected generation events.

**It is not the average realised sale price.**

(1) Rounded to the nearest whole number. Excluding revenue associated with capacity certificates.

(2) Based on a principle of gradual closing of net positions before the end of the delivery year, based on a predefined hedging trajectory in view of liquidity constraints on the forward markets

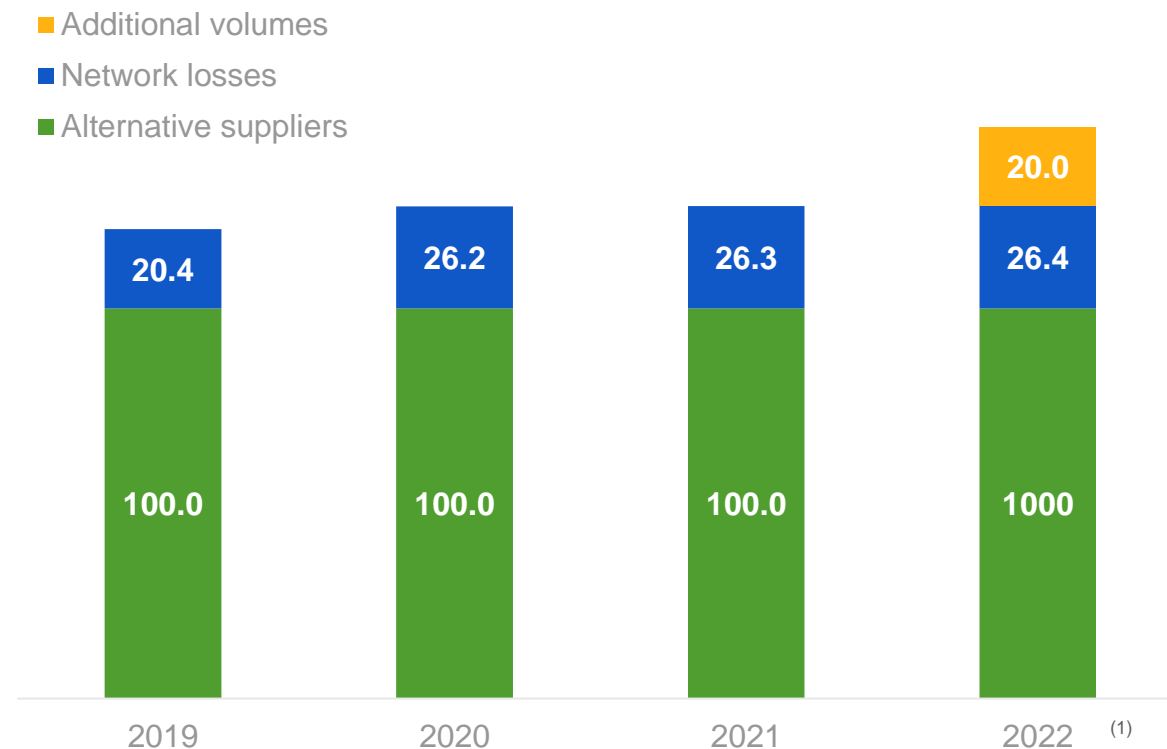
# ARENH: CURRENT MECHANISM

- The **regulated access to historic nuclear power** (ARENH) mechanism entered into effect in 2011 to allow alternative suppliers who make the request, for the supply to end customers, to benefit from a supply “under economic conditions equivalent to those for EDF resulting from the use of its nuclear power plants” through an annual product, which may be requested twice a year (in November and May), within the limit of an annual ceiling of 100TWh (excluding network losses). This mechanism is also open to network operators to cover their technical losses. The Energy Regulation Commission (CRE) is responsible for managing the mechanism and calculating the quantities of which it informs the alternative suppliers individually, and EDF in an aggregated manner
- **The ARENH price has been fixed at €42/MWh** since 1 January 2012<sup>(1)</sup>. Since 2017, the delivered product includes 1MW of capacity certificates per megawatt of subscribed ARENH
- **The law of 8 November 2019 on energy and climate** granted the ministers responsible for the economy and energy the power:
  - to set by decree the ceiling of the ARENH, as of 2020, within the limit of 150TWh; this ceiling having to be set “with the aim of contributing to price stability for the end consumer”;
  - until the entry into force of the decree establishing the method for calculating the ARENH price, to set the ARENH price by decree; among the elements that may be taken into account to revise this price are in particular the changes in the consumer price index and the ARENH ceiling.
- **With regard to 2020 and 2021, the government stated that the conditions for fulfilling this option had already been discussed with the European Commission** (any change in ARENH parameters, such as raising the ceiling, even with no change to the price, requiring a change to its decision of 2012 approving ARENH) **and the question of a change to ARENH parameters would be asked according to the result of the negotiations under way with the European Commission in the future regulations of the existing electro-nuclear fleet**, reiterating that French consumers continue to benefit through ARENH from protection against market price increases despite the ceiling effect.
- **With regard to 2022**, to address the strong increase in prices on the European wholesale electricity market driven sharply upwards by global gas prices and, to a lesser extent, by the CO2 price, and also impacted by the prospect of the diminished availability of the nuclear fleet, **the government capped the increase in regulated sales tariffs (RSTs) for electricity at 4% (including VAT) on 1 February 2022** (by reducing the TICFE tax on the final consumption of energy and setting the RST so as to respect an average increase of 4% (including VAT), accompanied by a tariff catch-up in 2023) **and announced an exceptional allocation of an extra 20TWh of ARENH in 2022** (beyond the 100TWh ceiling). In its press release dated 13 January 2022, EDF estimated the impact of these measures on its 2022 EBITDA, given the information currently in its possession, at around €8.4bn on the basis of market prices at 31 December 2021. In its press release dated 14 March 2022, EDF has re-evaluated this impact on its 2022 EBITDA at around €10.2 billion on the basis of the terms and conditions defined in Decree No. 2022-342 of 11 March 2022, given the information currently in its possession.
- **A structural reform, however, remains necessary to ensure a balanced regulatory framework for the current nuclear facilities**, particularly with regard to the remuneration of the generation affected by ARENH and its asymmetrical nature. Pending such reform, ARENH adjustments are welcome in order to stabilise in RSTs the price impact of the capping of ARENH and to factor in the decrease in nuclear output.

# ARENH: VOLUMES ALLOCATED TO ALTERNATIVE SUPPLIERS

- Historical situation: maximum annual sales volume of 100TWh <sup>(1)</sup> by EDF to alternative suppliers and 26.4TWh for network losses coverage
- In November 2021, ARENH requests from alternative suppliers for 2021 amounted to 160TWh.
- 13 January 2022: announcement of an additional exceptional allocation of 20TWh of ARENH volumes for 2022 <sup>(2)</sup>, for the period from 1 April to 31 December 2022 at €46.2/MWh, in addition to the exceptional measures dedicated to limit the electricity price increase in 2022,
- Volume sold for 2022 (including 26.4TWh sold for network losses coverage): 126.4TWh of which 20TWh will be added as of the exceptional increase announced the 13 January 2022

VOLUMES ALLOCATED IN TWH



Source: CRE

(1) The Energy and Climate Change law of November 2019, provides the government with the possibility of raising the cap for global maximal volumes via a ministerial order, from 100 to 150TWh as of 1 January 2020. The law also allows the government to revise the ARENH price.

(2) According to the decree of 12 March 2022

# ARENH: FORCE MAJEURE LITIGATION

- Due to the Covid health crisis, some suppliers have asked the Presiding Judge of the Paris Commercial Court to order, as a matter of urgency, the total suspension of deliveries of volumes from ARENH and/or their partial suspension up to the amount of the drop in electricity consumption of their customer portfolio during the crisis, invoking the *Force Majeure* clause provided for in the ARENH framework agreement concluded with EDF.
- The Summary Judge has decided that the conditions for *Force Majeure* have been met and has ordered EDF not to oppose the suspension of the agreement, entailing thereby the total interruption of the annual electricity transfer program.
- EDF has appealed the ruling. On 28 July 2020, the Paris Court of Appeals upheld the urgent application judge's decision, considering that the *Force Majeure* clause in the framework agreement has an automatic effect and that *Force Majeure* could not be excluded with the evidence required in summary proceedings. EDF filed an appeal on 24 September, which is still pending before the Cour de Cassation (the highest court of appeal).
- To safeguard its rights, EDF announced on 2 June the termination, as a precautionary measure, of the ARENH contracts binding it to these energy suppliers, as provided for in the event of a suspension of these contracts beyond a two-month period. Total Energie contested this termination before the judge in charge of summary proceedings. The latter ruled on 1 July 2020 and provisionally suspended the effects of EDF's termination announcement. EDF has appealed this ruling. On 19 November 2020, the Paris Court of Appeals overturned the ruling of the summary judge.
- These rulings were taken under an urgent procedure, on a provisional basis; only procedures on the merits will make it possible to establish definitively the merits of the respective positions of the parties.
- As of today, some alternative suppliers have introduced full civil proceedings against EDF with the Paris Commercial Court with a view to obtaining compensation for damages supposedly resulting from EDF's refusal to suspend ARENH deliveries on the basis of force majeure. On 13 April 2021, the Paris Commercial Court handed down an initial ruling ordering EDF to pay €5.88 million in damages and interest to an alternative supplier. The Court considered that the conditions of force majeure were met and concluded that EDF had committed a contractual breach for which it is liable by failing to suspend the delivery of ARENH volumes. On 30 November 2021, the Paris Commercial Court handed down two new judgments on the merits consistent with the position it had expressed on 13 April 2021. It ordered EDF to pay two alternative suppliers €53.93m and €1.77m respectively in damages and interest. EDF appealed these rulings.
- EDF appealed against the ruling before the Paris Court of Appeal.
- Other procedures are ongoing.

# PURCHASE OBLIGATION AND SALE ON WHOLESALE MARKET

Public service mission: EDF and the LDCs<sup>(1)</sup> must buy electricity generated by certain electricity generation facilities (or pay them an "additional remuneration") whose development the French government would like to encourage, at rates set by the government (by decree or through tenders)

Pursuant to Article L. 121-7 of the French Energy Code, EDF is compensated for the additional costs resulting from the purchase obligations (PO) on the basis of a reference to prices from wholesale electricity markets, known as "avoided cost" (compensation). Starting from 1 January 2017, the costs of managing these contracts are also compensated.

## ➤ EDF-Purchase obligations:

According to the CRE ruling of 16 December 2014, the energy of purchase obligations is resold on the markets:

- the near certain component (*i.e.* predictable over the medium term) directly by tenders under transparent and non-discriminatory conditions
- the variable component (*i.e.* predictable for the day ahead) on EPEX Spot via EDF Trading (in the dedicated book).

Since the capacity mechanism has been set up, EDF has in charge the certification of the facilities under the purchase contract and resells these capacities at the auctions (nearly 6GW)



446,000

Managed contracts  
Annual growth:  
+25,000 contracts



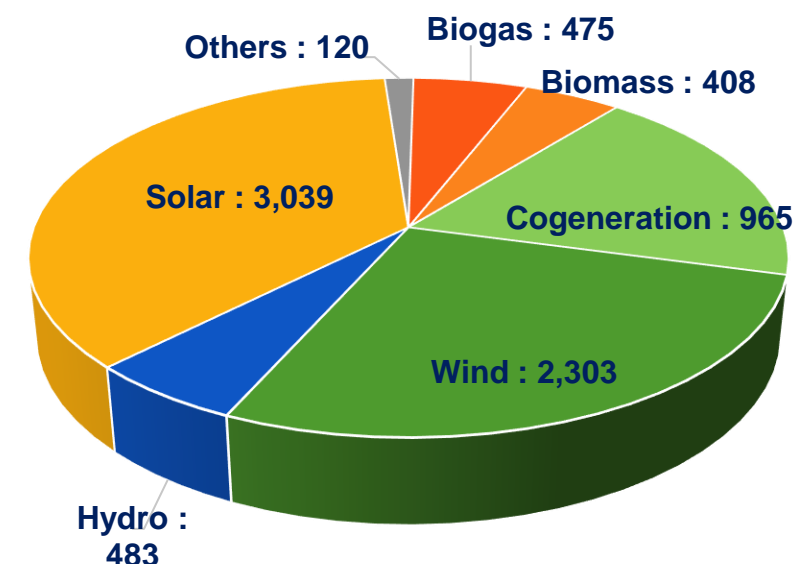
~€52m

in management  
fees for EDF

2021  
Key  
figures<sup>(2)</sup>

OA	CR
56.6TWh of purchased electricity	7.9TWh of sustained electricity
€8.4bn of purchases	€38m of support paid

## Purchasing breakdown by sector in 2021 (in €m)

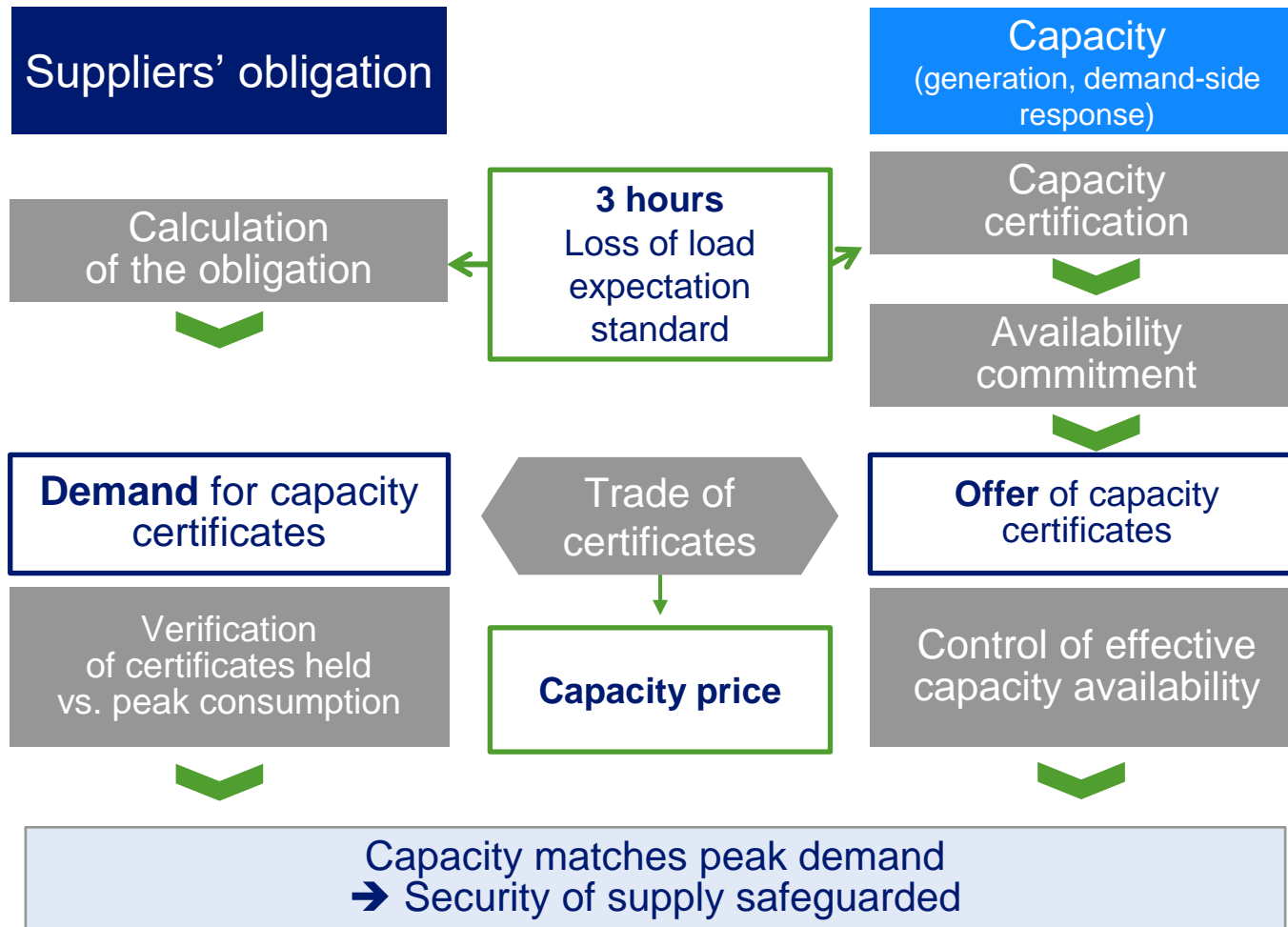


(1) Local distribution company

(2) Excluding Corsica and French overseas departments



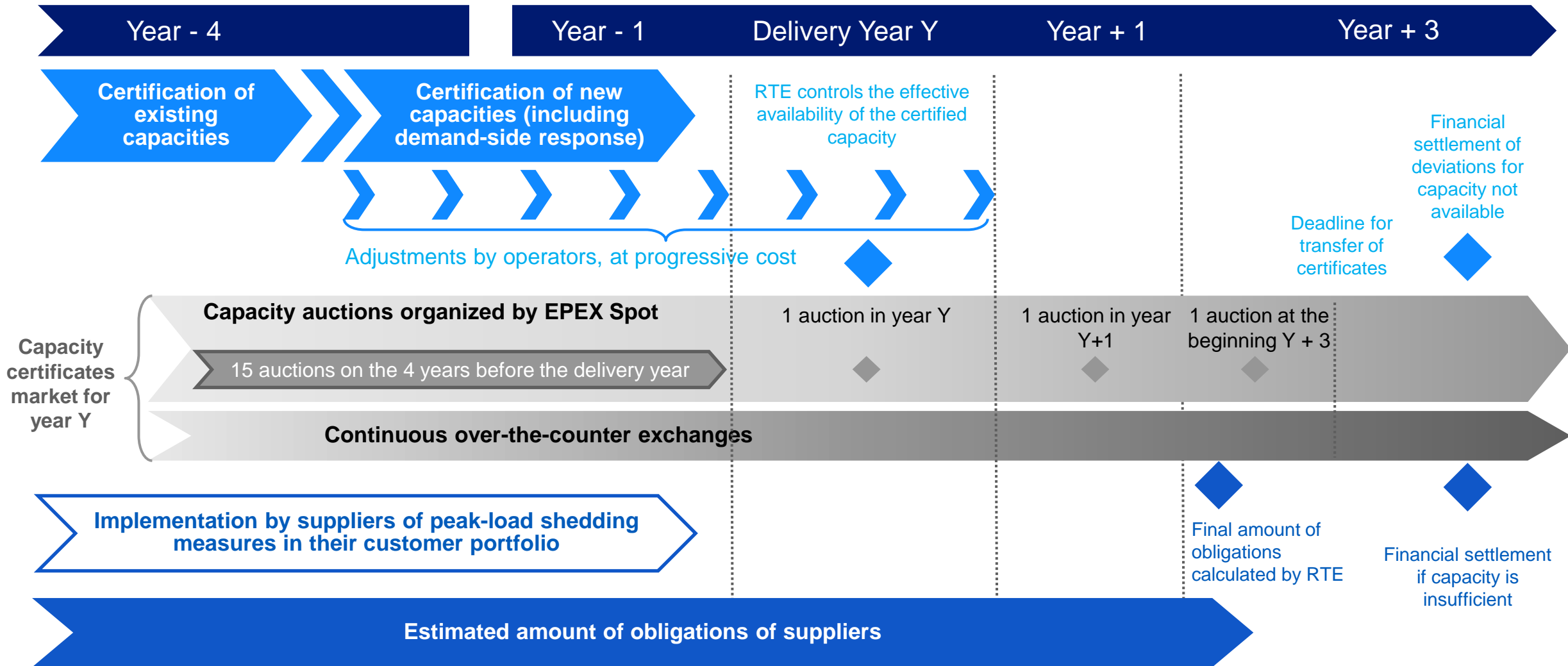
# CAPACITY MECHANISM IN FRANCE: PUT IN PLACE IN 2017



- Established by the NOME law, approved by the European Commission on 8 November 2016
  - Objective: to remunerate the means of generation and load shedding useful to security of supply
  - Definition of the criterion of security of supply by the public authorities: 3 hours of shedding on average per year
- Operated by RTE
  - Definition of calculation methods and identifying peaks
  - Issue of capacity certificates, control and management of capacity registry and settlement of gaps
  - Ex-post calculation of each supplier's obligations and the actual availability of certified facilities
  - Provision of information on supply and demand for certificates

(1) Source: DGEC, RTE

# CAPACITY MECHANISM IN FRANCE: STANDARD CALENDAR



Source: RTE

# CAPACITY MARKET: THEORETICAL YEAR <sup>(1)</sup>

Valuation method for certificates	Timing of EBITDA impact	Certificates concerned	Price	Volumes concerned <sup>(2)</sup>
<b>Generation</b>				
Certificate sales on the market (via auctions or OTC, up to 25% of volumes must be proposed during auctions)	At the time of closing of the transactions	Any certificate	Auction price (or negotiated price for OTC sales)	~ 15GW for DY+1 ~ 15GW for DY+2
Internal sales to the obligated actor (o/w ARENH share of supply contracts and tariffs)	None	Any certificate	N/A	~ 15GW by DY
Non-monetised transfers relating to ARENH volumes	None	Certificates for delivery year Y+1	0	~ 15GW by DY
<b>Supply</b>				
Certificate purchases on the market (via auctions or OTC)	None (entry into stock)	Any certificate	Auction price (or negotiated price for OTC sales)	~ 30GW by DY (~15GW for DY+1 and ~15GW for DY+2)
Outflow from stock of volumes purchased	At the time of energy delivery	Certificates for delivery year Y	Calculated from auctions prices	~30GW by DY (~15GW for DY-1 and ~15GW for DY-2)
Pass through of the capacity price to end customers (market component of supply contracts and tariffs)	At the time of energy delivery	Certificates for delivery year Y	Calculated from auctions prices	~ 48GW (o/w ~ 35GW valued)

(1) With an assumption of 2 years of auctions in a given year, and ARENH cropping at 30%

(2) DY = delivery year

# GREAT BRITAIN CAPACITY AUCTION RESULTS FOR EDF ENERGY

All capacity agreements for 1 year unless otherwise stated	Clearing price £/kW/an	Nuclear	Coal	Demand-side Response (DSR)
2016 Q4 (2020/2021)	22.5 (2015/2016 prices)	All 16 units (7.9GW)	3 of 8 units (1.8GW)	N/A
2018 Q4 (2021/2022)	8.4 (2016/2017 prices)	All 16 units (7.9GW)	0 unit	5 units (32.1MW)
2020 Q3 (2022/2023)	6.4 (no indexation)	12 units (5.9GW)	0 unit	0 unit
2021 Q1 (2023/2024)	16.0 (2018/2019 prices)	8 units (4.0GW)	0 unit	4 units (21.5MW)
2021 Q1 (2024/2025)	18.0 (2019/2020 prices)	4 units (2.0GW)	0 unit	0 unit

*The slide includes capacities for which agreements were awarded (de-rated capacity).  
For DSR this equates to bidding capacities in the context of auctions*

# CAPACITY MECHANISM IN ITALY

A capacity mechanism was set up in 2019 using rules approved in a decree of 28 June 2019 issued by the Economic Development Ministry

Edison awarded 2.8 GW of existing capacity in 2022 and 2023 auctions, and a total of 1.4 GW of new capacity for a fixed annual premium of €75,000/MW for new capacities and €33,000/MW for existing capacities

The auction for delivery year 2024 have taken place on February 21, 2022, Edison awarded 2.275 MW existing capacity at 33.000 €/MW and 7 MW new capacity not authorized at 33.467 €/MW.

Generation capacity eligible for capacity mechanism has to respect specific requirements in terms of fossil-fuel carbon emissions per kWh of electricity.

## FUNCTIONING

This mechanism is based on an auction process organised by TERNA, the Italian transmission grid operator, for each delivery year. Operators of existing and new production or storage units can participate in the auctions

## FIXED PREMIUM

The operators of the selected capacities are paid through a fixed premium, for one year in case of existing units and 15 years for new units. The fixed premium is paid during the delivery year

## INCENTIVE FOR CAPACITY AVAILABILITY

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 give back the surplus to TERNA

(1) Fixed premium

# EDF GROUP MAIN BUSINESSES



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# A RECOGNISED, INNOVATIVE AND DIGITAL CUSTOMER RELATIONSHIP

28 million of EDF customer accounts <sup>(1)</sup>  
including more than 2.1 million in gas

In the electricity market, 243.8TWh  
sold <sup>(1)</sup> in 2021

In the gas market, more than 37.9TWh  
sold <sup>(1)</sup> in 2021

## High customer satisfaction in France



Satisfied  
customers

BUSINESSES AND  
PROFESSIONALS

LOCAL  
AUTHORITIES

RESIDENTIAL  
CUSTOMERS

9 out of 10 customers

## Did you know ?

All **EDF Customer Relationship Centers** are located in France. They help to maintain employment areas throughout the territory. **In 2021, EDF became the first company to obtain the “Relation Client France” certification** implemented by *Association Française de la Relation Client* (AFRC) and *Association Pro France*. This certification is granted to companies having chosen to localise all their customer service in France and having committed to initiatives in local integration, training and inclusion in French territories

EDF continues its certification approach it began over ten years ago. This approach is an essential component of its strategy as a responsible employer. In 2019, EDF opted for **Afnor’s “Engagé RSE”** (CSR committed) certification based on highly demanding guidelines derived from the ISO 26000 standard. The assessors awarded EDF’s customer relations centres with a “Confirmed” level in terms of CSR. The certification highlights the quality of the company’s social practices in terms of customer relations, notably through the training of customer advisors and the attention paid to their working conditions

## Close customer relations based on personalised, human and digital services



- **6,200 customer advisers** serving residential & business customers
- **230 solidarity experts**
- Sales teams in **8 Regional Directorates** serving Businesses and Local Authorities
- ➔ **All teams based in France, close to customers**

A continuous evolution of our offers and services: to  
innovate both for and with our customers



# EDF CUSTOMER SOLUTIONS IN FRANCE: RESIDENTIAL CUSTOMERS



5,000  
customers advisors,  
all located in France



74.3 million  
visits to digital platforms  
to monitor consumption



million of  
visits to websites  
and the EDF & Me  
app

**EDF pulse & you**  
France's first co-innovation site\*  
Launch of a Participatory Investment  
portal in 2021  
\* Faber Novel Study 2019

EDF innovates in order to be the **supplier for the well-being** of its customers  
with a high quality services and **reference offers**

## ENERGY OFFERS TAILORED TO CUSTOMER EXPECTATIONS

The regulated sales tariff and new market offerings:

- **“Mes jours Zen”**, the first electricity offer that adapts to the needs of consumers (choice a day in addition to the weekend when the price is lower)
- The **“Gamme Vert Electrique”** with:
  - **Vert Électrique**
  - **Vert Électrique Week-end** (for customers equipped with Linky...)
  - **Vert Électrique Auto** (... and with an electric vehicle)
  - **Vert Électrique Régional** (backed by green output in a French region)
- An online offer with attractive prices: **Digiwatt**
- The **“Gamme Avantage Gaz” (4-year fixed price)**:
  - **Avantage Gaz**
  - **Avantage Gaz Durable**, incorporating carbon offsetting
  - **Avantage Gaz Connecté**, integrating the management of the individual boiler
- **Avantage Gaz Optimisé**, at an advantageous price that is always below the gas regulated tariff

## SERVICES AND GOOD DEALS FOR OUR CUSTOMERS

- **Check**, a moving assistant on smartphones with advantageous deals negotiated with partners
- **An offer of troubleshooting assistance.** Three options of troubleshooting assistance, for a rapid intervention
- **Assurénergie+** pour aider les clients à payer leurs factures en cas de coup dur avec en plus des services d'accompagnement pour faciliter le quotidien
- The **IZI by EDF** local services platform for home improvements, particularly in terms of energy renovation and electric mobility
- The website **Prime-energie-edf.fr** to receive financial assistance for renovation work
- The network of **Energy Saving Partners** qualified RGE (Recognized Environmental Guarantor).
- The **“Mon chauffage durable”** offer for the replacement of oil, gas or coal boilers by a heat pump, in order to reduce energy bills and CO<sub>2</sub> emissions.

## OMNI-CHANNEL SUPPORT FOR ENERGY SAVINGS

- The digital solution **Mes écots et moi** enables all customers to better understand and control their consumption (monitoring their actual daily or 30-minute consumption in euros and kWh)



- The **Fil d'Actu** solution, on the EDF & Moi application, also provides access to information to understand your consumption and make energy savings.

# EDF CUSTOMER SOLUTIONS IN FRANCE: BUSINESS MARKET (COMPANIES, PROFESSIONALS AND LOCAL AUTHORITIES)

EDF is positioned as local *business partner* to assist its customers in the energy transition and their competitive challenges

## ENERGY OFFERS FOR ALL CONSUMPTION PROFILES

- **Electricity and gas supply offers tailored to every customer segment:**
  - Electricity and gas offers at guaranteed prices; electricity offers at differentiated prices by time slot and by season – Flexible, Matina or Estivia; packaged offers for more simplicity with the Performance pack (Guaranteed Contract and Consuming Monitoring)
  - Customisable offers are proposed to multi-sites and large tertiary and industrial customers
- **The opportunity to choose a Renewable Energy option**, whatever the chosen electricity supply offering, and solutions for the supply of sustainable gas

## AN EXTENDED RANGE OF SERVICES

- **Services to simplify the everyday lives of small- and mid-size business customers:** breakdown assistance services in electricity, gas and plumbing, and electronic and grouped invoicing;
- **Local services tailored to the needs of professional customers:** the “*Bénéfices Pro*” offering when moving into their premises and the completion of works with IZI-by-EDF
- **Digital solutions and expertise to support industrial and tertiary customers in the management of energies and fluids:** monitoring and analysis of consumption, consumption expertise, and Intelligent Building Steering
- **Support services for achieving carbon neutrality in energy consumption and output:** offerings related to self-consumption of photovoltaic generation, the supply of renewable-origin energy, electric mobility and advice on how to decarbonise business activities.

## CUSTOMER ADVISORS LOCATED IN FRANCE & A PERSONALISED RELATIONSHIP

- **A personalised, human and digital customer relationship:** advisors in France, information at every stage of the customer journey, dedicated websites and customer area
- **SMS interactions and Web Call Back**
- **Specific tools for large customers:** Business Board to track sourcing optimisation and send purchase orders with one click

## Key figures



**3 million**

of visitors on websites and client areas (per year)



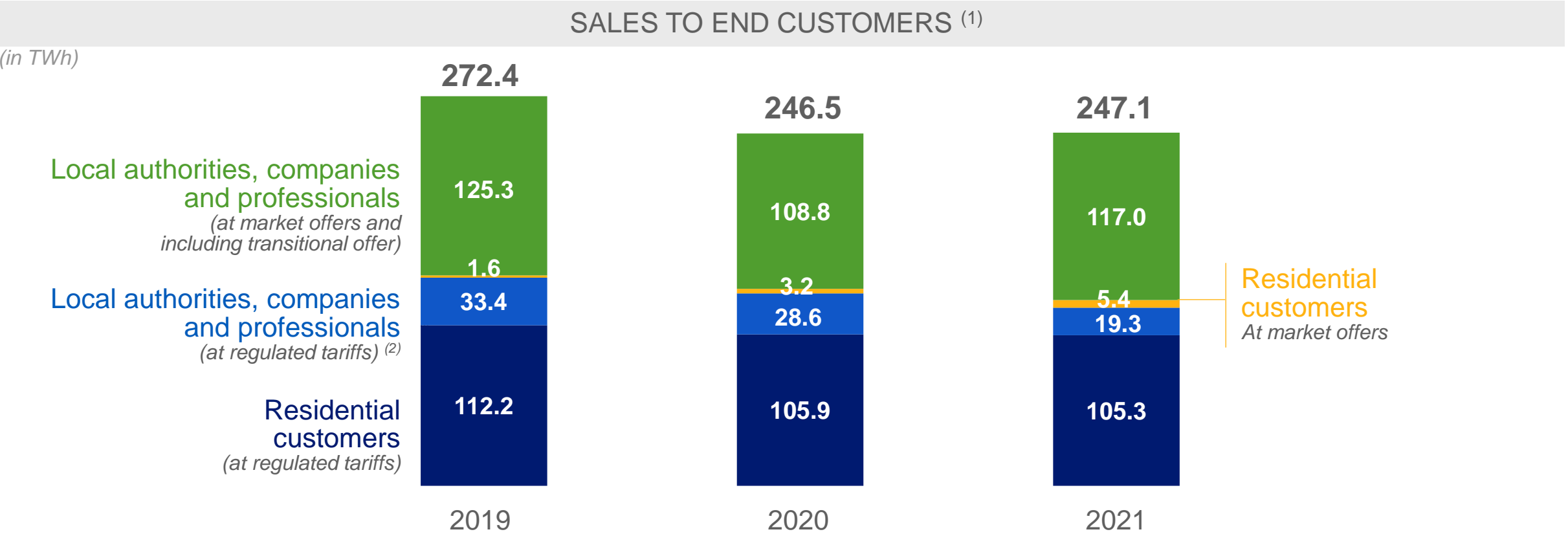
**240,000**

monthly connexions to customer pages

## Specific support for local authorities and social housing lessors

**EDF has developed tailored solutions adapted to the needs of local authorities and social landlords:** energy services to combat energy vulnerability. Special systems to improve the energy efficiency of social housing: the “amount of charges” offering to promote energy savings certificates (CEEs). Ergo-therapy assessments for senior dwellings.

# ELECTRICITY SUPPLY IN FRANCE



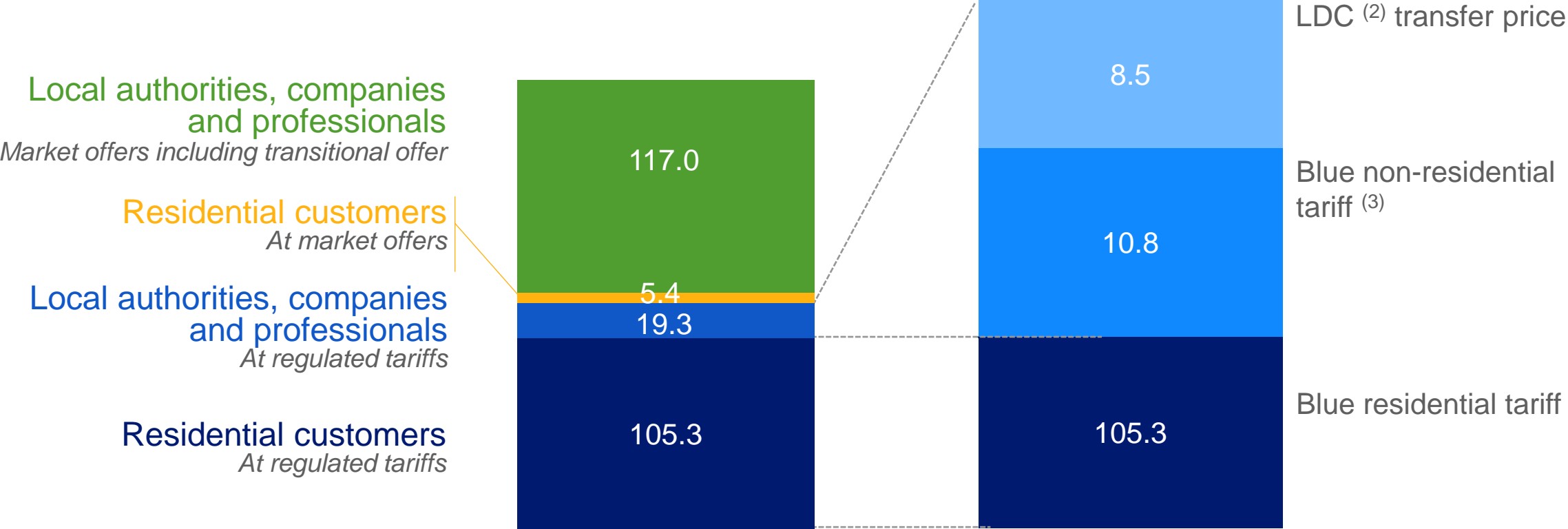
(1) Rounded to the nearest tenth. Including EDF's own consumption

(2) Blue professional tariff, LDC (Local Distribution Companies) at transfer price and Yellow and Green tariffs, below 36kVA that persist beyond 2015

# ELECTRICITY SUPPLY IN FRANCE – SALES UNDER REGULATED TARIFFS SPLIT

SALES TO END CUSTOMERS FOR 2021 <sup>(1)</sup>

(in TWh)



(1) Rounded to the nearest tenth. Including EDF's own consumption  
(2) Local Distribution Companies (LDCs)  
(3) Of which Yellow and Green tariffs for 0.06TWh - Tariffs lower than 36 kVA

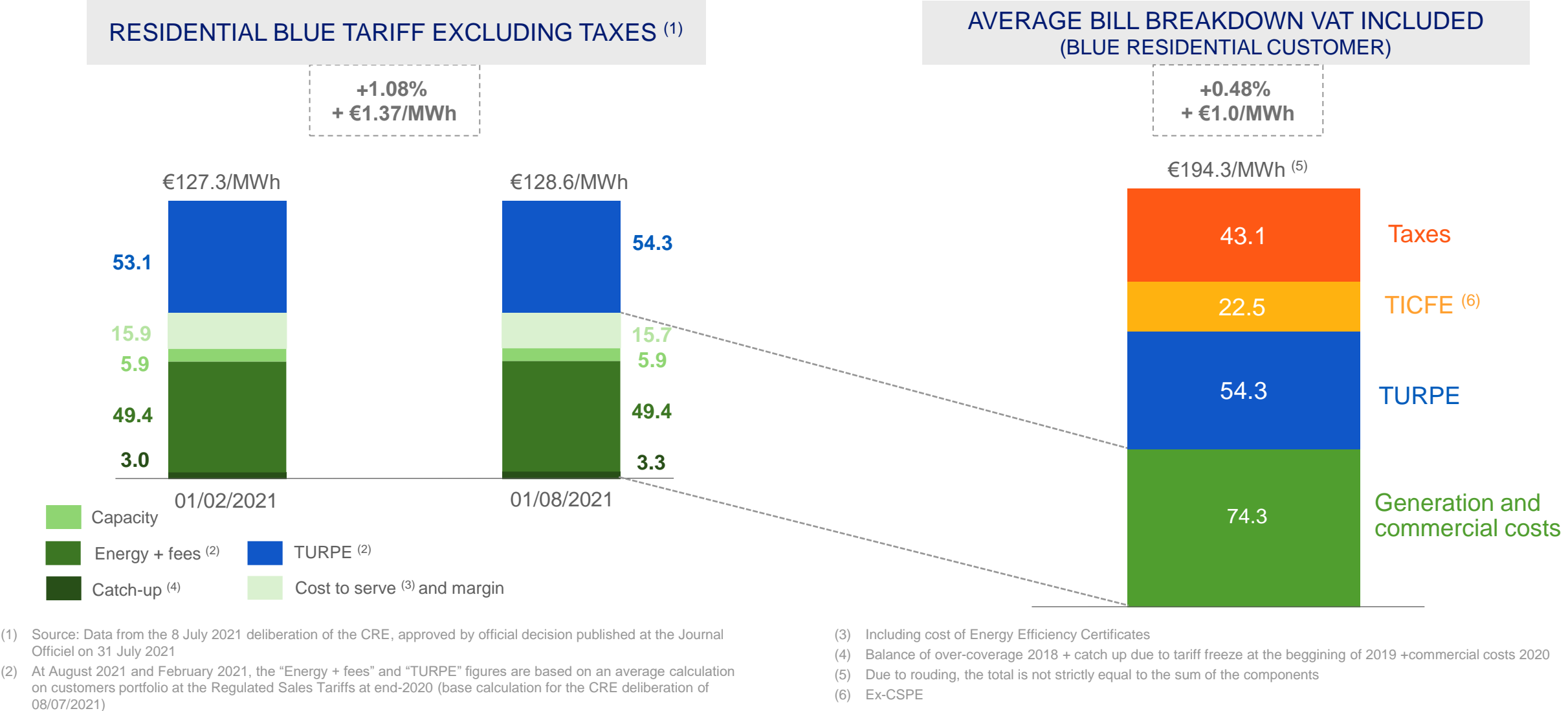
# REGULATED SALES TARIFFS IN FRANCE (1/3)

Change in Blue tariff				
Date	Change in Residential Blue tariff		Change in Non-Residential Blue tariff	
	(VAT excluded)	(including VAT)	(VAT excluded)	(including VAT)
01/02/2018	+0.7%	+ 0.6%	+1.6%	+ 1.3%
01/08/2018	-0.5%	- 0.3%	+1.1%	+ 0.9%
01/06/2019	+7.7%	+ 5.9%	+7.7%	+ 5.9%
01/08/2019	+1.49%	+ 1.26%	+1.34%	+1.1%
01/02/2020	+3.0 %	+2.4%	+3.1%	+2.4%
01/08/2020	+1.82%	+1.54%	+1.81%	+ 1.58%
01/02/2021	+1.93%	+1.61%	+3.23%	+2.61%
01/08/2021	+1.08%	+0.48%	+0.84%	+0.38%
01/02/2022 <sup>(1)</sup>	+24.3%	+4.0%	+23.6%	+4.0%

(1) Values calculated based on the grids of the decrees of 28 January 2022 published in the Official Journal of 30 January 2022 for application on 1 February 2022.



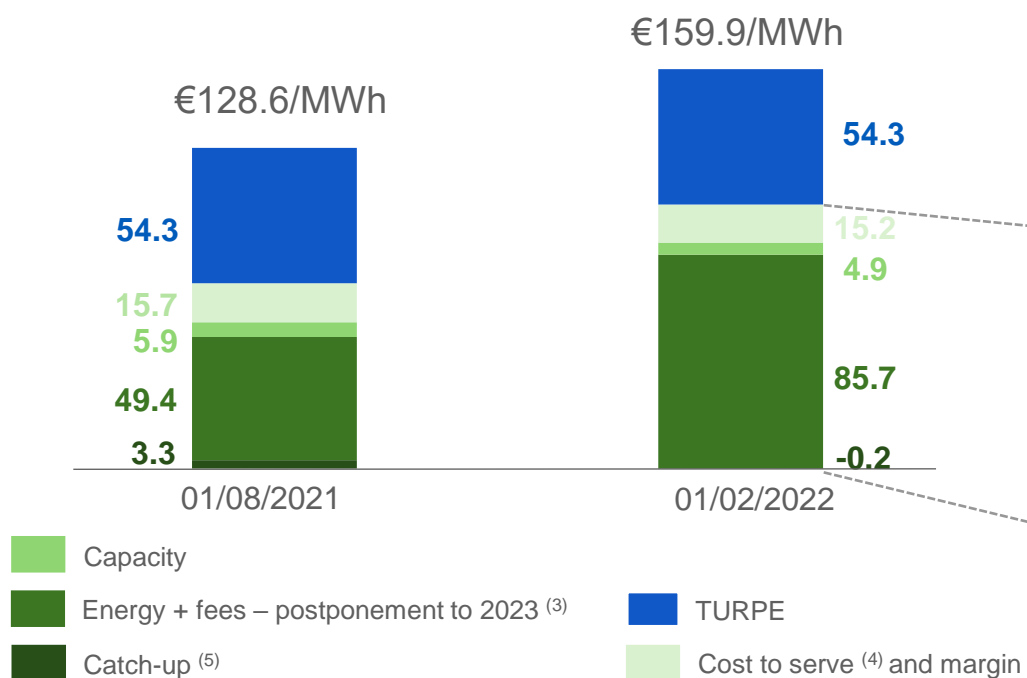
# REGULATED SALES TARIFFS IN FRANCE : CHANGE IN AUGUST 2021 (2/3)



# REGULATED SALES TARIFFS IN FRANCE : CHANGE IN FEBRUARY 2022 (3/3)

## RESIDENTIAL BLUE TARIFF EXCLUDING TAXES <sup>(1) (2)</sup>

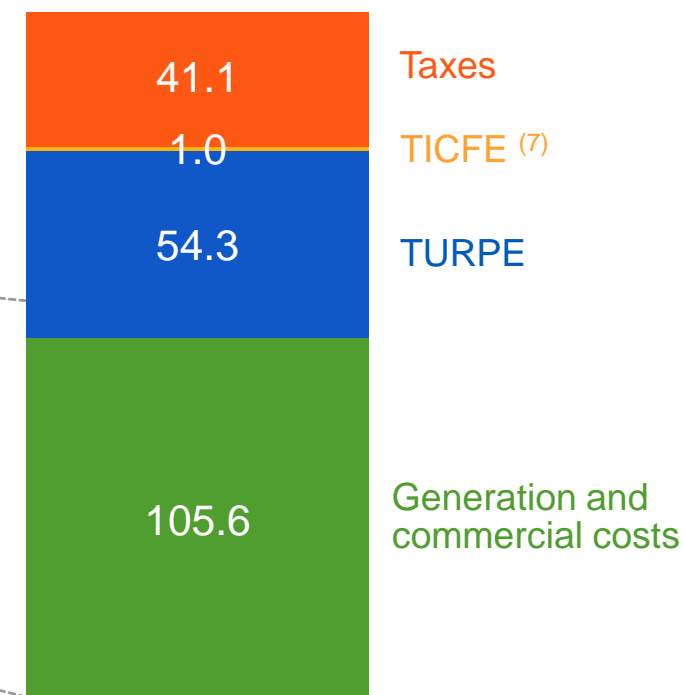
+24.3%  
+€31.3/MWh



## AVERAGE BILL BREAKDOWN VAT INCLUDED (BLUE RESIDENTIAL CUSTOMER)

+4.0%  
+€7.7/MWh

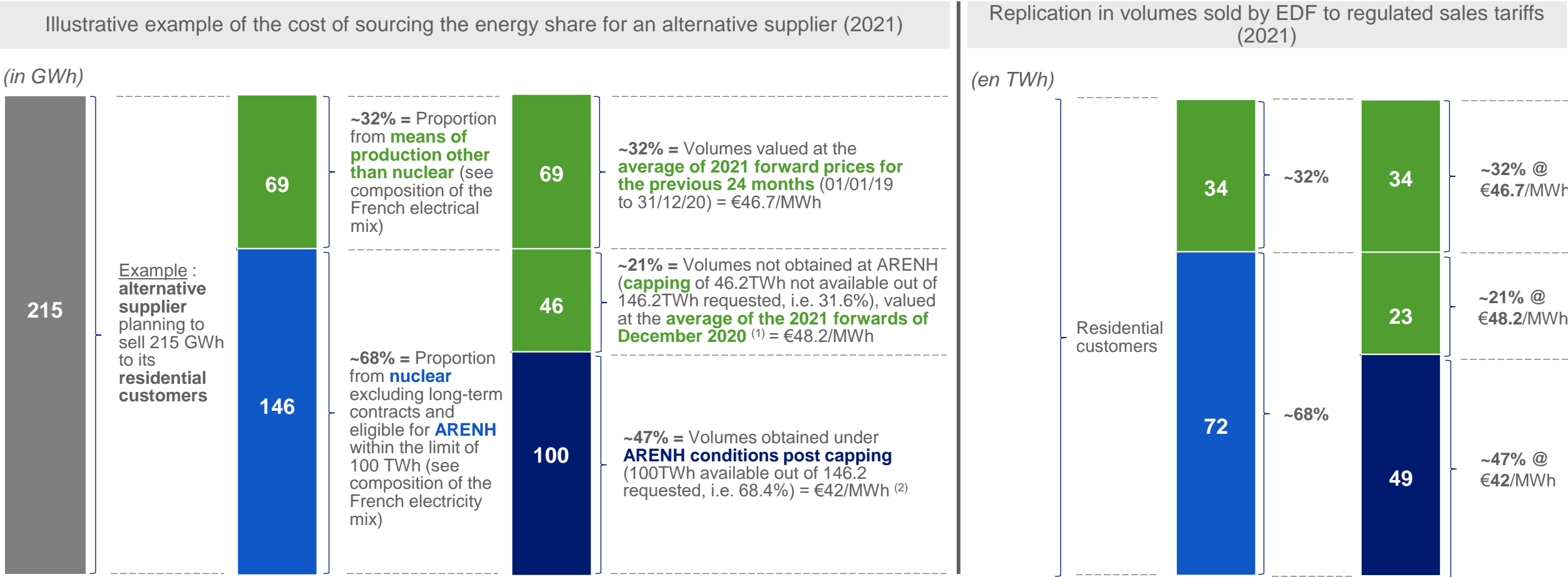
€202.0/MWh <sup>(6)</sup>



- (1) Source: for February 2022, date from the decree of 28 January 2022 published at the Journal Officiel on 30 January 2022
- (2) At August 2021 and February 2022, the figures are based on an average calculation on customers portfolio at the Regulated Sales Tariffs at end-2020 (base calculation for the CRE deliberation of 18/01/2022)
- (3) As part of the tariff shield, part of the 2022 increase is postponed to 2023 to limit the average increase in the 2022

- residential blue tariff to 4% including tax
- (4) Including cost of Energy Efficiency Certificates
- (5) Commercial costs of 2021 + catch-up of January 2021 (catch-up of the tariff freeze of 2019 is ended)
- (6) Due to rounding, the total is not strictly equal to the sum of the components
- (7) Ex CSPE

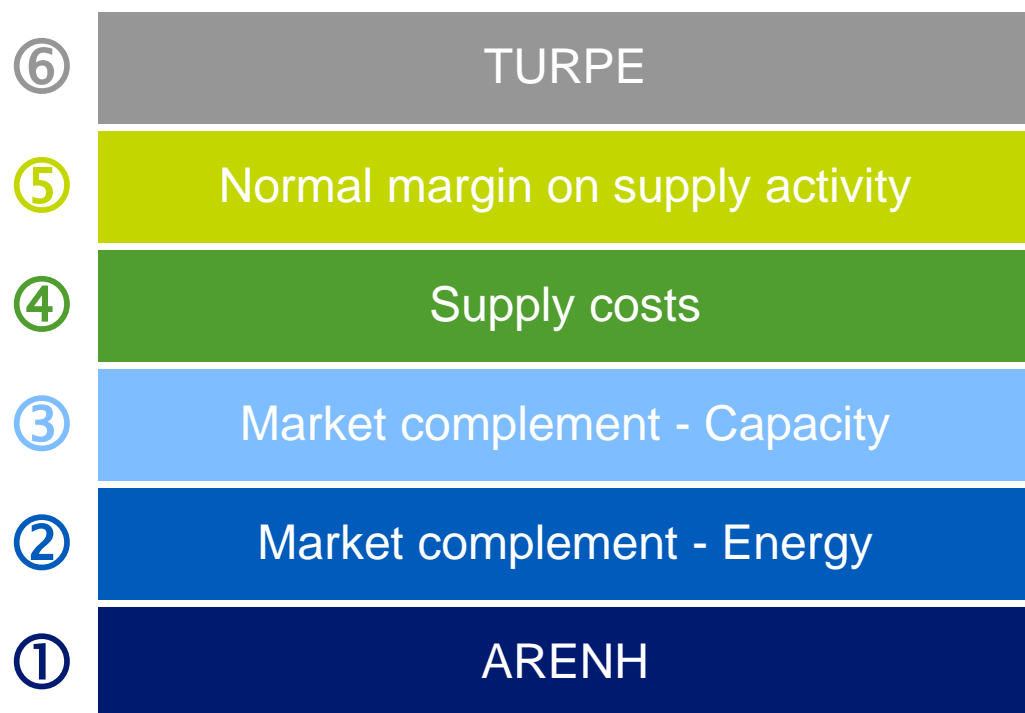
# ILLUSTRATION OF THE ENERGY PART CALCULATION IN THE REGULATED TARIFFS



NB: Volumes sold at market offer follow the same kind of pattern. The share of electricity coming from nuclear is more important as industrial customers have a more baseload consumption profile. Also, the valuation of the volumes can be different as some customers may have long term supply contracts at fixed prices.

(1) Consideration of future market prices from 02/12/20 to 24/12/20, post announcement of the results of the November ARENH window (146.2 TWh requested for 100 TWh available, leading to sourcing on the market of 46.2 TWh "clipped").  
(2) Post results of the November 2020 ARENH counter (100 TWh delivered at the ARENH price for a demand of 146.2 TWh).

# FRANCE: COMPONENTS OF THE COST STACKING METHOD FOR THE BLUE TARIFF



- ⑥ Delivery cost, which reflects the cost of using the electricity transmission and distribution systems
- ⑤ Margin earned on electricity supply activity:
  - Return on capital employed in marketing activity
  - WCR coverage
- ④ Commercial costs of a supplier at least as efficient as EDF in the business of supplying electricity to those customers having subscribed contracts under regulated tariffs (including cost of energy savings certificate system)
- ③ Cost of the capacity guarantee from the mechanism requiring suppliers to have capacity guarantees as from 2017 covering their customers' peak consumption
- ② Cost calculated according to average consumption characteristics and observed forward market prices
- ① Cost of regulated access to historical nuclear electricity taking into account the ARENH ceiling

(1) Source: Decree no. 2014-1250 of 28 October 2014 modifying the decree no. 2009-975 of 12 August 2009 on regulated tariffs

# ENERGY SAVING CERTIFICATES SYSTEM

<p>Implemented in 2006 Confirmed in 2021</p>	<p>The French response to requirements of the European Directive 2012/27/EU on energy efficiency. The fifth EEC period began on 1 January 2022 for a four-year period.</p>
<p>Enhanced targets, a greatly increased scheme cost</p> <p>Publication 5th period obligation</p>	<p>The national obligation for the fifth period was set at 2,500TWhc by the decree of 3 June 2021 (up 17.2% compared with the fourth period).</p> <ul style="list-style-type: none"> <li>➤ Of which 730TWhp for households in energy poverty (+37 with, in parallel, the shift of vulnerability towards households with extremely low incomes) and 1,770TWhp of conventional energy savings certificates (CEE) obligation (+10.7%)</li> <li>➤ The measure costs over €5bn a year</li> <li>➤ Rebalance of the obligation between energies, historically unfavourable to electricity (Elec +4% / Gas +58% / Fuels 18% compared with the 4th period)</li> <li>➤ Phased lowering of the franchise threshold (400 GWh/year → 100GWh/year from 2024) to limit distortions to competition</li> <li>➤ Limitation of “Coups de Pouce” schemes and more generally bonuses (25% of the obligation)</li> <li>➤ Implementation of inspections of energy savings work operations at beneficiaries, carried out by accredited inspection offices before the obliged party is able to make its EEC request to the public authorities.</li> <li>➤ The Fit for 55 package and the EU’s EED Directive (target on energy savings increased from today’s 0.8% to 1.5% in 2024) could lead to an increase in the EEC obligation in 2024. This potential increase would result from the EEC 2024-2033 obligation trajectory to be decided on as part of the energy and climate planning act to be adopted before 1 July 2023.</li> </ul>
<p>Involved parties</p>	<p>An obligation imposed on energy suppliers to achieve energy savings for customers called “obligated parties”.</p> <ul style="list-style-type: none"> <li>➤ Electricity, gas, heating, refrigeration, domestic fuel and automotive fuel</li> </ul> <p>In order to promote the issuance of energy efficiency operations to their customers</p> <ul style="list-style-type: none"> <li>➤ Households, local authorities, social housing landlords or business/professionals</li> </ul>
<p>EDF and the mechanism</p>	<p>EDF is the first obligated party and intervenes in several areas:</p> <ul style="list-style-type: none"> <li>➤ Residential (insulation work and the replacement of heating equipment thanks to the subsidies provided by the “Coups de Pouce” schemes via the “Mon chauffage durable” offer), social-housing lessors and industry and services</li> <li>➤ Financing of national programmes : ADVENIR (electric vehicle recharging stations), FEEBat (training craftsmen), SARE (<i>Service d’Accompagnement pour la Rénovation Énergétique</i>) with the ADEME, ACTEE with the FNCCR, etc.</li> </ul>

# CUSTOMER SOLUTIONS IN THE UK: EDF ENERGY

## RESIDENTIAL CUSTOMERS

- **Highly competitive market with ~33 suppliers<sup>(1)</sup>**. EDF Energy market share at 8% at end-January 2022
- During 2021, **EDF Energy** supplied 12.5TWh of electricity and 35.2TWh of gas for the domestic segment.
- 3.3 million electricity accounts and 2.3 million gas accounts on this segment at 31 December 2021
- Despite the industry wide challenges such as the current energy crisis, EDF has maintained a Trust pilot score of 'Great' and is rated 3rd out of 22 energy suppliers by Citizens Advice based on July-September 2021 data, and 2nd of the large suppliers, as defined by Ofgem.

## BUSINESS CUSTOMERS

- In 2021, the non-domestic segment supplied a total of 30.8TWh of electricity, 1.9TWh to 221k small business customers ("SME") and 28.9TWh to 9.2k medium and 5k large business customers ("I&C") accounts.
- In Large Business Sales, a targeted new-business approach has led to the successful acquisitions of 12 new customers in 2021 (double previous years).
- In the Export market, EDF has grown its Power Purchase Agreement business and has become the largest renewable power offtaker (based on owned and 3rd party capacity) according to the latest industry market report. EDF has also successfully bid to become the offtaker of the Sofia Wind Farm generation, 6.5TWh of annual volume is expected to become fully operational in 2026.

(1) Cornwall Insight data at 31/10/2021

## INNOVATION



**EDF Energy: fairness and convenience for customers; efficient operations; innovation (digital technology & smart metering)**

- **EDF Energy has brought innovative concepts to market** through a rapid development approach. A high focus is on the Internet of Things (IoT) with multiple applications being developed.
- Powervault – a smart way to store free solar or cheap energy from the grid to reduce energy bills.
- PowerShift 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.
- EDF Energy's acquisition of PodPoint (Electric Vehicles (EV) charge point operator) in the UK has created significant value with 8,565 EV related sales in 2021. PodPoint was floated on the London Stock Exchange (4/11/2021) raising £105m to fund future growth in the EV market.
- 452k smart-meters installed by EDF Energy for its customers in 2021.



# CUSTOMER SOLUTIONS IN ITALY: EDISON

- Edison, through its 100% controlled company **Edison Energia** is involved in the electricity, gas and value-added services supply to Italian customers
- The acquisition of the Italian activities of Gas Natural/Naturgy and Attiva in 2018, and their integration into Edison Energia, allowed to increase Edison's customer base and to enlarge the company's presence in Central and Southern Italy. The acquisition of Energia Etica in 2021 strengthens Edison's position in the retail market. In addition, at the end of 2021, Edison acquired Medicoora.

## Business market (B2B)

- Edison is a **leader in the B2B market** both in power and gas
- Second operator in terms of volumes to final customers, after the incumbents Enel (gas) and Eni (power)
- Synergies for the development of the biomethane and bioLNG business segment to make the transport sector more sustainable

## Retail market (B2C)

- **Late 2008: Edison entered the retail free market** in power and gas, positioning itself as the new real alternative to incumbents (Enel, Eni, ex-Municipalities)
- **July 2019:** Completion of the acquisition of **Assistenza Casa**, company active in maintenance and domestic fault repair services, also allowed the development of further value-added services and an expansion of the offer

POWER SALES IN 2021	GAS SALES IN 2021
10.8TWh	7.1bcm <sup>(1)</sup> o/w 1.3bcm resellers 5.8bcm business
2.5TWh	674Mm <sup>3</sup> <sup>(2)</sup>
0.7m contracts <sup>(3)</sup>	0.9m contracts <sup>(3)</sup>

## New innovative offers and services

- **Edison Casa Relax:** 24/365 assistance for electricity system, unlimited interventions, monthly fee.
- **Prontissimo Casa:** Telephone Assistance (24h x 7 days a week) and a network of 2,000 artisans ready to intervene for every need (gas, plumber, locksmith...)
- **Edison My Comfort:** Sale, Installation, Maintenance, Insurance of cooling and heating systems.
- **Superbonus 110%:** Wide range of products for energy efficiency interventions, providing customers with tools to obtain tax deductions
- **My Sun:** a new innovative service that combines a photovoltaic system, a storage and a commodity offer
- **Edison Plug & Go:** electric cars long rental (2-5 years) , installation of a charging wall box and app (for public recharges).
- **Edison Sweet:** new innovative offer with a customer loyalty mechanism (bonus and incentives) in order to reduce the churn rate
- **Edison Resolve:** new offer a wide-ranging offer of domestic services: house cleaning, laundry, appliance repair, plant interventions, renovations and virtual closet and box

# CUSTOMER SOLUTIONS IN BELGIUM: LUMINUS

- **The second largest player in the Belgian energy market, Luminus** supplies electricity and gas to more than **2.1 million** residential and professional **customers** <sup>(1)</sup> and local authorities.
- In May 2021, Luminus **acquired the supplier Essent Be** with a portfolio of around 0.5 million customers, mainly B2C. Essent's portfolio forms a complementary fit in terms of sales channels and geographical breakdown. The acquisition strengthens Luminus's second-ranking position.

## ➤ **Energy services:**

- The company is involved 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.
- Sales of **boilers and PV installations** remain at a high level, with around 1,900 installations in 2021. The launch of new combined service/maintenance offers for boilers.
- At end-2021, the B2C portfolio for those services has more than 175,000 contracts
- For its **industrial customers**, Luminus together with ATS, Luminus Solutions, **offers 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, ... based on an energy performance contract.
- In 2021, further **LED renovation works on street lighting equipment** for the major roads in the Walloon region (with the consortium Luwa, including **Dalkia Electrotechnics / Citelum, Luminus,...**).

## Key figures

- **2,358MW** installed
- **7.0TWh** of electricity generation
- **2.1 million delivery points**
  - **~23%** market share
  - **~98 %** B2C

## Did you know?

- In 2021, Luminus continued to move ahead with its expansion strategy by extending its presence upstream in the value chain with the acquisition of a minority stake in a company that develops solutions for electric mobility and energy management for business and retail customers. Despite the crisis, ATS pursued its external growth strategy by acquiring a range of installers in northern France with a view to strengthening its industrial coverage.

# EDF GROUP MAIN BUSINESSES

- **NUCLEAR**
- **RENEWABLES**
- **THERMAL POWER**
- **REGULATED ACTIVITIES (NETWORKS)**
- **OPTIMISATION & TRADING**
- **CUSTOMER SOLUTIONS**
- **ENERGY SERVICES**
- **GAS**

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# ENERGY SERVICES FOR THE GROUP'S INDIVIDUAL & B2B CUSTOMERS

## INDIVIDUAL CUSTOMERS

High expectations from the Group's individual customers:

- understanding and controlling their consumption and bills,
- controlling their impact on the environment. .

**The range of service offers is growing, for more serenity and to support the challenges of today and tomorrow:**

**sowee** The **monitoring** of heating, air quality, the charging station of the electric vehicle, etc. by voice and by touch

**cham** **Installation, maintenance and repair** of heating and hot water equipment

**izi** **Services** for sustainable housing and electric mobility: energy renovation and comfort works, installation of charging stations and heating equipment (together with IZI Confort)

**izivia** **Electric mobility** at home and when traveling with the Izivia Pass

**EDF ENR** **Solar photovoltaic solutions** « Mon Soleil & moi » for self-consumption

## B2B CUSTOMERS

- The EDF Group, through its expertise, can assist companies, industries and territories throughout the entire energy chain and on projects as different as heat networks, intelligent lighting, low-carbon decentralised generation, energy management, sustainable mobility or eco-neighbourhoods

- **Smart building:** Energy efficiency, buildings, energy management, self-consumption, heat recovery, ...



- **Smart factory:** Data, artificial intelligence, predictive maintenance, energy efficiency, circular economy, economic performance, ...



- **Smartcity:** Local production, heat networks, renewable and recovery energy, thermal and electrical smart grids, collective self-consumption, urban services, ...

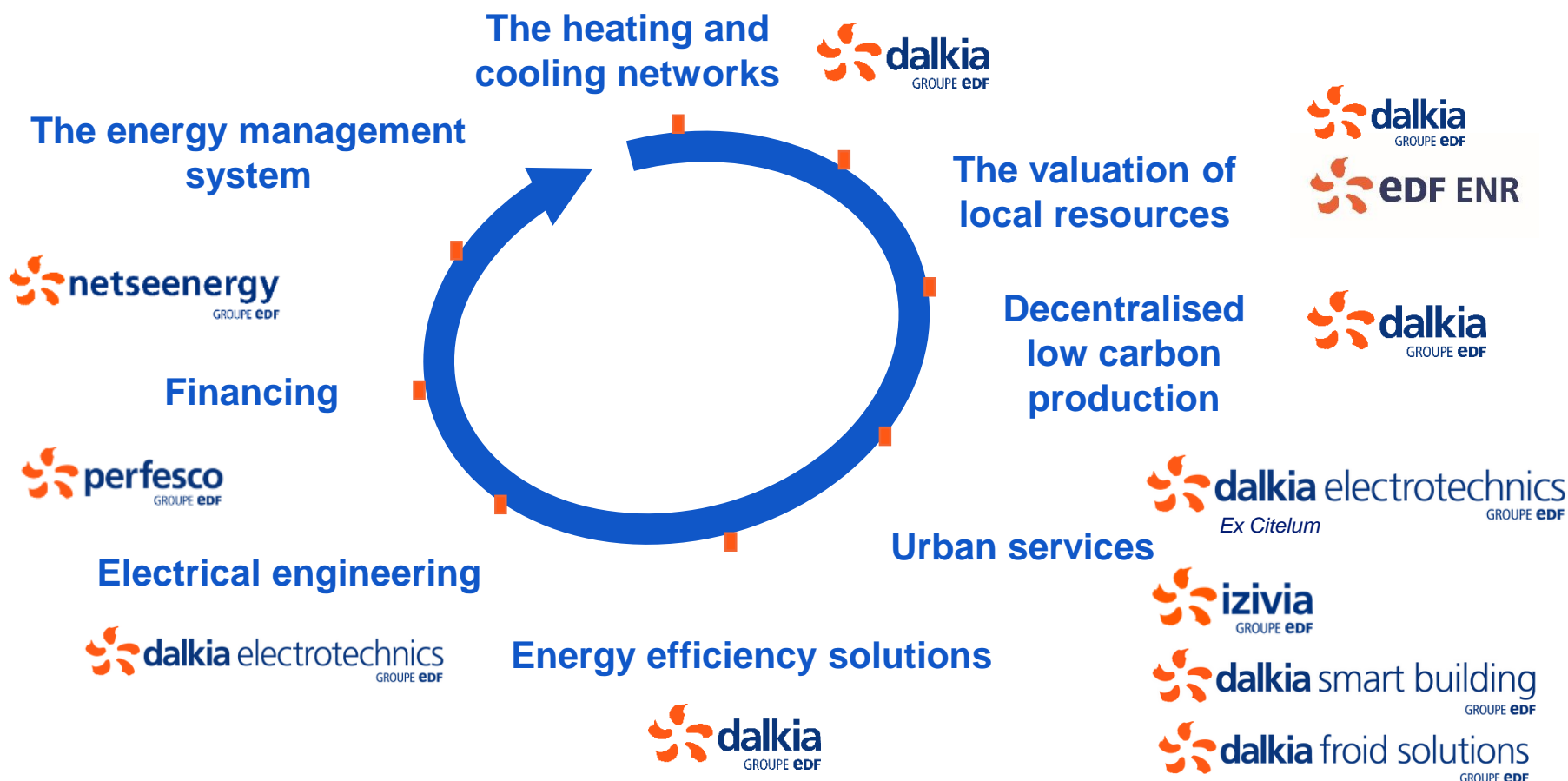


- Combining digital expertise, economic and low carbon performance, EDF and its subsidiaries invent innovative solutions tailored to each need

- **Assist companies throughout the entire energy chain**



# SERVICE SUBSIDIARIES: EXPERTISE ON THE ENTIRE B2B ENERGY CHAIN



**A creator of services and solutions to support customers and regions in the shift towards carbon neutrality**

**A benchmark in the low-carbon transition of society**, EDF creates value for its customers through the energy and **innovative solutions** it provides to them.

**CAP 2030 target:**

**> 15 Mt of CO<sub>2</sub> avoided\***

**Scope:**

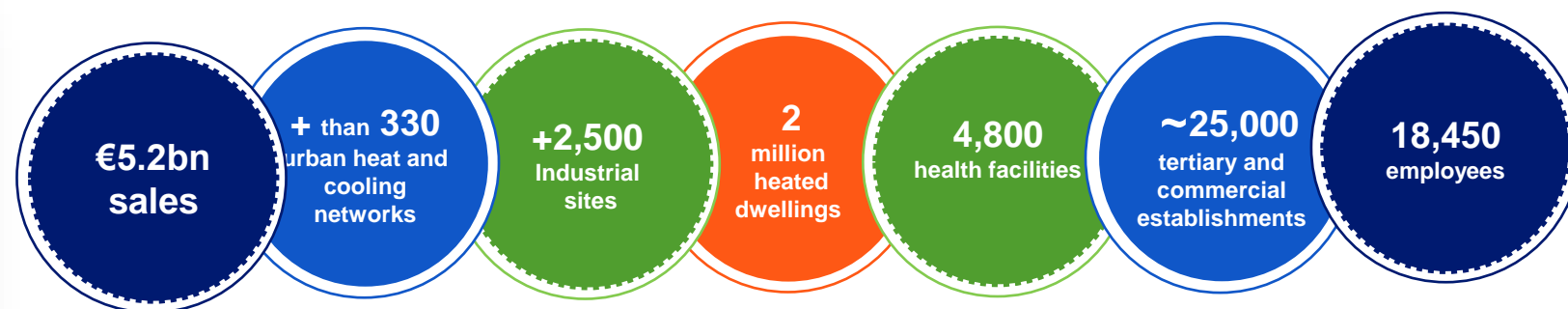
\* The business activities of the Customer Services and Territories division - EDF estimate, including CO<sub>2</sub> savings stemming mainly from heating and cooling networks, the development of electric vehicles and energy saving certificates.

# DALKIA: A MAJOR PLAYER IN THE ENERGY TRANSITION AT THE SERVICE OF ITS CUSTOMERS



EDF'S AMBITION IS TO DEVELOP SIGNIFICANT POSITIONS IN ENERGY SERVICES, THANKS TO THE KNOW-HOW AND EXPERTISE OF DALKIA AND ITS SUBSIDIARIES

- A leader in energy services in France, Dalkia has been helping regions accelerate their sustainable energy performance for 80 years. Dalkia is also developing internationally
- Two major business from decentralised generation to demand-side management:
  - Development and upgrading of renewable energies and recovery through heating and cooling networks (biomass, géothermy, thalassotherapy, waste heat recovery, etc.).
  - Energy savings through Energy Performance Contracts and management of the energy consumption of the installations by an interactive platform: DESC.
- Multiple skills at the very heart of the industry decarbonation and of the energy efficiency: climatic and electric engineering, cooling, compressed air,...



## ENVIRONMENTAL PERFORMANCE

Dalkia enables its customers to reduce their greenhouse gas emissions while developing renewable and recovery energies locally, et working on energy efficiency and the reduction of consumption



(1) Networks in France (SNCU scope)

(2) 3.7M tonnes excluding CO<sub>2</sub> thanks to CHP



# DALKIA: TAILOR-MADE SOLUTIONS

## SPECIALTY SUBSIDIARIES



Electrical engineering



Industrial and commercial refrigeration



Valorisation of biogas



Design and realization of energy efficiency solutions



Nitrogen compressed air and air production



Industrial and tertiary maintenance in nuclear sector

Other subsidiary



Building energy services

# DALKIA: INNOVATIVE PROJECTS

## SIGNATURE OF A PUBLIC-PRIVATE PARTNERSHIP WITH **SNCF GARES & CONNEXIONS** <sup>(1)</sup> TO DEVELOP A NEW SOLUTION FOR THE MANAGEMENT OF THE RAIL STATIONS

- **Objectives:** 12-year partnership to design, develop and roll out the "BIM OMM" tool, aiming at transforming and simplifying Operation & Maintenance of train stations. The platform will provide, in real time, digital twins of 122 rail stations, this making possible to rethink in a more sustainable, economical and ecological way the management of all buildings
- **BIM OMM technology:** process of updating and using data <sup>(2)</sup> from the digital model, through which all data on building's current state and new development are collected in real time. This is known as digital twinning. BIM OMM enable to plan, predict and optimise all type of technical work on rail stations

(1) For more information, see Dalkia's press release of 2 September 2021

(2) From the boiler model to the location of the windows and all the cables and pipes in the building

## PARTNERSHIP WITH **FUTUROSCOPE** <sup>(3)</sup> FOR THE CREATION OF A GREEN HEATING AND AIR CONDITIONING NETWORK

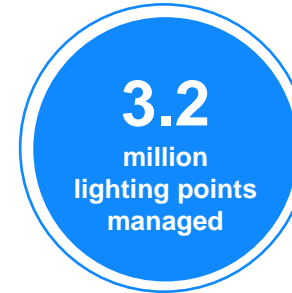
- **Objectives:** Environmental programme, digital management solutions and energy performance upgrades will allow to reduce Futuroscope's greenhouse gas emissions by 40% and to reduce its fossil fuel consumption by 30%
- **Technologies:** heat and cold will be produced by thermorefrigerating pumps (technology similar to heat pumps). It will use a local renewable energy collecting heat from an aquifer via a heat exchanger. Production plant will itself be powered by solar electricity from canopies with photovoltaic panels in the Futuroscope carpark

(3) For more information, see Dalkia's press release of 3 September 2021

# DALKIA ELECTROTECHNICS / CITELUM: SMART LIGHTING AND CONNECTED SERVICES



- **Smart and efficient lighting reference,** Dalkia Electrotechnics / Citelum has developed a whole range of connected services to meet the new challenges of its public and industrial customers: **energy saving, security, mobility, attractiveness, sustainable development, etc.**
- Projects and expertise across the value chain, **from design to operation**
- **An innovation pole based on:**
  - Reliable technological partners: manufacturers in lighting, security, mobility, IoT sectors..., start-ups
  - the collaborative platform for urban space management, MUSE®, developed by Dalkia Electrotechnics / Citelum subsidiary Citégestion, now available on the Microsoft Azure Cloud



## Dalkia Electrotechnics / Citelum Services

Ranges to suit all needs and customer profiles:

- **Smart lighting:** renovation, interior lighting, remote management, artistic lighting *etc.*
- **Security:** Video protection, traffic light and speed radars, warning systems, *etc.*
- **Mobility:** traffic light system, smart parking, electric vehicle charging solutions, *etc.*
- **Communication and information:** variable message signs, Wi-Fi, Li-Fi *etc.*
- **Quality of life:** air quality, noise sensors, *etc.*

## Smart and connected infrastructures

Dalkia Electrotechnics / Citelum builds, with and for its customers, **Smart City** projects that are tailored to their needs and focused on the quality of life of citizens.

In 2021, Dalkia Electrotechnics / Citelum and Eiffage, as a consortium, won **a City of Paris** contract for public lighting, traffic light systems and festive and architectural lighting

The contract provides for the replacement of 12,000 street lighting media and 21,000 signage media and signs, the replacement of 70,000 LED lighting sources, and the renovation of 870 kilometres of electricity grid.

In this respect, a combined total of 240GWh of energy savings will be made in ten years, for a 30% reduction in current street lighting consumption, from as early as the fifth year of the contract.

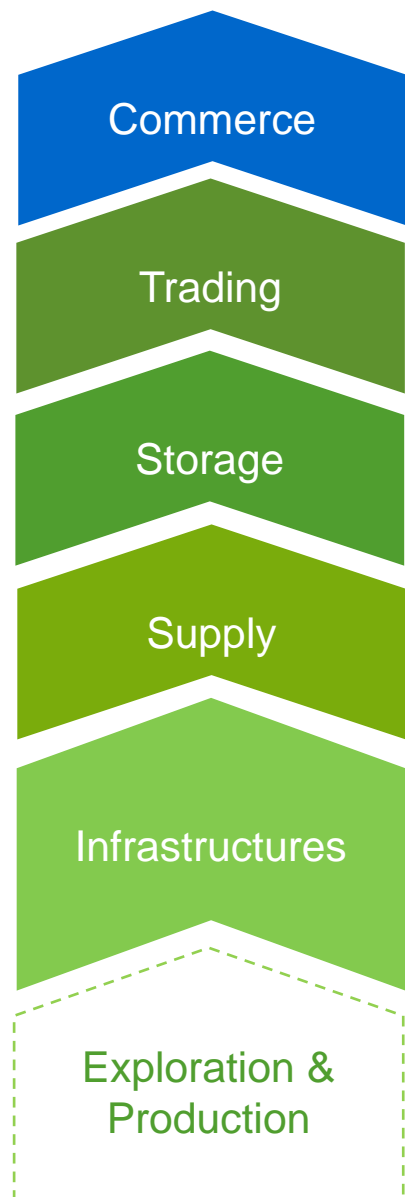
The implementation of the project will include a CSR component engaging the group to limit its own CO2 emissions and act in favour of employment by offering 600,000 hours of professional integration to people isolated from the job market.

# EDF GROUP MAIN BUSINESSES



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- **RENEWABLES** **P. 112**
- **THERMAL POWER** **P. 133**
- **REGULATED ACTIVITIES (NETWORKS)** **P. 136**
- **OPTIMISATION & TRADING** **P. 150**
- **CUSTOMER SOLUTIONS** **P. 166**
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# EDF IS WELL POSITIONED ON THE GAS VALUE CHAIN



- Dual-fuel offers (electricity and gas) and value added services to clients
- Supply of gas fired power plants
- Seeking arbitrages and optimising supply strategies
- Manage flexibility and regulated activity in Italy
- Examples: Cellino, Collalto and San Potito & Cotignola (Italy), Etzel storage (Germany)
- 6 gas import contracts
- 1 LT LNG contract (USA) from 2023
- Small scale LNG to reduce emissions in heavy and maritime transport
- LT LNG regassification capacity available in France, Italy and Belgium
- Development of import infrastructures
- New gas uses and green gas
- Norwegian E&P assets sold in March 2021.
- Divestment of Algeria planned at a later date

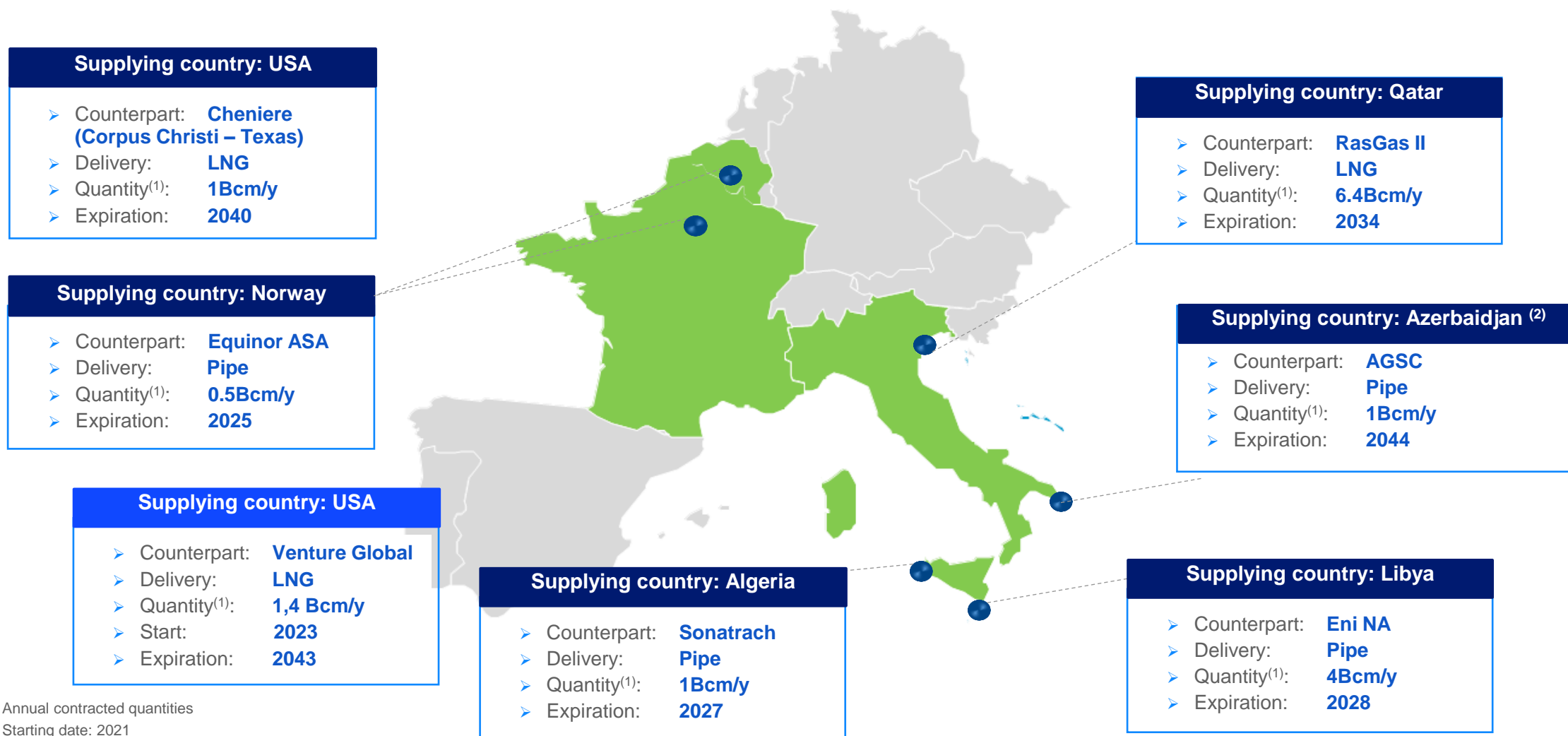


- Main gas downstream markets
- Storage centers
- Gas pipelines under development
- Gas pipelines under construction
- LNG storage inaugurated in October 2021
- LNG storage under development
- 1 LNG vessel under construction (174k cubic meters)
- 1 LNG vessel inaugurated in October 2021 (30k cubic meters)

# GAS SUPPLY SOURCES AS OF TODAY

## Gas supply long-term contracts

- The total volume of EDF's long-term gas contracts is 13.9bcm/year<sup>(1)</sup>, of which 12.4bcm imported by Edison



(1) Annual contracted quantities

(2) Starting date: 2021



# GAS END-MARKET

## DOWNSTREAM CUSTOMER PORTFOLIO IN EUROPE AS OF 31 DECEMBER 2021

	Number of Customers	TWh sold
FRANCE (EDF SA) <sup>(1)</sup>	~ 2.1 million	39.0
ITALY (EDISON)	~ 0.9 million	84.0
UK (EDF ENERGY) <sup>(2)</sup>	~ 2.3 million	36.0
BELGIUM (LUMINUS)	~ 0.8 million	13.0

- EDF is present on the European gas market for over 10 years, with ~6m clients and ~172TWh sold
- Dual fuel offer with value added services

(1) Excluding Corsica and the French overseas department

(2) Excluding Northern Ireland



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**APPENDICES**

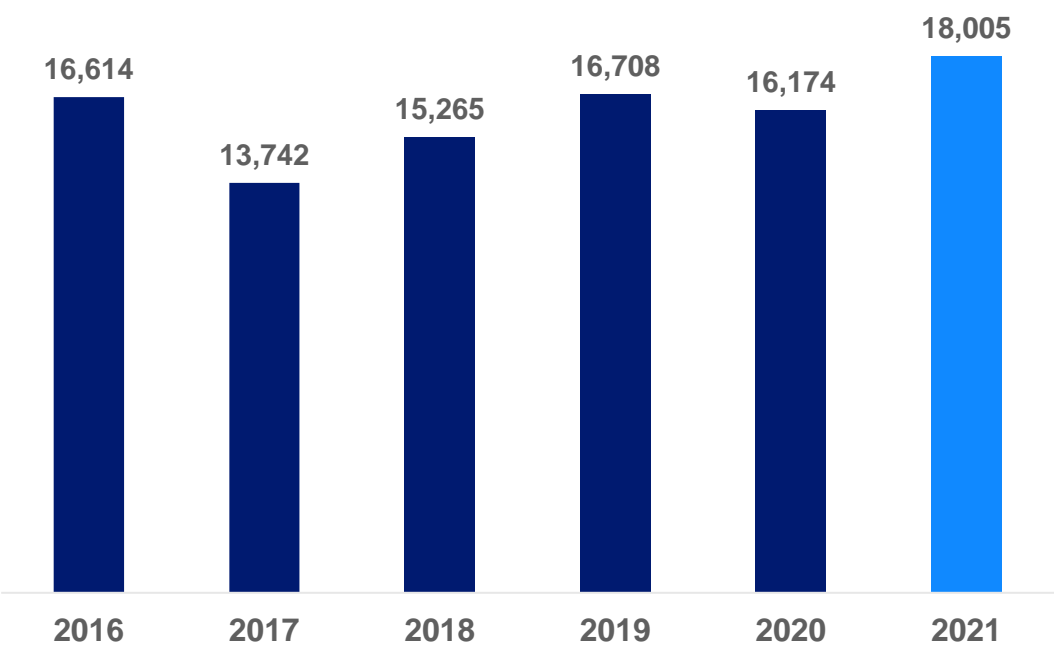
Sustainable finance is core to the Group's financing strategy. EDF is a leading issuer in the Green Bonds and now social bond market with the equivalent of €10 billion issued since 2013. The Group is investing massively in the energy transition through investments in decarbonised production methods (nuclear and renewable), networks, the development of energy services, the deployment of smart meters, etc.

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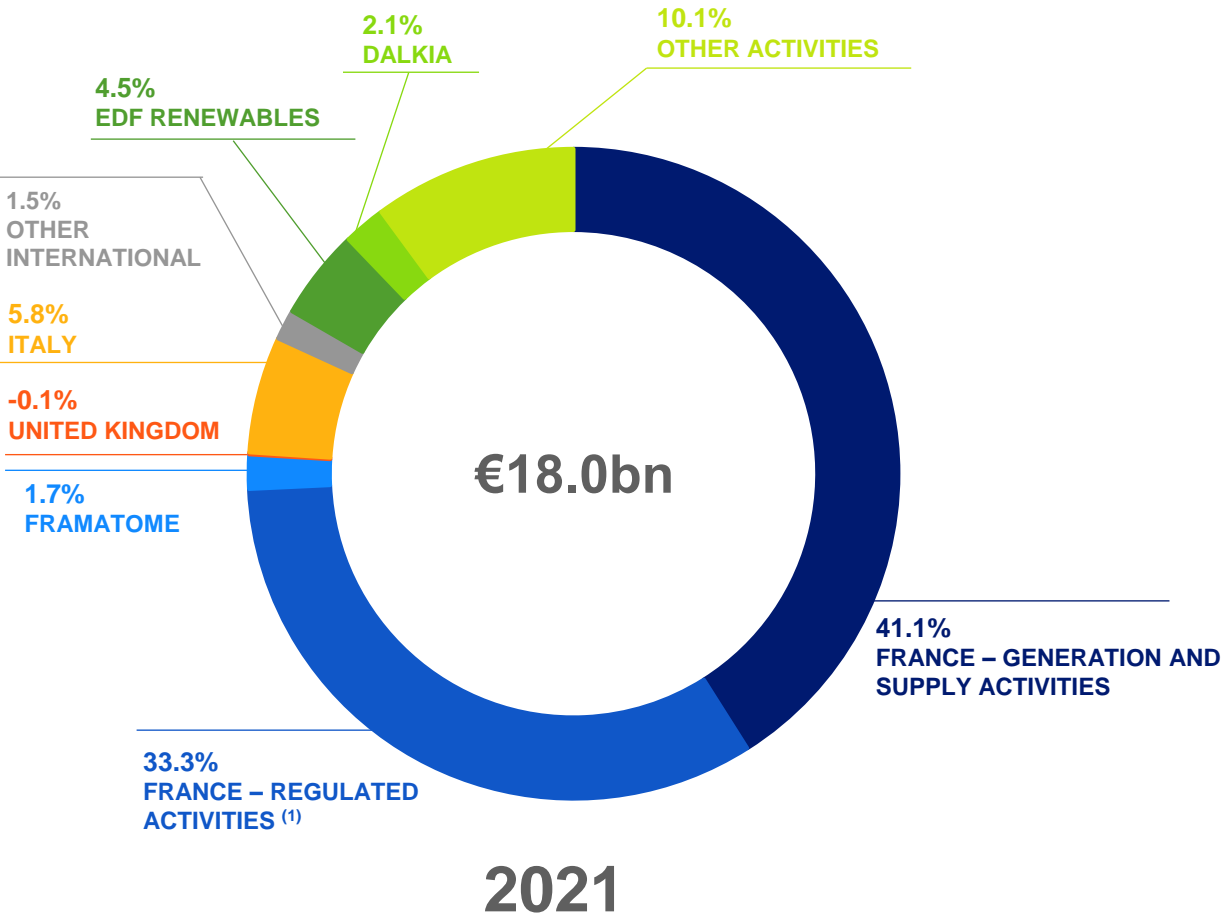
# HISTORICAL FINANCIALS: EBITDA

EBITDA evolution

In millions of euros



2021 Group EBITDA by segment

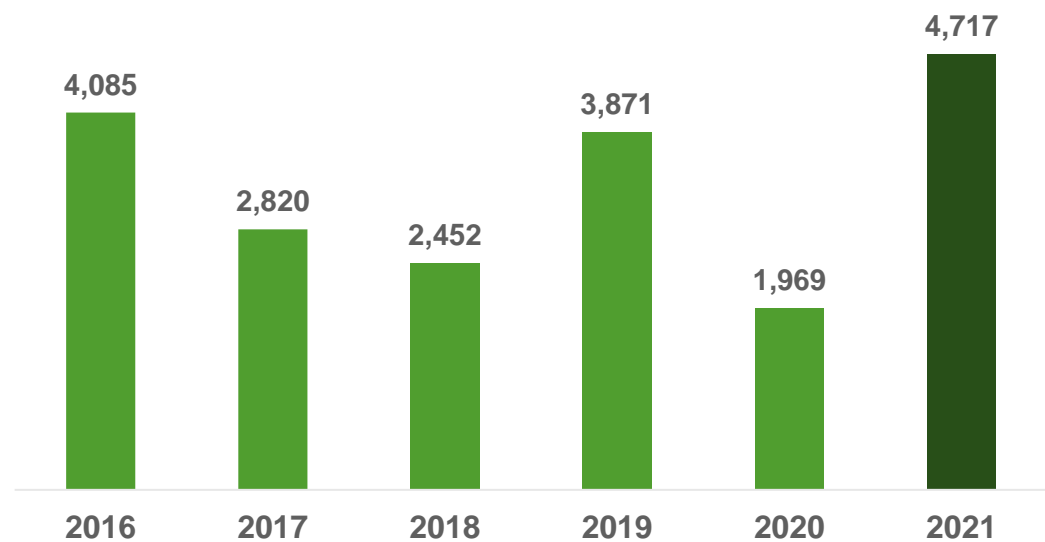


Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years  
(1) Regulated activities: Enedis, ÉS and island activities; Enedis, an independent EDF subsidiary as defined in the French energy code

# HISTORICAL FINANCIALS: NET INCOME

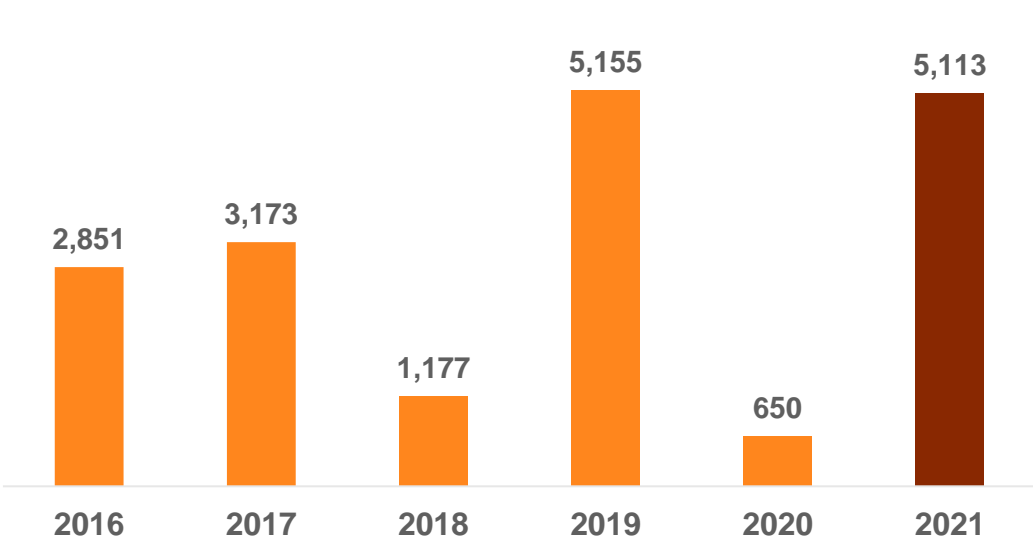
## Evolution of Net income excluding non-recurring items

*In millions of euros*



## Evolution of Net income – Group share

*In millions of euros*



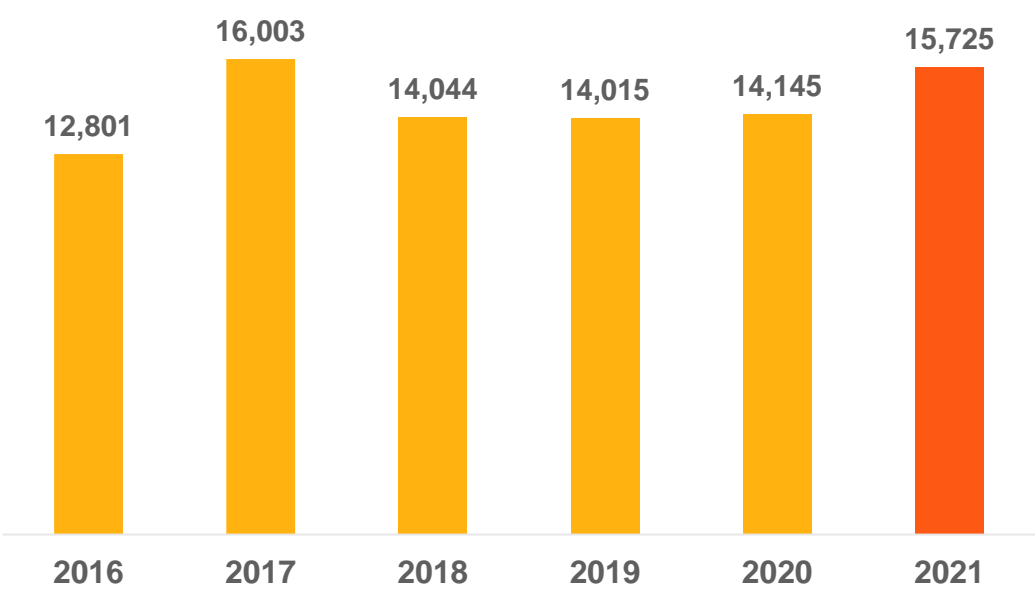
Net income excluding non-recurring items = Net income Group share excluding non-recurring items

*Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years*

# HISTORICAL FINANCIALS: INVESTMENTS AND OPEX

Net investments <sup>(1)</sup>

In millions of euros

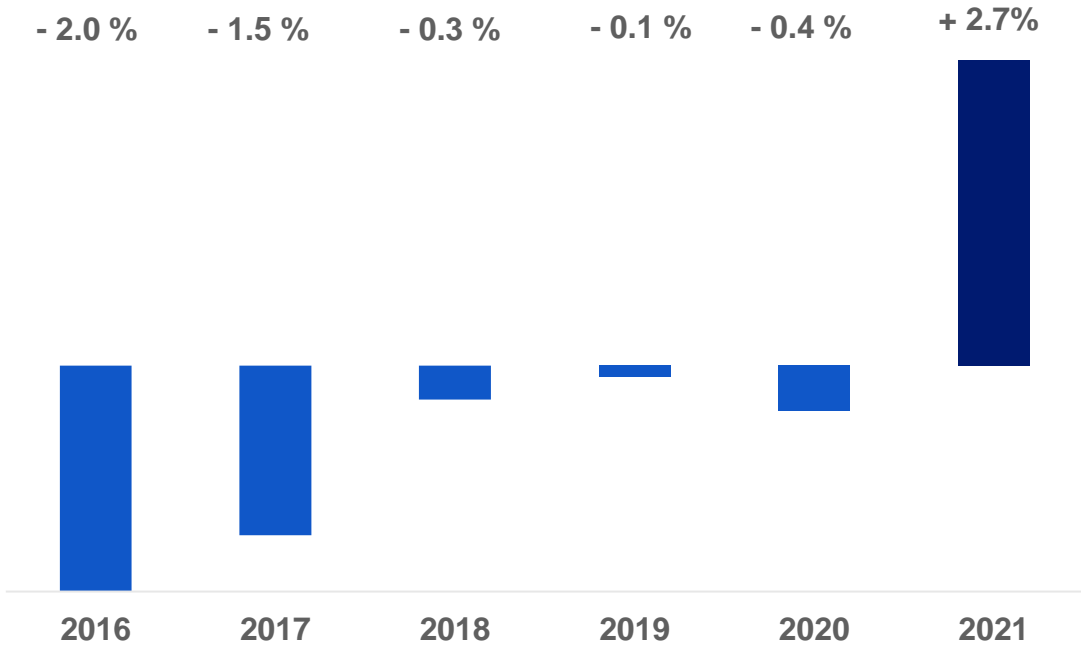


➤ 94% of Group investments were in line with the Group's net-zero trajectory

Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years

(1) Total net investments (as defined for each year) excluding disposals of strategic assets

OPEX organic change <sup>(2)</sup>



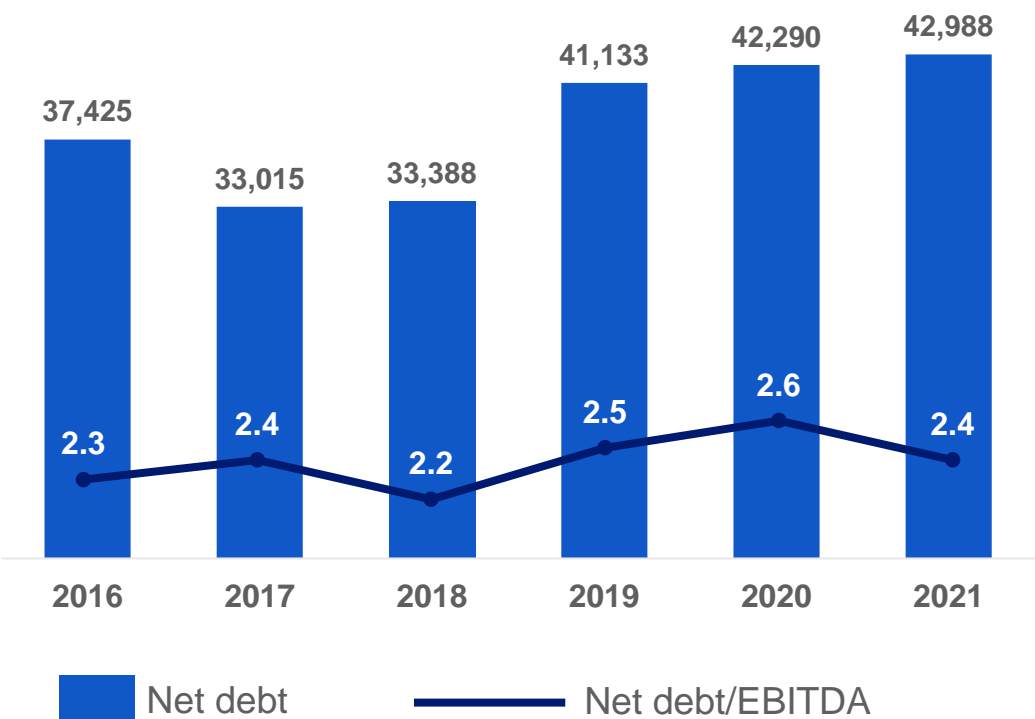
(2) Aggregate of personnel expenses and other external expenses. Data published with organic change at constant scope and exchange rates



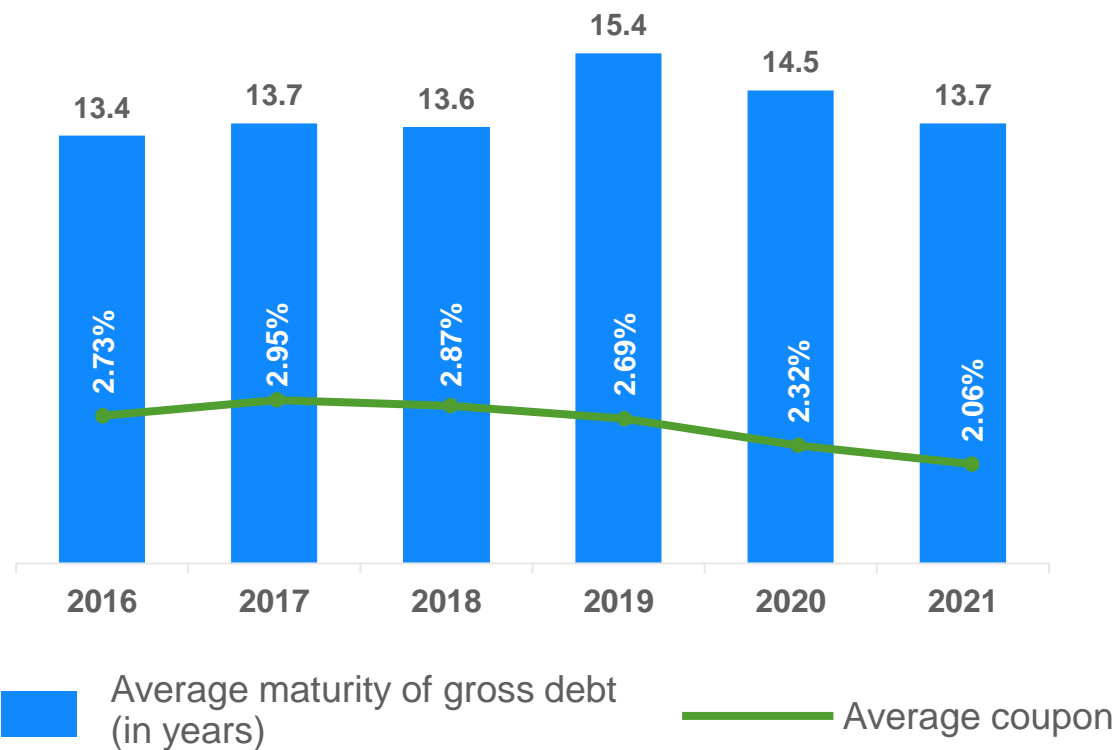
# HISTORICAL FINANCIALS: FINANCIAL DEBT

## Net debt and net debt/EBITDA evolution

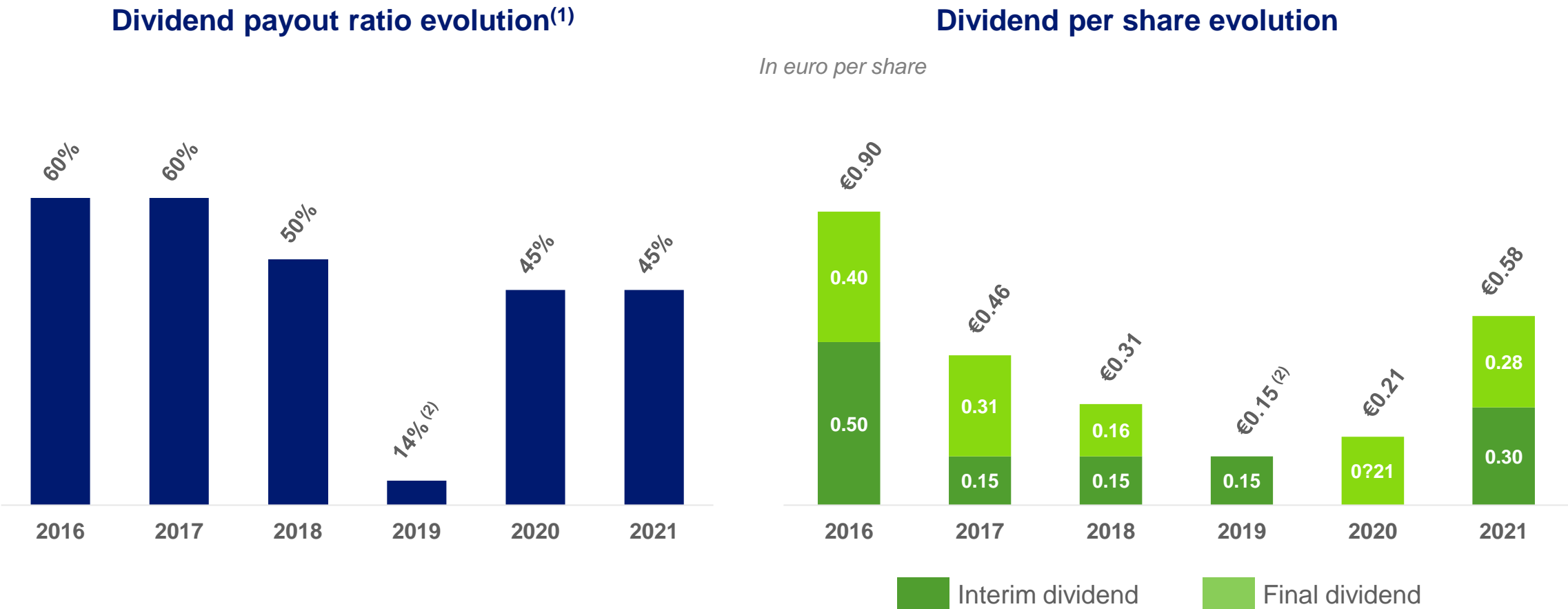
*In millions of euros*



## Debt maturity and coupon evolution



# HISTORICAL FINANCIALS: DIVIDEND



(1) Payout ratio applied to the Net result excluding non-recurring items adjusted for interest payments on hybrid issues booked in equity

(2) Cf Press release of 2 April 2020 : Board of Directors decision not to carry out the distribution of the balance of the dividend due to Covid-19 health crisis

# FINANCE

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# KEY FIGURES 2021 - ALL FINANCIAL TARGETS ACHIEVED

In €m	2020	2021	Δ %	Δ % Org. <sup>(1)</sup>
Sales	69,031	84,461	+22.4	+21.6
<b>EBITDA</b>	<b>16,174</b>	<b>18,005</b>	<b>+11.3</b>	<b>+11.3</b>
Net income excluding non-recurring items	1,969	4,717	x2.4	
<b>Net income – Group share</b>	<b>650</b>	<b>5,113</b>	<b>~x8</b>	

	31/12/2020	31/12/2021
<b>Net financial debt</b> (in €bn)	42.3	43.0
<b>Net financial debt/EBITDA</b>	2.61x	2.39x

## PROPOSED DIVIDEND

€**0.58** per share

PAYOUT RATIO OF 45% <sup>(2)</sup>

The French State has committed to scrip dividend

(1) Organic change at comparable scope, standards and exchange rates.

(2) Payout ratio based on net income excluding non-recurring items, adjusted for the remuneration of hybrid bonds accounted for in equity.

# SIMPLIFIED INCOME STATEMENT

In millions of euros	2020	2021
<b>Sales</b>	<b>69,031</b>	<b>84,461</b>
Fuel and energy purchases	(32,425)	(44,299)
Other external expenses	(8,461)	(8,595)
Personnel expenses	(13,957)	(14,494)
Taxes other than income taxes	(3,797)	(3,330)
Other operating income and expenses	5,783	4,262
<b>EBITDA</b>	<b>16,174</b>	<b>18,005</b>
Impact of the commodities volatility	(175)	(215)
Amortisation/depreciation expenses and provisions for renewal	(10,838)	(10,789)
(Impairment)/reversals	(799)	(653)
Other income and expenses	(487)	(1,123)
<b>EBIT</b>	<b>3,875</b>	<b>5,225</b>
Financial income	(2,582)	360
Income before taxes of consolidated companies	1,293	5,585
<b>Net income – Group share</b>	<b>650</b>	<b>5,113</b>
<b>Net income excl. non-recurring items <sup>(1)</sup></b>	<b>1,969</b>	<b>4,717</b>

(1) Excluding non-recurring items & commodities volatility

# CHANGE IN SALES (1)

In millions of euros	2020	Forex	Scope	Organic growth	2021	Δ% org. (2)
France – Generation and supply activities	28,361	-	1	4,820	33,182	+17.0
France – Regulated activities (3)	16,228	-	-	1,336	17,564	+8.2
Framatome	3,295	(22)	27	62	3,362	+1.9
United Kingdom	9,041	306	5	762	10,114	+8.4
Italy	5,967	-	(13)	5,258	11,212	+88.1
Other international	2,420	(43)	295	681	3,353	+28.1
EDF Renewables	1,582	(6)	(3)	194	1,767	+12.3
Dalkia	4,212	13	(35)	1,006	5,196	+23.9
Other activities	2,127	(10)	(3)	1,791	3,905	+82.2
Inter-segment eliminations	(4,202)	-	-	(992)	(5,194)	+23.6
<b>Total Group</b>	<b>69,031</b>	<b>238</b>	<b>274</b>	<b>14,918</b>	<b>84,461</b>	<b>+21.6</b>

(1) Breakdown of sales across the segments, before inter-segment eliminations

(2) Organic change at constant scope and exchange rates

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



# CHANGE IN EBITDA (1)

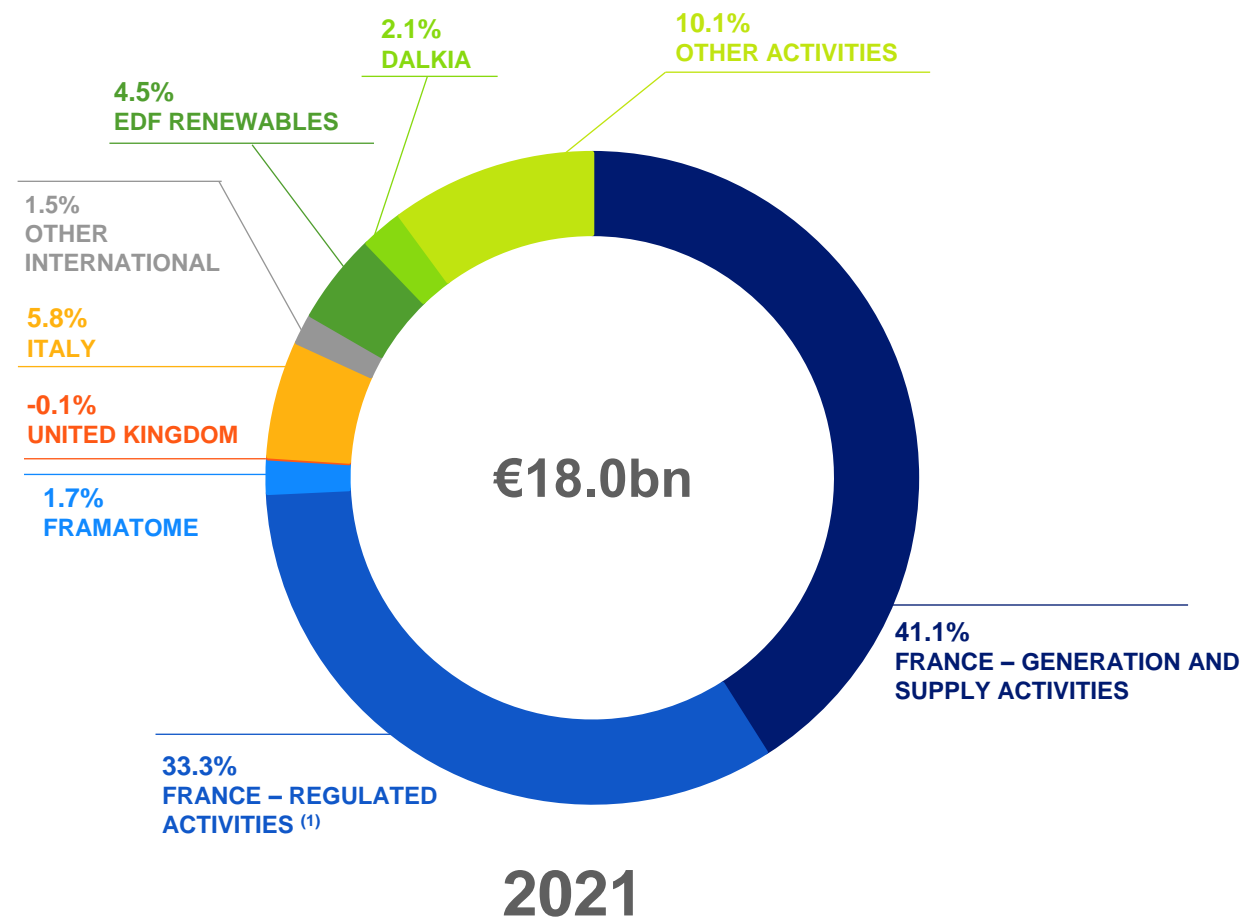
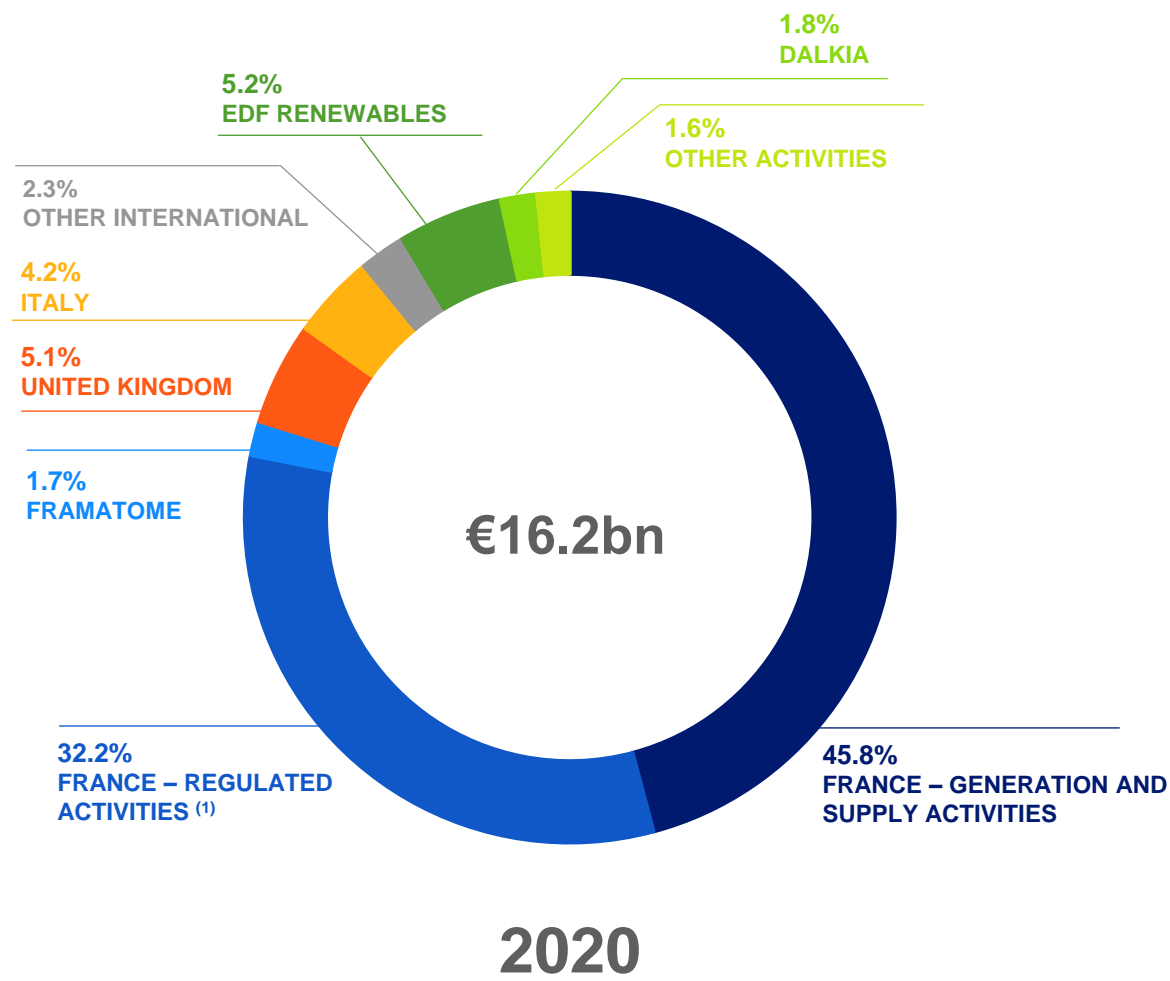
In millions of euros	2020	Forex	Scope	Organic growth	2021	Δ% org. (2)
France – Generation and supply activities	7,412	-	3	(21)	7,394	-0.3
France – Regulated activities (3)	5,206	-	-	786	5,992	+15.1
Framatome	271	(3)	(8)	50	310	+18.5
United Kingdom	823	28	17	(889)	(21)	-108.0
Italy	683	-	1	362	1,046	+53.0
Other international	380	(10)	(16)	(87)	267	-22.9
EDF Renewables	848	(3)	1	(31)	815	-3.7
Dalkia	290	(1)	(3)	92	378	+31.7
Other activities	261	(2)	2	1,563	1,824	x7
<b>Total Group</b>	<b>16,174</b>	<b>9</b>	<b>(3)</b>	<b>1,825</b>	<b>18,005</b>	<b>+11.3</b>

(1) Contribution to the Group

(2) Organic change at constant scope, standard and exchange rates

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

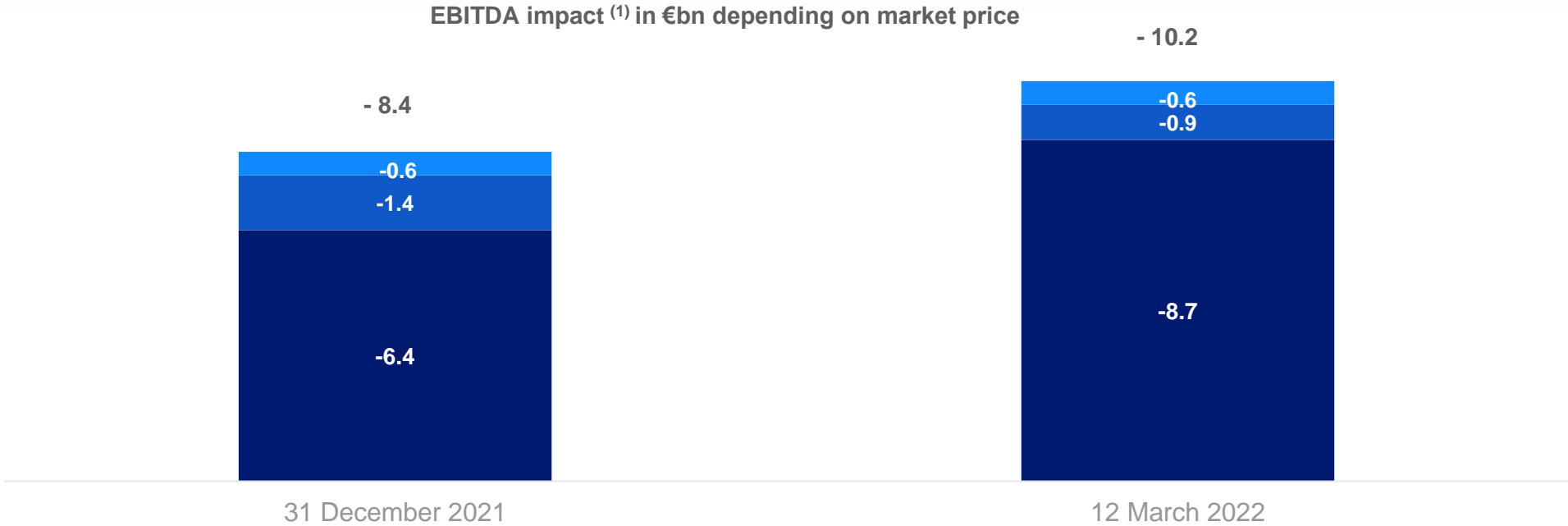
# BREAKDOWN OF GROUP EBITDA



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

# REGULATORY MEASURES IMPACTS TO 2022 EBITDA

- Measures' EBITDA impact according to published decree on 12 March 2022** based on an average of forward market prices between 2 and 23 December 2021 (257€/MWh) :
- An **additional 20TWh of ARENH at €46.2/MWh** to be delivered from April to December 2022 to alternative suppliers whose demand was capped following the end-2021 auction : impact estimated at around **-€4.2bn**
  - The impact of this additional allocation is replicated in **EDF offers (regulated tariffs and market offers)**: impact estimated at around **-€4.5bn**
  - **Margin level freeze in €/MWh for residential regulated tariffs**: impact estimated at around **-€0.6bn**
  - **Portion of the 2022 residential regulated tariff postponed to 2023**, aiming at limiting the increase to 4% including taxes **and an extension of residential regulated tariff measures to the professional regulated tariff and non-interconnected zones** (freeze in margin level and tariff postponement): impact estimated at around **-€0.9bn**



(1) Illustrative figures

■ Rise of ARENH ceiling      ■ Tariff postponement      ■ Freeze on margin level of residential regulated tariff in €/MWh

# NET INCOME EXCL. NON-RECURRING ITEMS

In €m	2020 current	2020 non current	2020	2021 Current	2021 non current	2021
<b>EBITDA</b>	16,174	-	<b>16,174</b>	18,005	-	<b>18,005</b>
Commodities volatility	-	175	<b>(175)</b>	-	215	<b>(215)</b>
Amortisation/depreciation expenses and provisions for renewal	(10,568)	270	<b>(10,838)</b>	(10,789)	-	<b>(10,789)</b>
Impairments and other operating income and expenses	-	1,286	<b>(1,286)</b>	-	1,776	<b>(1,776)</b>
<b>EBIT</b>	5,606	1,731	<b>3,875</b>	7,216	1,991	<b>5,225</b>
Financial result	(3,705)	(1,123)	<b>(2,582)</b>	(2,437)	(2,797)	<b>360</b>
Income tax	(361)	584	<b>(945)</b>	(1,019)	381	<b>(1,400)</b>
Share of net income from associates and joint-ventures	547	122	<b>425</b>	787	143	<b>644</b>
Net income of discontinued operations	(41)	117	<b>(158)</b>	(1)	-	<b>(1)</b>
Deduction net income from minority interests	77	112	<b>(35)</b>	(171)	114	<b>(285)</b>
<b>Net income – Group share</b>	1,969	1,319	<b>650</b>	4,717	(396)	<b>5,113</b>

# SIMPLIFIED BALANCE SHEET

<b>ASSETS</b> (in millions of euros)	<b>31/12/2020</b>	<b>31/12/2021</b>	<b>LIABILITIES</b> (in millions of euros)	<b>31/12/2020</b>	<b>31/12/2021</b>
Intangible and tangible assets	179,658	188,416	Equity (EDF's share)	45,633	50,211
Other non-current assets	57,574	67,452	Equity (non-controlling interests)	9,593	11,778
<b>Non-current assets</b>	<b>237,232</b>	<b>255,868</b>	<b>Total equity</b>	<b>55,226</b>	<b>61,989</b>
Inventories and trade receivables	29,259	38,432	Non-current provisions	85,837	89,225
Other current assets	30,834	56,678	Special distribution concession liabilities	48,420	48,853
Cash and cash equivalents	6,270	9,919	Non-current other liabilities	63,888	63,760
<b>Current assets</b>	<b>66,363</b>	<b>105,029</b>	<b>Non current liabilities</b>	<b>198,145</b>	<b>201,838</b>
Assets held for sale	2,296	69	<b>Current liabilities</b>	<b>52,412</b>	<b>97,109</b>
<b>Total assets</b>	<b>305,891</b>	<b>360,966</b>	Liabilities related to assets classified as held for sale	108	30
			<b>Total liabilities</b>	<b>305,891</b>	<b>360,966</b>

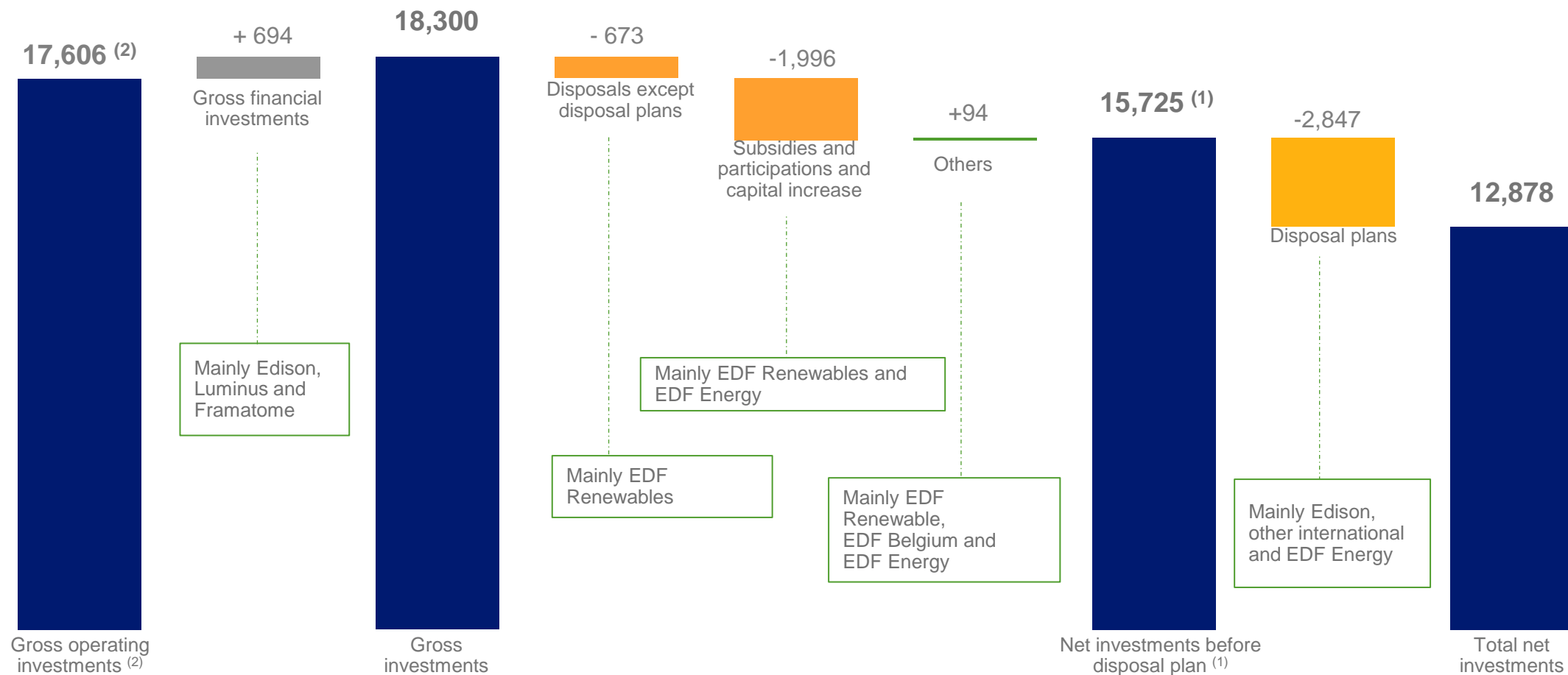
# CHANGE IN CASH FLOW

In €m	2020	2021
<b>EBITDA</b>	<b>16,174</b>	<b>18,005</b>
Non-cash items	328	(869)
<b>EBITDA Cash</b>	<b>16,502</b>	<b>17,136</b>
Δ WCR	(1,679)	(1,526)
Net investments <i>(including HPC and Linky <sup>(2)</sup>, excluding Group assets disposal plan)</i>	(14,145)	(15,725)
Other items o/w dividends received from associates and group ventures	(17)	(98)
<b>Cash flow generated by operations</b>	<b>661</b>	<b>(213)</b>
Group assets disposal plan	187	187
Income tax paid	(983)	(2,276)
Net financial expenses disbursed	(929)	(588)
Dedicated assets	(828)	(501)
Dividends paid in cash (including hybrid bonds remuneration)	(768)	(794)
<b>Group cash flow</b>	<b>(2,660)</b>	<b>(1,525)</b>

(1) Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code.



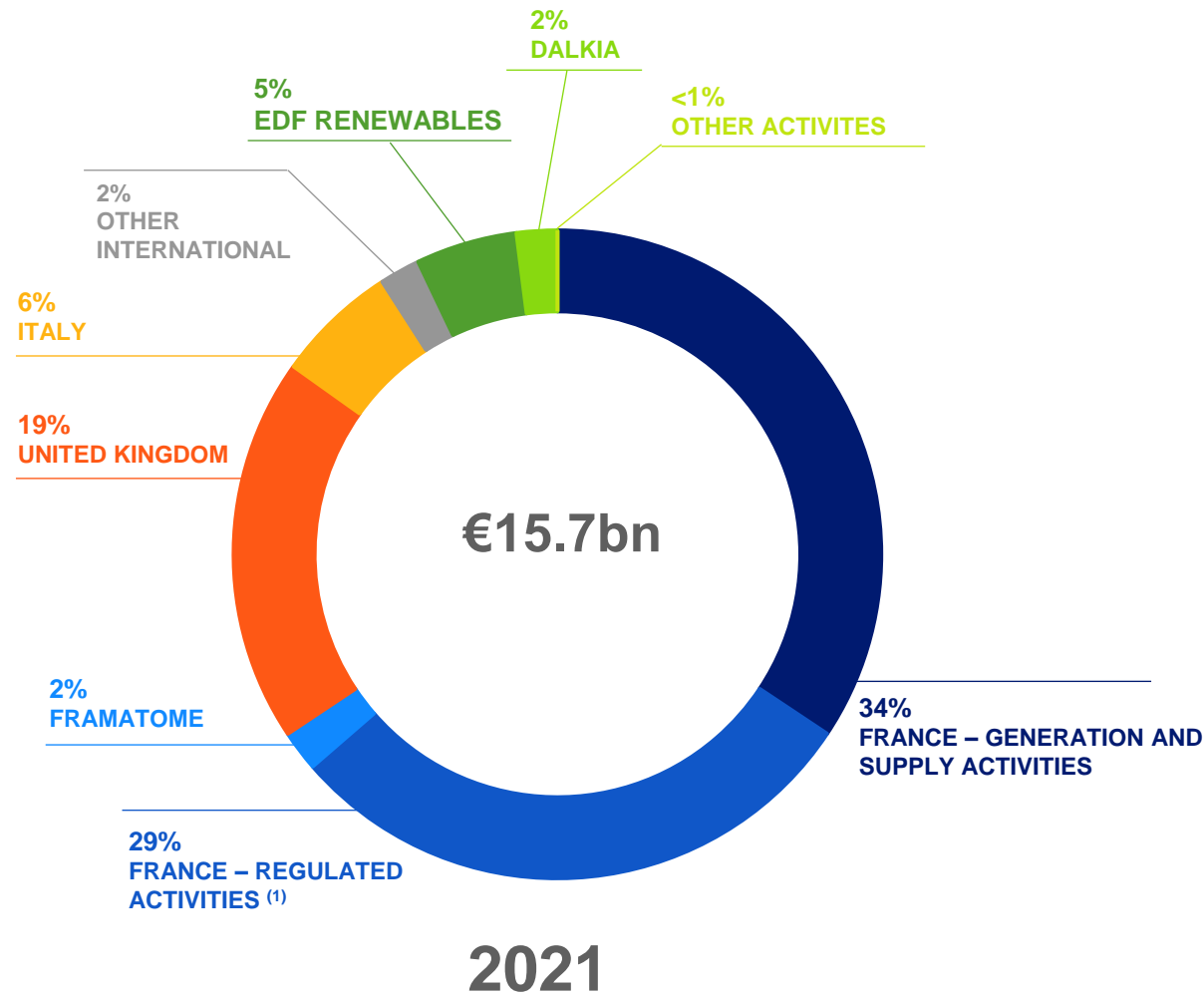
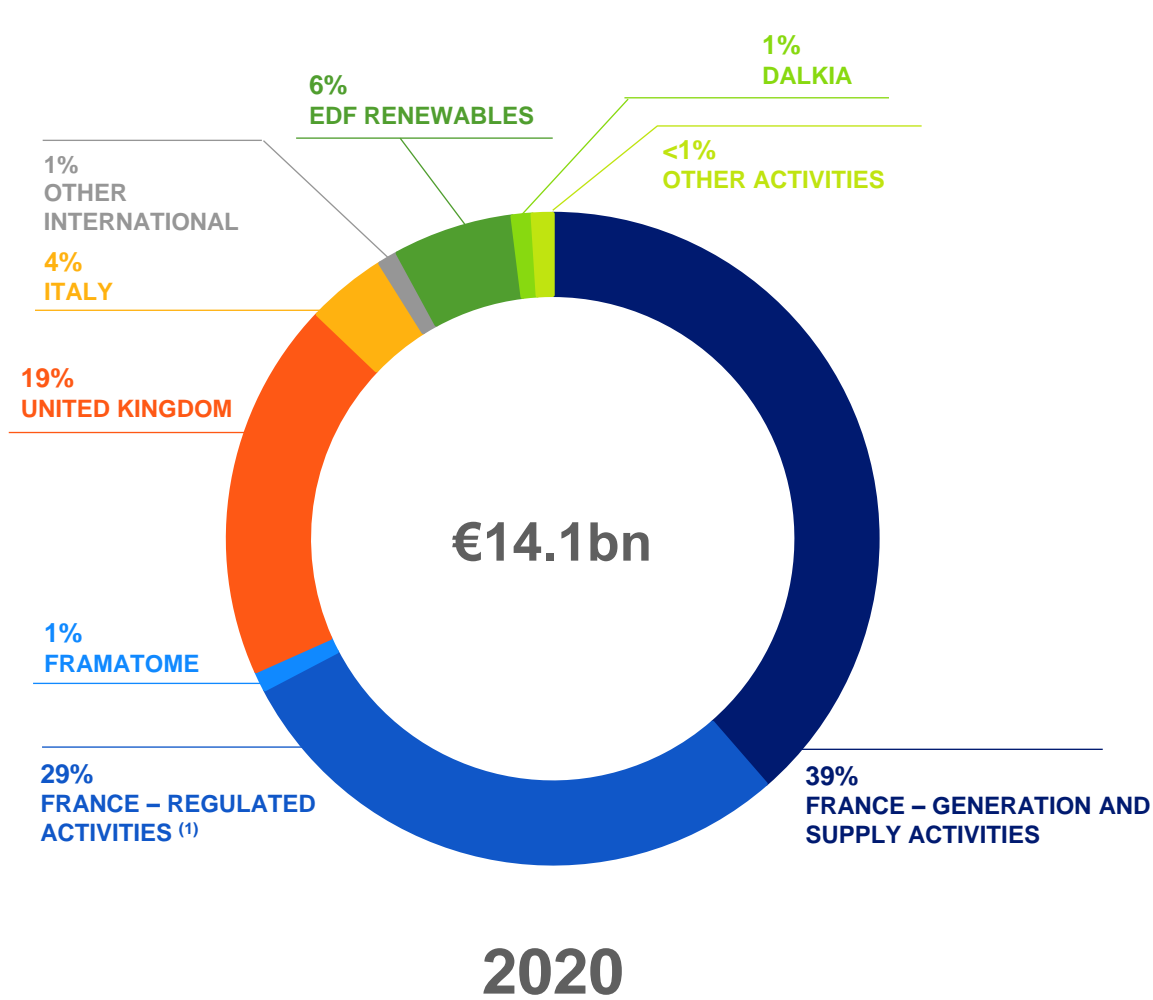
# INVESTMENTS: FROM GROSS TO NET <sup>(1)</sup>



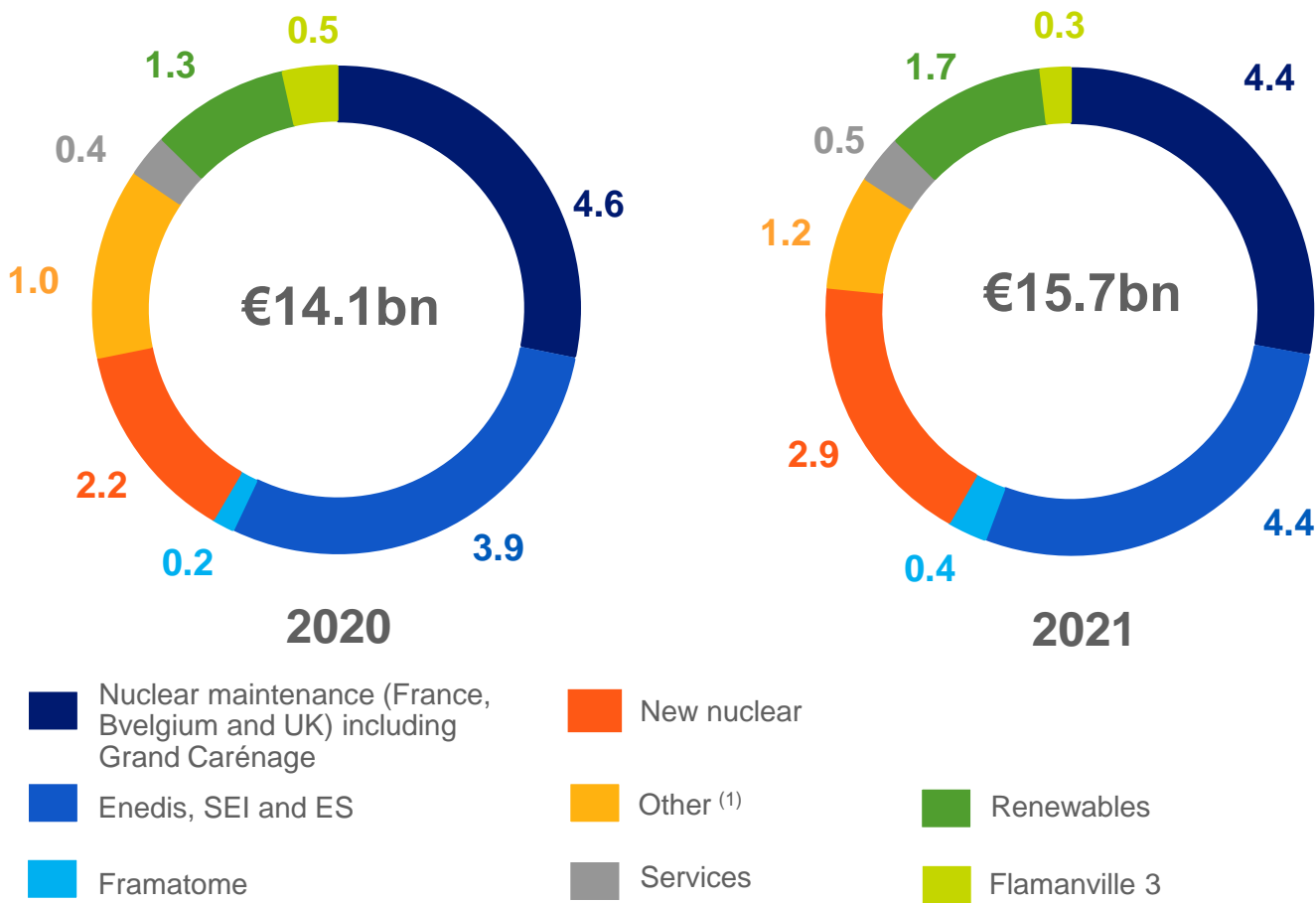
(1) Net investments in the Change in NFD statement including Linky, HPC and assets disposals

(2) Investments in intangible assets and property, plant and equipment in consolidated cash flow statement

# NET TOTAL INVESTMENTS INCLUDING ACQUISITIONS, EXCLUDING 2015-2020 DISPOSAL PLAN



# NET INVESTMENTS INCLUDING ACQUISITIONS EXCLUDING 2015-2020 DISPOSAL PLAN



NB: figures rounded up to the nearest decimal number  
 (1) Mainly thermal maintenance, gas, property, central functions,

2021 data

In billions of euros	Maintenance	Development	TOTAL
Renewables	0.3	1.4	1.7
Nuclear maintenance (France, Belgium and UK) including Grand Carénage	4.4	-	4.4
Enedis, SEI and ES	1.8	2.7	4.4
Framatome	0.1	0.3	0.4
Project Flamanville 3	-	0.3	0.3
Services	0.1	0.4	0.5
New nuclear	-	2.9	2.9
Other <sup>(1)</sup>	0.4	0.7	1.2
<b>TOTAL</b>	<b>7.1</b>	<b>8.6</b>	<b>15.7</b>

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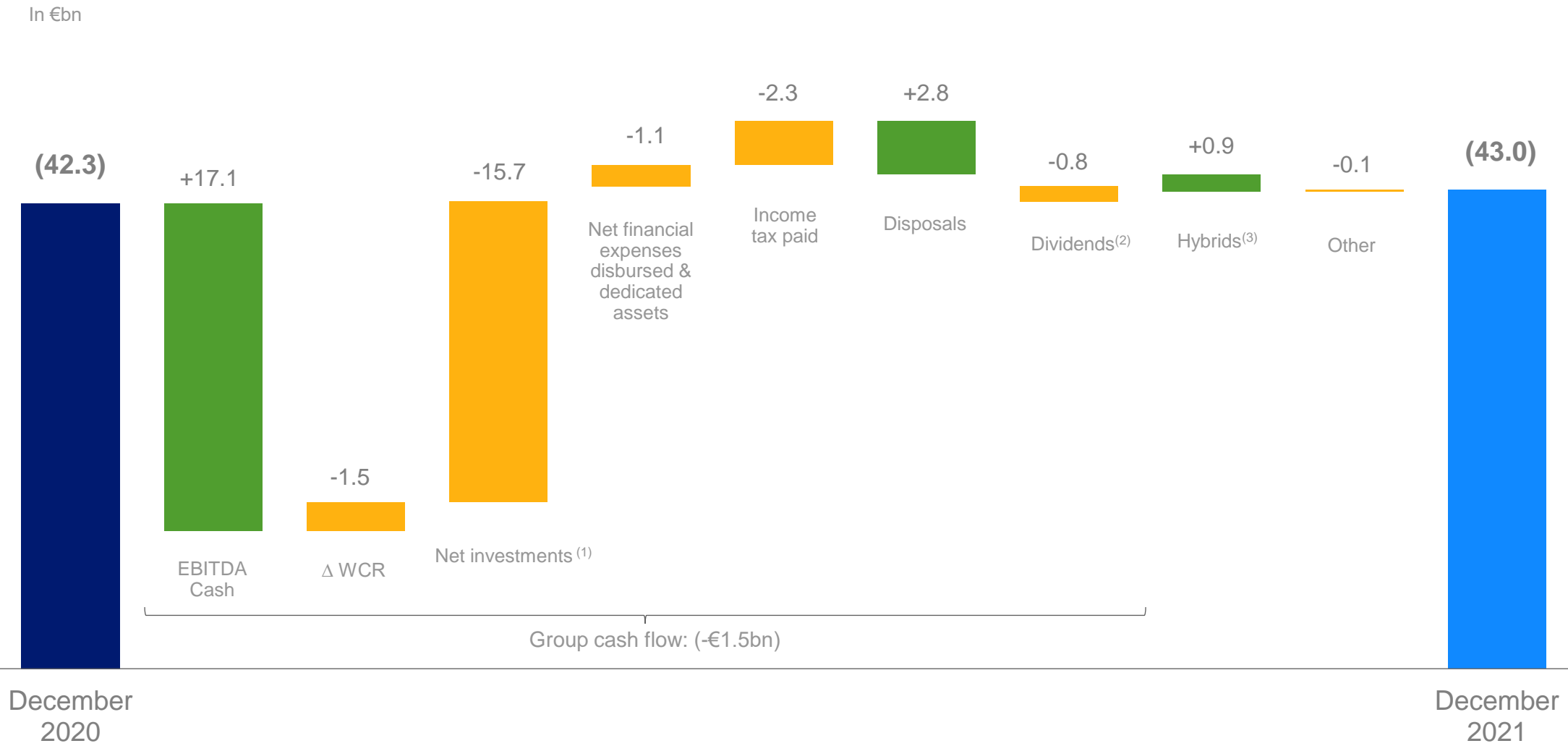
# DEBT AND LIQUIDITY

In billions of euros

	31/12/2019	31/12/2020	31/12/2021
<b>Net financial debt</b>	41.1	42.3	<b>43.0</b>
Net financial debt/EBITDA	2.46x	2.61x	<b>2.39x</b>
<b>Debt</b>			
• Bonds	52.4	50.2	<b>49.2</b>
• Average maturity of gross debt (in years)	15.4	14.5	<b>13.7</b>
• Average coupon	2.69%	2.32%	<b>2.06%</b>
<b>Gross liquidity <sup>(1)</sup></b>	33.4	32.4	<b>35.7</b>

(1) With cash and cash equivalents, liquid assets, and undrawn lines of credit

# NET DEBT



NB: figures rounded up to the nearest whole number.

(1) Net investments excluding Group disposals.

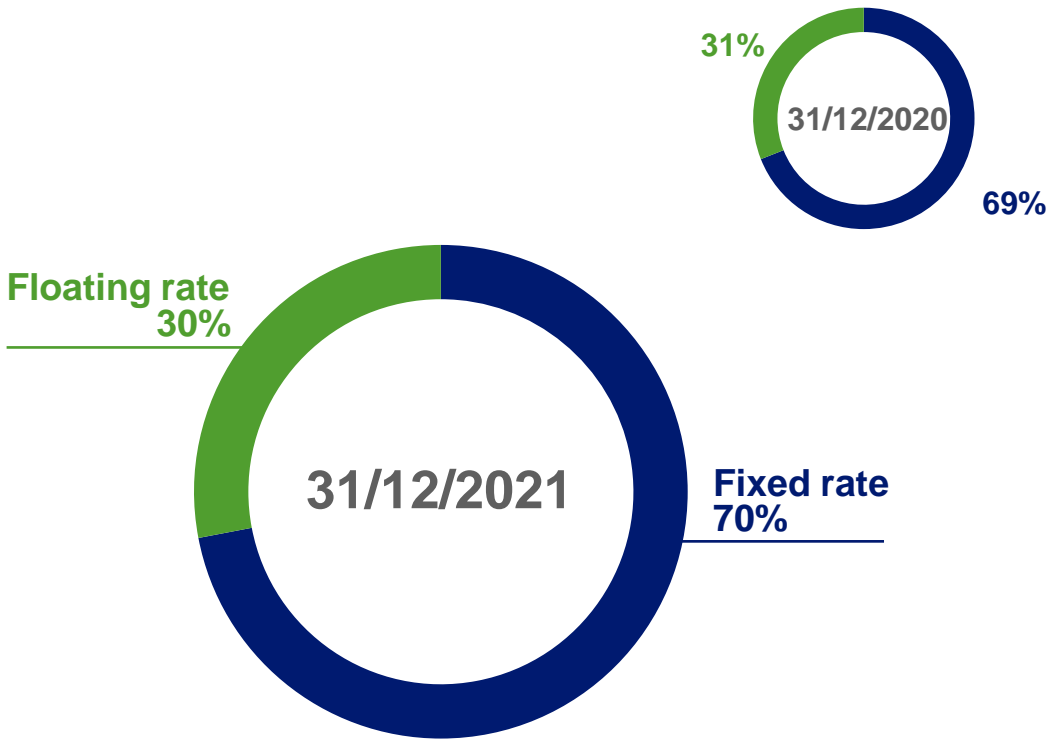
(2) Dividends paid including hybrid bond remuneration.

(3) Hybrid issue of €1.2bn and announced repayment of -€0.3bn

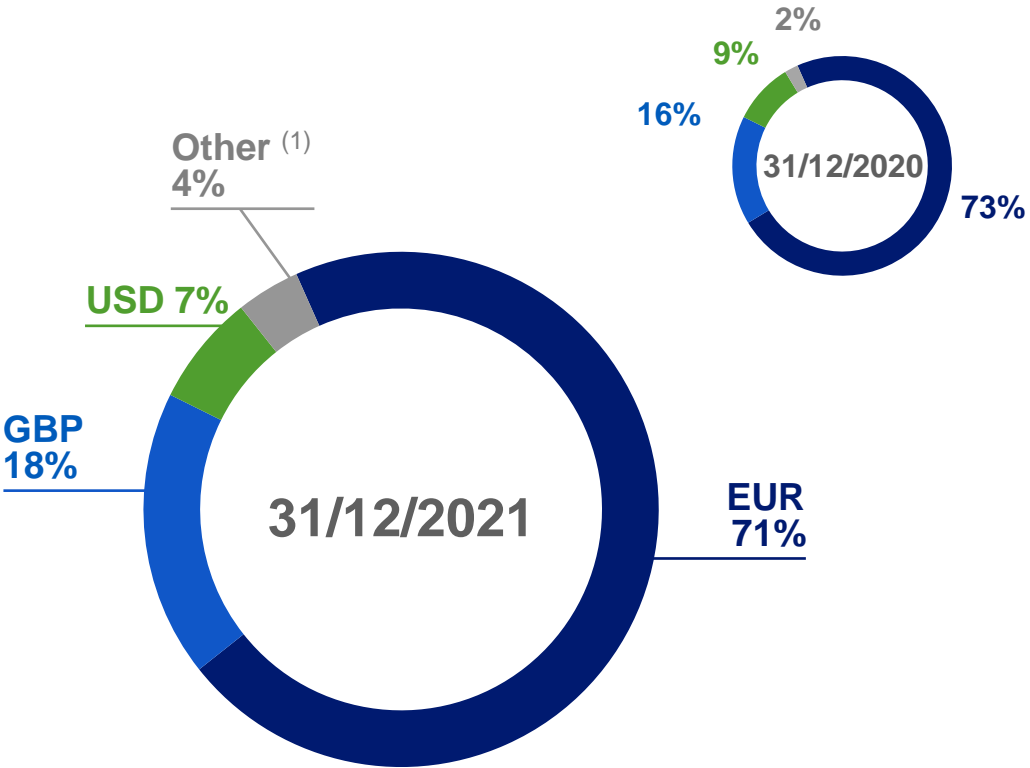


# GROSS FINANCIAL DEBT AFTER SWAPS

BREAKDOWN BY TYPE OF RATE



BREAKDOWN BY CURRENCY

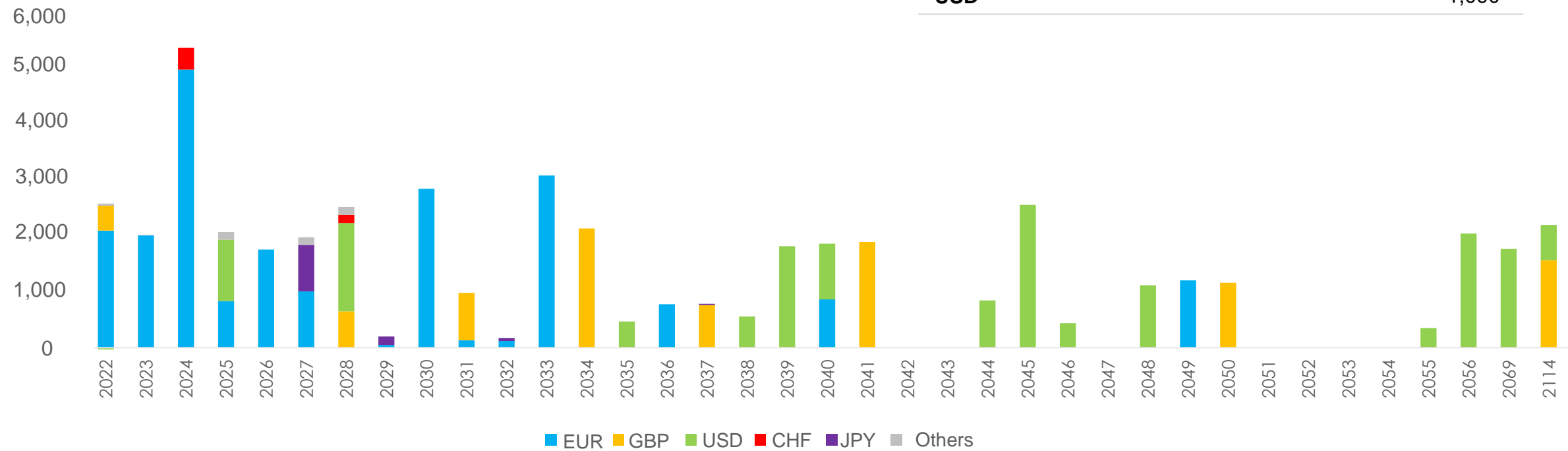


(1) Mainly CHF, PLN, CAD and JPY

# BREAKDOWN OF BOND DEBTS BY CURRENCY

In millions of euros, before swaps

Including (In €m equivalent)	2022	2023	2024	2025
EUR	2,086	1,998	4,949	832
GBP	442	-	-	-
USD	-	-	-	1,090



# MAIN OUTSTANDING BONDS AS OF 31 DECEMBER 2021 (1/2)

	Issue date <sup>(1)</sup>	Maturity	Nominal amount <i>(in millions of currency units)</i>	Currency	Coupon
	01/2012	01/2022	2,000	EUR	3.88%
	09/2012	03/2023	2,000	EUR	2.75%
	09/2009	09/2024	2,500	EUR	4.63%
	09/2020	09/2024	2,400	EUR	0.00%
Green Bond	10/2015	10/2025	1,250	USD	3.63%
	11/2010	11/2025	750	EUR	4.00%
Green Bond	10/2016	10/2026	1,750	EUR	1.00%
	01/2017	01/2027	107,900	JPY	1.09%
	03/2012	03/2027	1,000	EUR	4.13%
	09/2018	09/2028	1,800	USD	4.50%
	04/2010	04/2030	1,500	EUR	4.63%
	10/2018	10/2030	1,000	EUR	2.00%
	07/2001	07/2031	650	GBP	5.88%
	02/2003	02/2033	850	EUR	5.63%

(1) Date of funds reception


# MAIN OUTSTANDING BONDS AS OF 31 DECEMBER 2021 (2/2)

Green Bond

Issue date <sup>(1)</sup>	Maturity	Nominal amount (in millions of currency units)	Currency	Coupon
11/2021	11/2033	1,850	EUR	1.00%
06/2009	06/2034	1,500	GBP	6.13%
10/2016	10/2036	750	EUR	1.88%
09/2018	09/2038	650	USD	4.88%
01/2009	01/2039	1,750	USD	6.95%
01/2010	01/2040	850	USD	5.60%
11/2010	11/2040	750	EUR	4.50%
10/2011	10/2041	1,250	GBP	5.50%
01/2014	01/2044	1,000	USD	4.88%
10/2015	10/2045	1,500	USD	4.75%
10/2015	10/2045	1,150	USD	4.95%
09/2018	09/2048	1,300	USD	5.00%
12/2019	12/2049	1,250	EUR	2.00%
09/2010	09/2050	1,000	GBP	5.13%
10/2016	10/2056	2,164	USD	4.99%
11/2019	12/2069	2,000	USD	4.50%
01/2014	01/2114	700	USD	6.00%
01/2014	01/2114	1,350	GBP	6.00%

(1) Date of funds reception

# FOCUS ON HYBRIDS SECURITIES



OVERVIEW OF  
KEY ELEMENTS

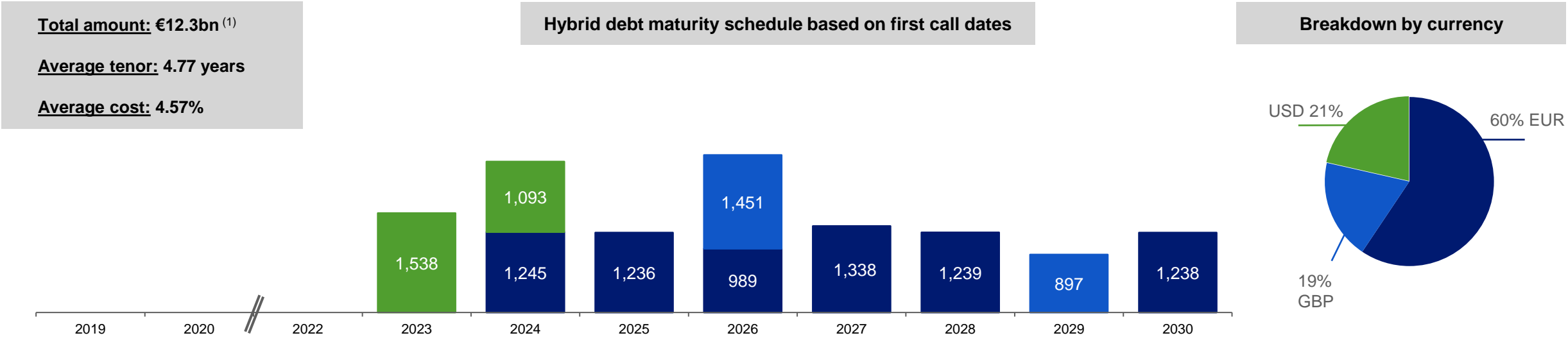
### Hybrid issue

Hybrid issues contribute to strengthening the balance sheet through their qualification as equity under IFRS and 50/50 as debt and equity by rating agencies

New issue in May 2021 of euro-denominated hybrid notes for a total nominal amount of €1,250 million with an initial coupon of 2.625%

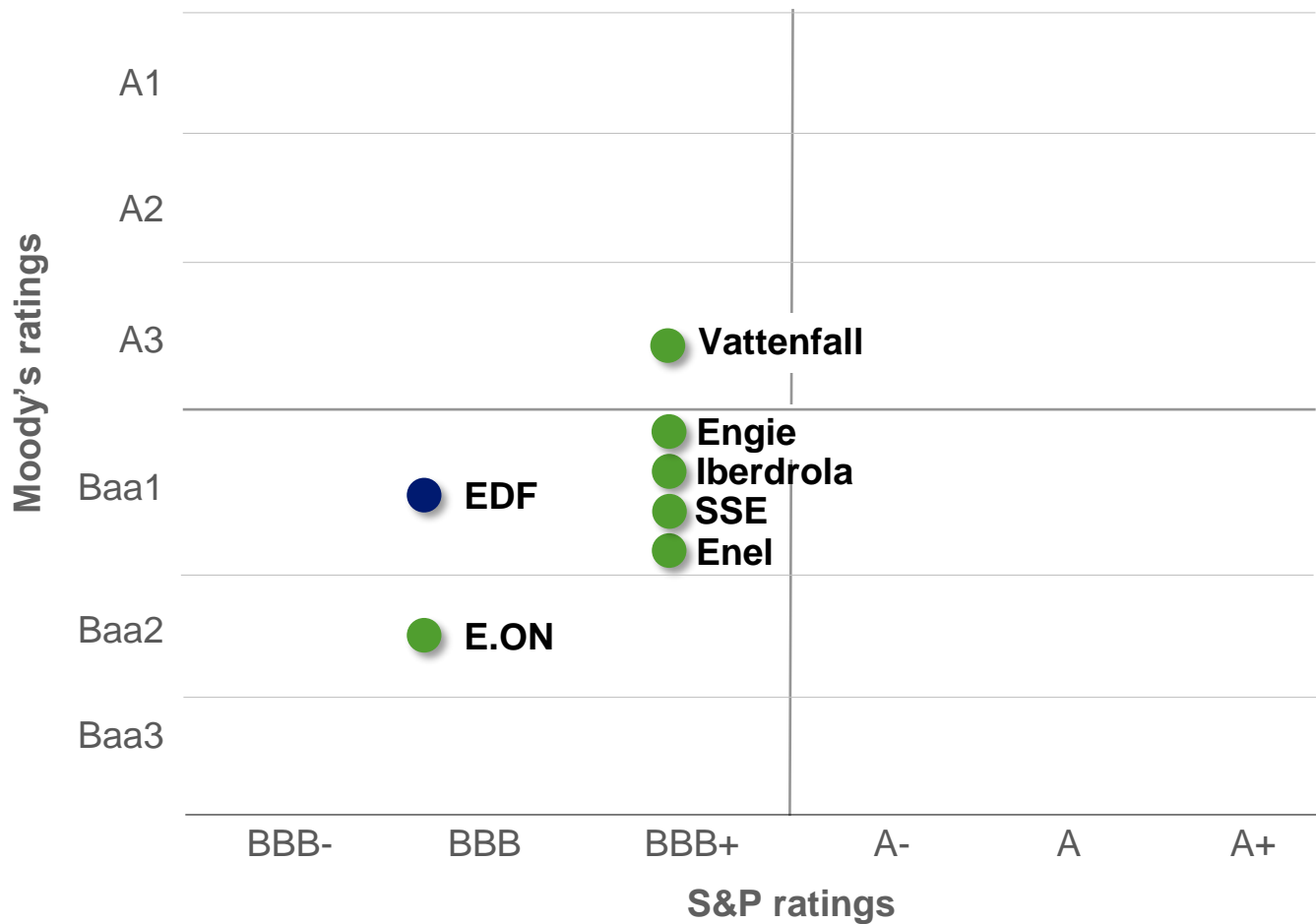
These issues allowed to extend the maturity of the stock of hybrids and to reduce the average coupon

## Hybrid securities snapshot following new issues (in millions of euros) <sup>(1)</sup>



(1) Exchange rate as of transaction time

# COMPARATIVE CREDIT RATINGS



	S&P ratings	Moody's ratings	Fitch ratings
EDF	BBB negative <sup>(1)</sup>	Baa1 negative <sup>(2)</sup>	BBB+ negative <sup>(3)</sup>
Engie	BBB+ stable	Baa1 stable	A- stable
Vattenfall	BBB+ positive	A3 stable	n.d.
SSE	BBB+ stable	Baa1 stable	BBB stable
Iberdrola	BBB+ stable	Baa1 stable	BBB+ stable
Enel	BBB+ stable	Baa1 stable	BBB+ stable
E.ON	BBB stable	Baa2 stable	BBB+ stable
Uniper	BBB Watch negative	n.d.	n.d.
RWE	n.d	Baa2 stable	BBB+ stable

Sources: rating agencies as of 15/04/2022  
(1) Update of the rating and outlook of EDF Group by S&P on 21 February 2022  
(2) Update of the rating and outlook of EDF Group by Moody's on 21 February 2022  
(3) Update of the rating and outlook of EDF Group by Fitch on 2 March 2022



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# GROUP PROVISIONS

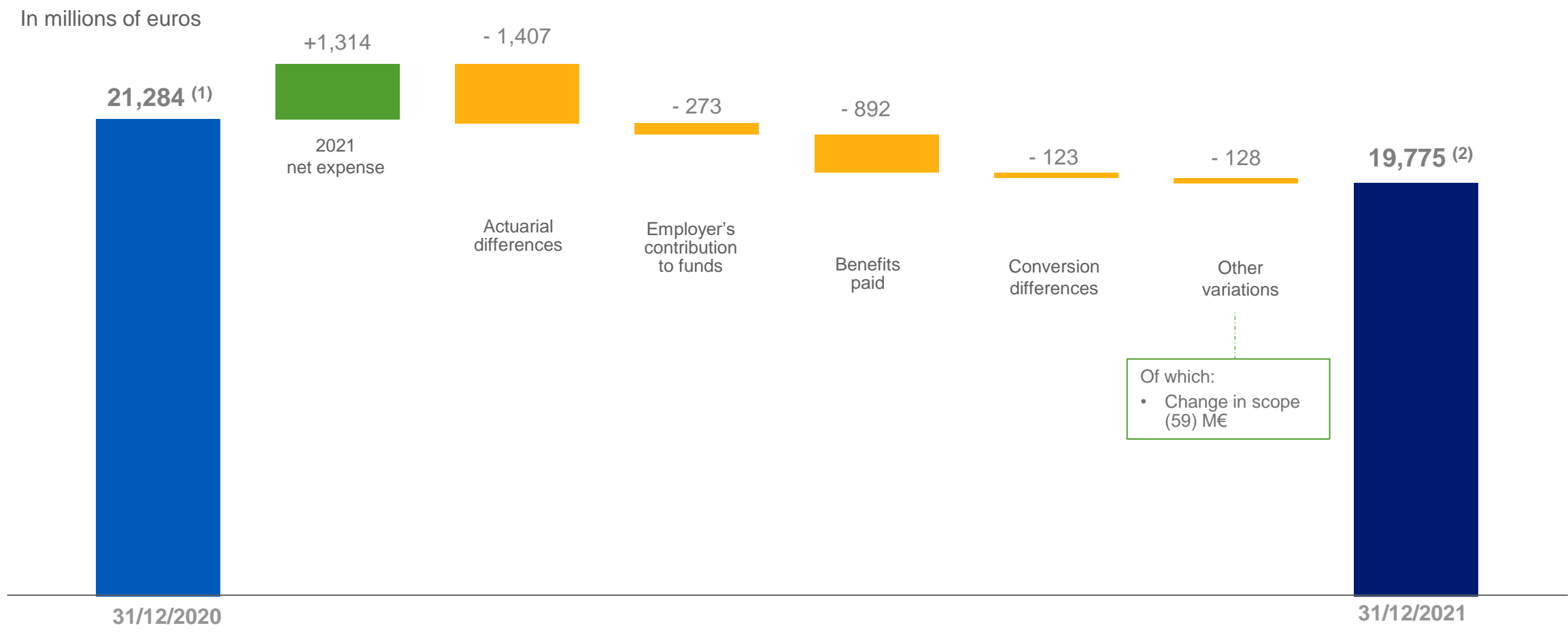
## 31 December 2020

In millions of euros	Current	Non Current	Total
Provisions for back-end nuclear cycle	1,430	26,137	<b>27,567</b>
Provisions for nuclear decommissioning and last cores	723	32,196	<b>32,919</b>
Other provisions for decommissioning	120	1,744	<b>1,864</b>
Provisions for employee benefits	879	22,130	<b>23,009</b>
Other provisions	2,675	3,630	<b>6,305</b>
<b>Total Provisions</b>	<b>5,827</b>	<b>85,837</b>	<b>91,664</b>

## 31 December 2021

Current	Non Current	Total
1,359	28,155	<b>29,514</b>
1,346	33,912	<b>35,258</b>
95	1,872	<b>1,967</b>
791	21,716	<b>22,507</b>
3,245	3,570	<b>6,815</b>
<b>6,836</b>	<b>89,225</b>	<b>96,061</b>

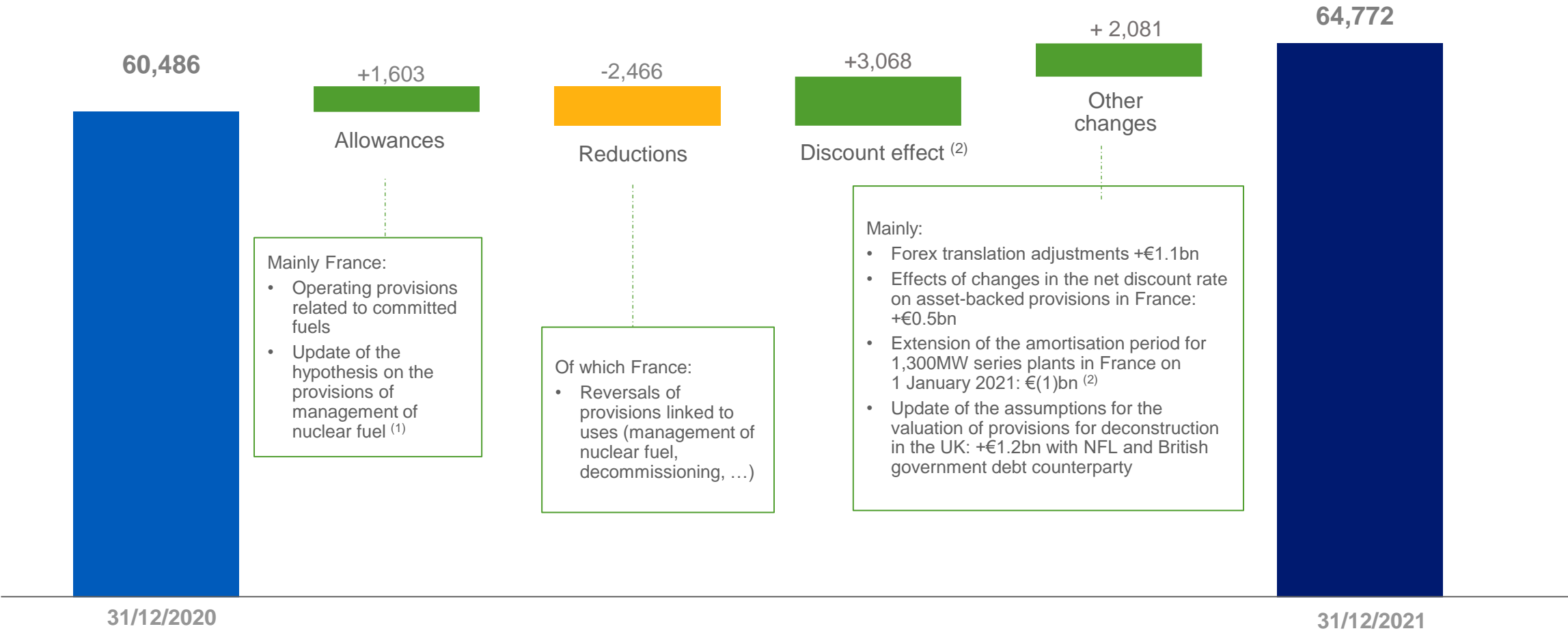
# GROUP PROVISIONS FOR EMPLOYEE BENEFITS: CHANGE IN NET LIABILITY



(1) Including: provisions for employee benefits €23,009m and non-current financial assets €(1,725)m  
(2) Including: provisions for employee benefits €22,508m and non-current financial assets €(2,733)m

# GROUP NUCLEAR PROVISIONS

In millions of euros



(1) See note 15.1.1.1 of the consolidated financial statements at 31 December 2021

(2) Impacts on the income statement of which France +€2,091m (+€1,474m of discount unwinding and +€617m of effects of changes in the real discount rate on provisions not backed by assets) and United Kingdom +€968m (accretion – note a symmetrical effect linked to the accretion of receivables from the Nuclear Liabilities Fund (NFL) and the British Government leading to an effect on the income statement)

# FRANCE NUCLEAR PROVISIONS

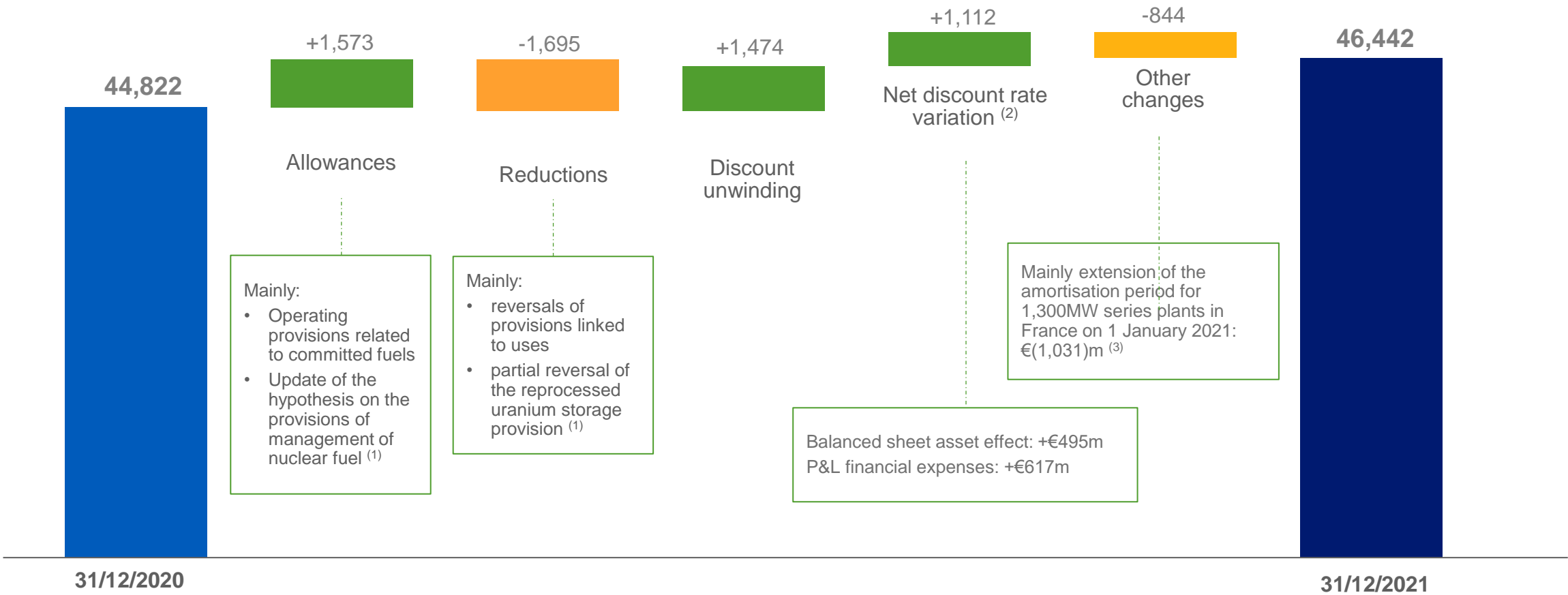
In millions of euros	31/12/2020	Net allowances	Discount effect	Other changes <sup>(1)</sup>	31/12/2021
<b>Total provisions for back-end nuclear cycle</b>	<b>24,622</b>	<b>(198)</b>	<b>1,359</b>	<b>269</b>	<b>26,052</b>
Provisions for management of spent fuel	11,322	(97)	505	89	11,819
Provisions for long-term management of radioactive waste	13,300	(101)	854	180	14,233
<b>Total provisions for nuclear dismantling and last cores</b>	<b>20,200</b>	<b>76</b>	<b>732</b>	<b>(618)</b>	<b>20,390</b>
Provisions for dismantling power stations	17,489	76	649	(484)	17,730
Provisions for last cores	2,711	-	83	(134)	2,660
<b>TOTAL FRANCE NUCLEAR PROVISIONS</b>	<b>44,822</b>	<b>(122)</b>	<b>2,091</b>	<b>(349)</b>	<b>46,442</b>

NB: Regarding the allocation to Dedicated Assets for nuclear provisions coverage, please refer to the slide "[Dedicated Assets](#)" on p.234

(1) Other changes include changes in asset-backed provisions. These changes are not included in the income statement.

# FRANCE NUCLEAR PROVISIONS

In millions of euros



(1) See note 15.1.1.1 of the consolidated financial statements at 31 December 2021

(2) Effects of a change in net discount rate for France:

- for provisions with no related assets: impact on P&L
- for provisions with related assets (matching assets and underlying assets): impact on balance sheet

(3) See note 1.4.1 2021 of the consolidated financial statements at 31 December 2021



# FRANCE NUCLEAR PROVISIONS: 2015-2021 CHANGES

	2015	2016	2017	2018	2019	2020	2021
Decommis- sioning costs plants in operation	Conclusions of the external audit commissioned by the DGEC on the cost of dismantling published in January 2016 <sup>(1)</sup> , stating that the overall audit confirms EDF's estimate of the cost of decommissioning its nuclear fleet  Three-year review of the cost assessment for dismantling first-generation plants to incorporate lessons learned from current sites.	Extensive revision of the cost estimate for the decommissioning of the plants in operation, taking into account the DGEC audit recommendations  Limited changes of the cost estimate and related provisions: -€0.5bn <sup>(2)</sup>	Having thoroughly revised the estimate, EDF continues to undertake an international comparison to back up its analyses taking care to identify and characterize a number of factors that could distort direct comparisons. These include differences in the scope of the estimates or in the national (for example in France, this includes the number of plants) and regulatory contexts.  Since its revision, the estimate has been subject to an annual review which, in 2017, 2018, 2019 and 2020 resulted in not-material adjustments				Update of the revision on the reference 900MW nuclear fleet, in order to take into account the pre-project studies led for the preparation of the decommissioning of Fessenheim, and the feedback of the beginning of its pre-decommissioning phase.  The extrapolation of these items to the entire PWR fleet has a limited impact on the provisions.
Decommis- sioning costs closed plants	Update to the industrial dismantling scenario for GCR reactors <sup>(3)</sup> : <ul style="list-style-type: none"><li>✓ Dismantling of the caissons (reactor buildings) in the open air, and no longer under water</li><li>✓ Lessons learned from dismantling a first caisson before commencing operations on the five others</li></ul> Provisions increased by €0.3 billion	Update of the evaluation of the decommissioning costs of the 1st generation plants  These annual studies confirm the changes previously made and do not lead to a significant change in the provisions.	<b>GCR <sup>(3)</sup>: Annual estimate review → non-material adjustments</b>				
			Independent expert review required by the French nuclear safety authority (ASN). EDF's main choices were ratified  Hearing by the ASN college in June  Strategy dossier, DOS <sup>(5)</sup> on the secure configuration and detailed 2017-2032 schedule sent at the end of December	The ASN sent its main questions and conclusions on the UNGG strategy dossier. Dismantling in the air, advantage of industrial demonstrator and the schedule for the first dismantled reactor (Chinon A2) seem to be approved.  Discussions continue on the schedule for dismantling the five other reactors.	GCR: Annual estimate review → non-ASN draft decisions submitted for public consultation from July to November 2019.  The ASN recognises the complexity of the operations to be carried out and the merits of the EDF risk control strategy. It calls for a slight acceleration of the work on the five reactors following the first series.  Taking into account the decision projects → + € 108M in the IA decommissioning provisions.material adjustments	ASN decisions published on 17 March 2020, without affecting the principles set out in the draft decisions for 2019.  External audit launched in December 2020 at the request of the French Department for Energy and Climate ( <i>Direction générale de l'énergie et du climat</i> [DGEC]) to assess the decommissioning of shut down EDF nuclear facilities. The audit should be complete in July 2021.  Health crisis impact on decommissioning provisions for approximately €45m	Finalisation in July of the external audit at the request of the French Department for Energy and Climate to assess the decommissioning of shut down EDF nuclear facilities. The report, posted online on the site of the French Ecological Transition Ministry in November 2021, considers the process of costing and annual review as robust, and confirms the adequate sizing of charges and provisions on the scope of the audit.
Cost of the Cigéo project	Cost of the Cigéo project set at €25bn <sup>(4)</sup> by the Ministerial Order <sup>(1)</sup> , which substitutes the 2005 estimated benchmark cost of €20.8bn on which EDF group used to rely.  €0.8bn increase in provision	Continuation of the design studies (ANDRA)		Continued design studies (ANDRA)  On 15 <sup>th</sup> January 2018, the ASN gave its recommendation on the Cigéo DOS: satisfactory technological maturity, request for a study on an alternative for storing bituminous waste  September 2018: expert group engaged by the French Directorate General of Energy and Climate (DGEC) to draw up an inventory of how bitumen is managed  Application dossier to build the facility by 2019 (for a permit in 2022)	Continuation of design studies (ANDRA).  The group of experts mandated in September 2018 concluded in September 2019 on the a priori feasibility of the various bitumen management options but stresses the importance of continuing the studies undertaken to identify the most appropriate option.  ANDRA planning → request for the creation of CIGEO in 2020, industrial pilot phase by 2030, reception of the first waste packages maintained for 2031.	Continued design studies (ANDRA).  French Finance Act for 2021 (the Finance Act) provides for a change in project taxation (transition from common law taxation to a storage tax). The French government still needs to clarify and administer the related legal provisions.  ANDRA planning→ request for the creation of CIGEO in 2021, intake of first waste packages maintained for 2031.	Continuation of design studies (ANDRA).  Holding in 2021 of the public inquiry associated with the request for a declaration of public utility (DUP). At the end of December, the investigating commissioners gave an unqualified favorable opinion on the public utility of the project.  The French government still needs to clarify and administer legal provisions linked to the change in project taxation (French Finance Act for 2021)  ANDRA planning → request for the creation of CIGEO in 2022, intake of first waste packages maintained for 2031

(1) Please refer to the release from the French Ministry for Ecology, Sustainable Development and Energy from 15 January 2016

(2) Lower provision for counterparty of underlying assets

(3) GCR: Gas-cooled reactor

(4) At the economic conditions of 2011

(5) Safety Operations Record « Dossier sur les Opérations de Sûreté »

# DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (1/5)

	December 2020	December 2021
Regulatory ceiling rate – real	2.7% <sup>(1)</sup>	2.8%
Nominal discount rate	3.3%	3.7%
Real discount rate	2.1%	2.0%
Inflation	1.2%	1.7%

The real discount rate, calculated according to the calculation methods applied since end-2020, is 2.0% on 31 December 2021 given the market data at this date, with an inflation assumption of 1.7%

The real discount rate is 10 bps down compared to end-2020

(1) 2.66% rounded to 2.7%

# DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (2/5)

## REGULATORY CEILING

- The **discount rate** for nuclear provisions in France must respect a **regulatory ceiling** calculated using a formula determined by ministerial order in accordance with the French Environmental Code (Art. D594-4)
- A **new regulatory ceiling**, applying from second-half 2020, has been determined by the ministerial order of 1 July 2020 (Art. 3)
- The **formula for the current regulatory ceiling** is expressed as a real value (including inflation) and equal, after a four-year transition period starting from end-2020, to the representative value of expectations of the real long-term interest rate (selected for the calculation published by the European Insurance and Occupational Pensions Authority (EIOPA) of the ultimate forward rate (UFR)) applicable on the date in question and increased by 150 basis points
- The application of the formula at 31/12/2021 gives a **regulatory ceiling for the discount rate of 2.8% in real value**

# DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (3/5)

## EVOLUTION IN DISCOUNT RATE CALCULATION METHODS

— The discount rate is now established on the basis of an interest-rate curve. This curve includes:

- a sovereign yield rate, based on market data at the end of trading for liquid time frames (0 to 20-year OAT rate curve) and subsequently converging, by using an interpolation curve, towards the ultimate forward rate (UFR) <sup>(1)</sup>;
- to which is added a spread curve for A to BBB-rated corporate bonds.

On the basis of the disbursement cash flows expected for nuclear engagements, an equivalent single discount rate is deducted from the rate curve thus constructed.

- The inflation rate assumption is established on the basis of an inflation rate curve, built using inflation-linked market products and taking account of economic forecasts, and consistent in the long term with the inflation rate assumption underlying the UFR (2%).
- This discount rate calculation method led, at 31 December 2021, to a nominal discount rate of 3.7% combined to an inflation rate of 1.7% (respectively 3.3% and 1.2% at 31/12/2020), so real rate 10 down to 2.0%
- The 10bp decrease compared with end-2020 had no impact on net debt (excluding the tax effect) as no indebtedness was related to a provision requirement thanks to a coverage ratio of over 100% (cash effect will be favourable for around €244m)
- The impact of this decrease on adjusted economic debt (AED), excluding the tax effect, corresponds to the increase in provisions, or €1,112m (or a net effect on the AED of €868m including the tax effect)

(1) The UFR was determined by the EIOPA for extremely long-term insurance liabilities comprising disbursements beyond market time frames. It is selected in the calculation methodology consistent with the decision of the administrative authority, which, in its order of 1 July 2020 amending the order of 21 March 2007 on the securing of financing for nuclear expenses, changed the formula for the regulatory ceiling of the discount rate, henceforth taking the UFR as a reference rather than the arithmetic average of the last 48 months of the TEC 30, the reference to the UFR being considered as more relevant for nuclear provisions given the extremely long-term maturities.

# DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (4/5)

## SENSITIVITIES AT 31/12/2021

- All other things being equal, depending on discount rate and inflation rate assumptions, **the sensitivity <sup>(1)</sup> to a 0.1% decrease in the real discount rate (excluding the corresponding tax effect) would be:**
  - For balance sheet provisions: €1,073m <sup>(2)</sup> (of which €963m for provisions covered by dedicated assets)
  - For income before tax: €(611)m
- This increase in nuclear provisions, and in particular those to be covered by dedicated assets, **does not imply a direct transposition of this effect to the Group's net debt** on the dates under consideration, as the amount to be allocated to dedicated assets in respect of each financial year varies, notably according to (given the order of 1 July 2020):
  - the profitability of the dedicated assets and the resulting coverage rate <sup>(3)</sup>
  - of the period within which the allocation is made, with regulation allowing ministers to determine a maximum period of five years for making the allocation

(1) As published in the consolidated financial statements at 31 December 2021

(2) Including €462M recorded against assets

(3) No need to allocate once the coverage rate reaches 100%

# DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE: SENSITIVITY ANALYSIS OF THE DISCOUNT RATE BASED ON PROVISIONS AT 31/12/2021 (5/5)

		Sensitivity to the discount rate				
<i>For a variation of 10 base points</i>		Provisions (discounted value)	On balance sheet provisions		On pre-tax earnings	
In millions of euros			+0.10 %	-0.10 %	+0.10 %	-0.10 %
Back-end nuclear						
Management of nuclear fuel	11,819	(120)	124	102	(107)	
Long-term management of radioactive waste	14,233	(472)	504	385	(413)	
Dismantling and last cores						
For decommissioning permanently shut-down nuclear plants	12,680	(291)	299	-	-	
For decommissioning nuclear plants in operation	5,050	(88)	91	88	(91)	
Last cores	2,660	(54)	55	-	-	
Total	46,442	(1,025)	1,073	575	(611)	
<i>o/w part of the coverage base for dedicated assets</i>	34,276	(917)	963	515	(548)	

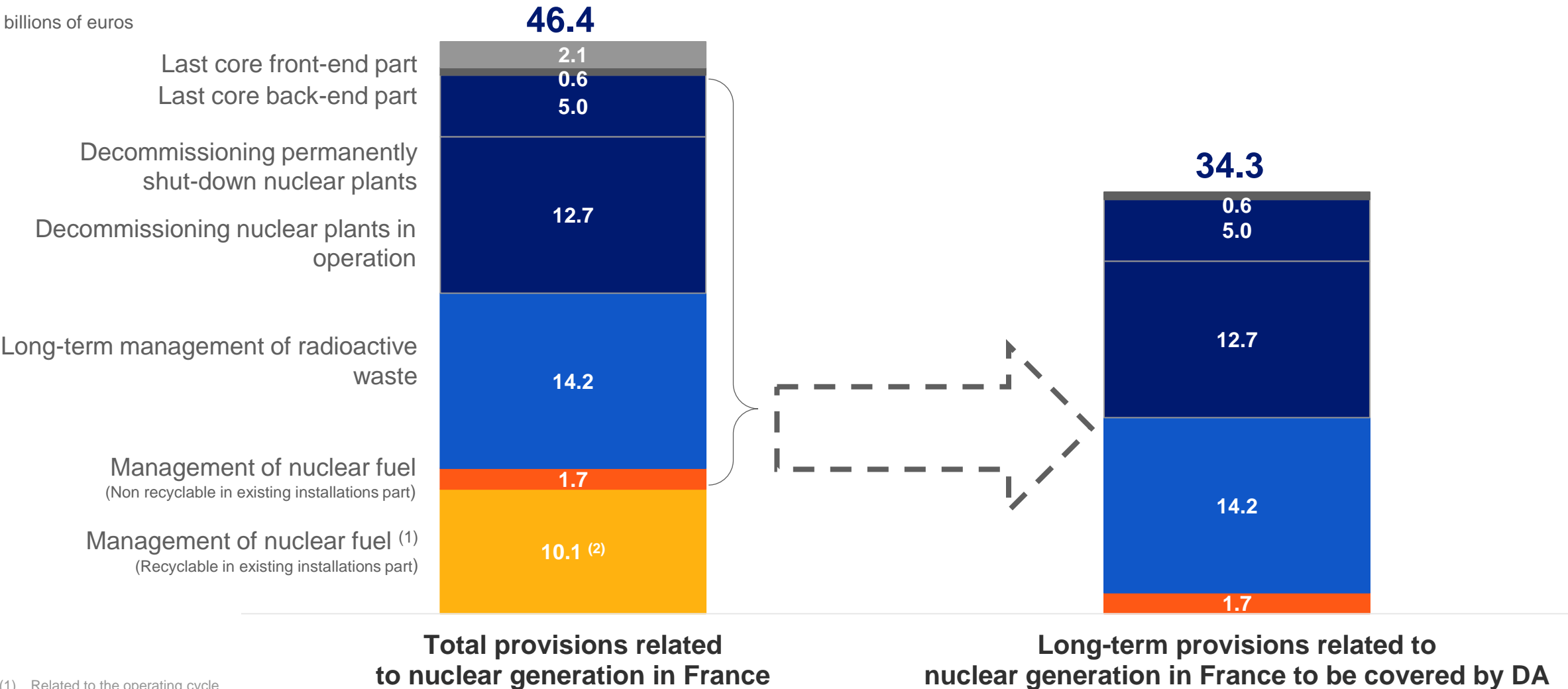
(1) Reclassified as long-term radioactive waste management at 31/12/2020 to ensure consistency with the latest nomenclature (breaking down nuclear charges into defined operations) as annexed to the amended decree of 21 March 2007 on securing the financing of nuclear expenses.



# PROVISIONS RELATED TO NUCLEAR GENERATION IN FRANCE

## PART TO BE COVERED BY DEDICATED ASSETS

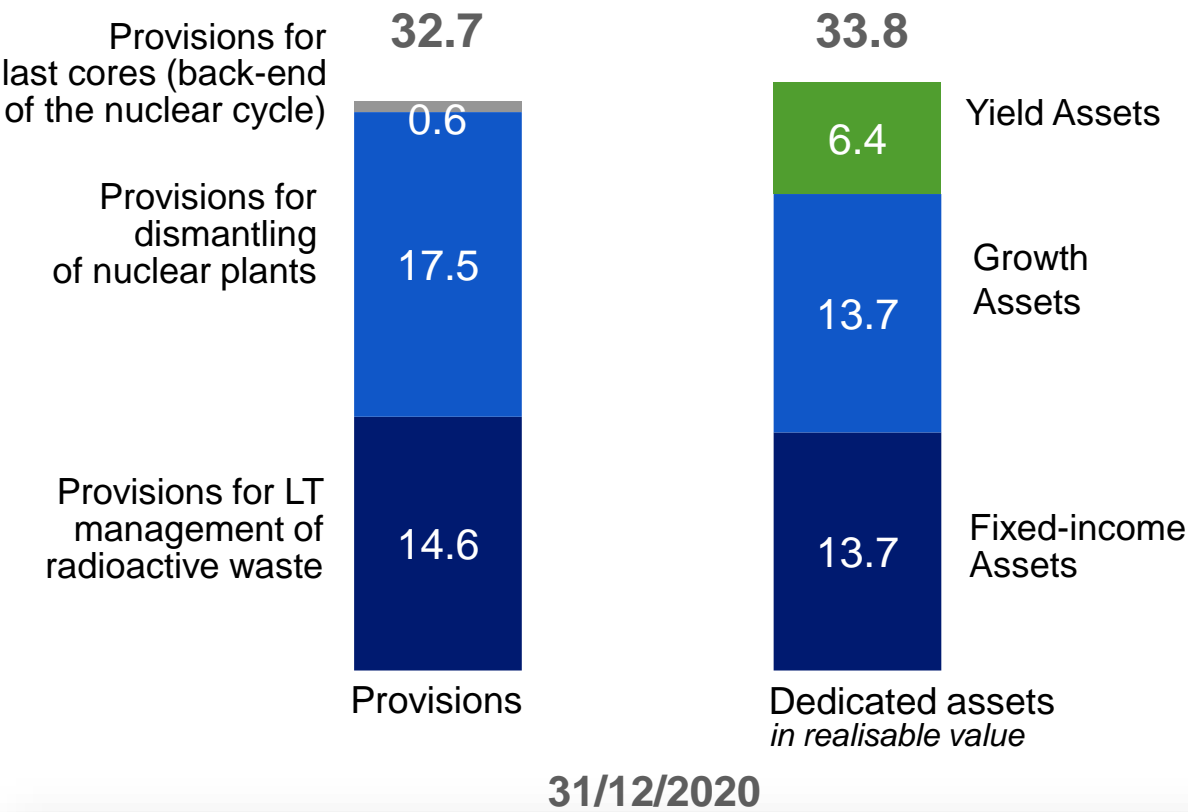
In billions of euros



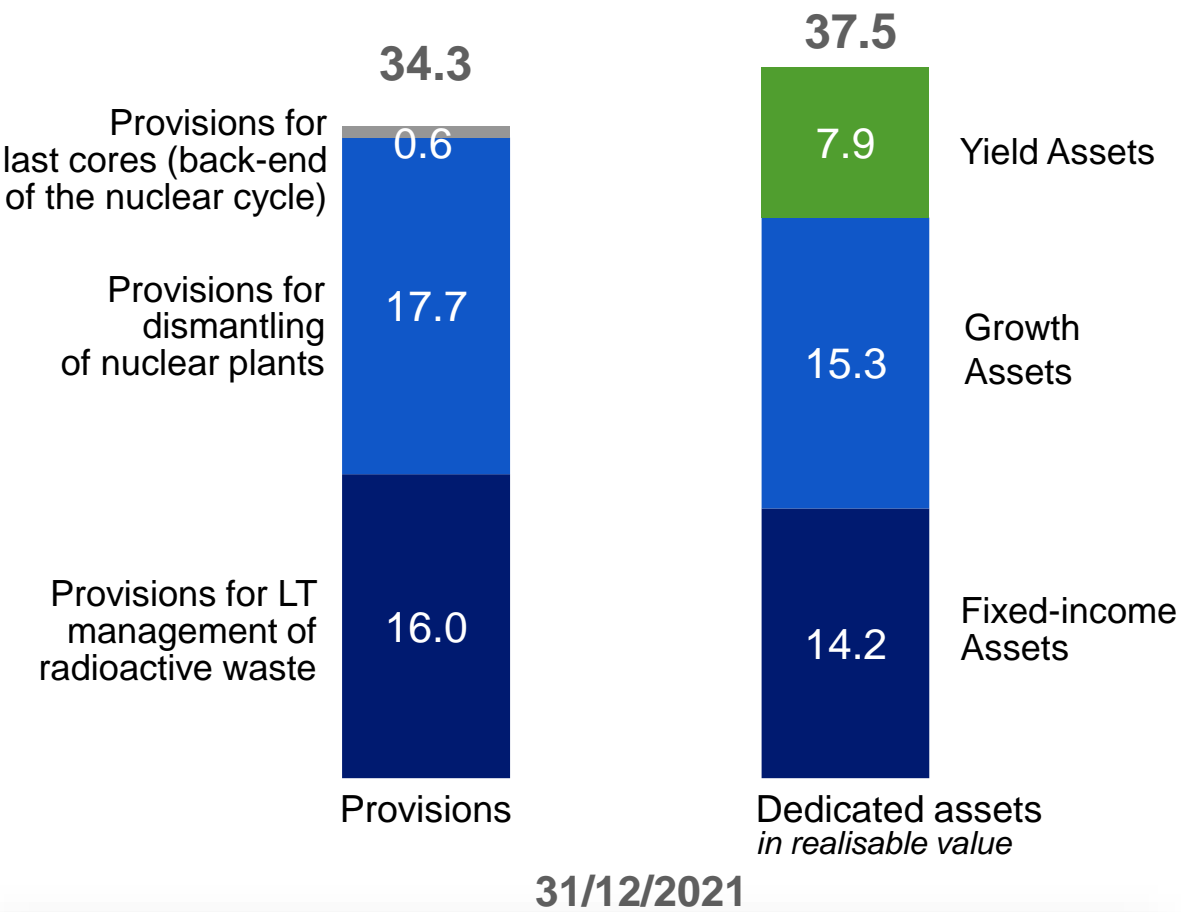
(1) Related to the operating cycle  
 (2) Of which €1.1bn Management of nuclear fuel, excluding law

# EDF SA DEDICATED ASSETS

In billions of euros



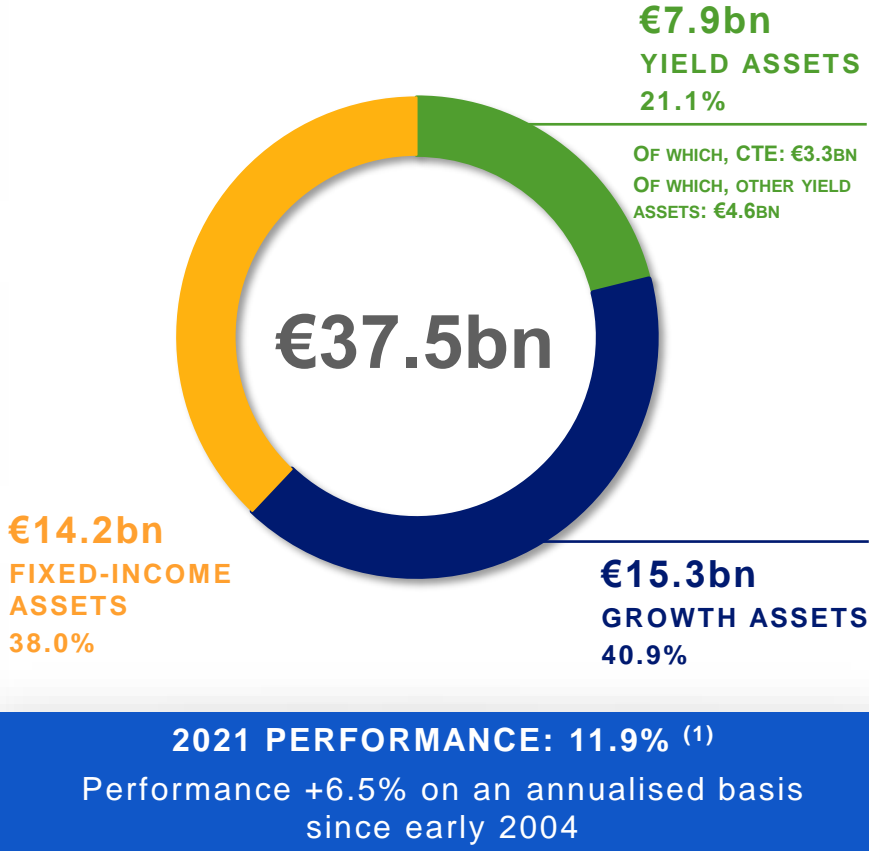
At 31 December 2020, the regulatory degree of coverage is 103.6%



- At 31 December 2021, the regulatory degree of coverage is 109.3%
- No allocation to DAs to be made in 2022 in respect of 2021 owing to a coverage rate of over 100%, in accordance with the regulation applicable since 1 July 2020

# PERFORMANCE OF EDF SA DEDICATED ASSETS (1)

YIELD ASSETS: +17.1%	Yield assets comprise <b>property</b> and <b>infrastructure assets</b> . In 2021, they generated a performance of 17.1%, composed of <b>dividends received</b> and the change in the realisable value of investments during the year. This solid performance resulted from <b>effective sector and geographical diversification</b>
GROWTH ASSETS: +22.6%	As a result of the equity market rise, the growth-asset component gained 22.6%, driven primarily by <b>investments in developed countries</b> . Volatility was contained through diversification.
FIXED-INCOME ASSETS: -0.7%	Fixed-income assets posted a -0.7% performance in 2021 despite the rise in interest rates, mainly because rates on <b>government loans remained at exceptionally low levels</b> . In addition, the <b>strong performance of credit markets</b> , the <b>selection</b> and <b>reduced sensitivity</b> of the portfolio served to <b>limit the decline</b> in value. Some components, including subordinated bank bonds and the <i>High-Yield</i> credit, turned in a largely positive performance.



(1) Pre-tax, non-annualised performance

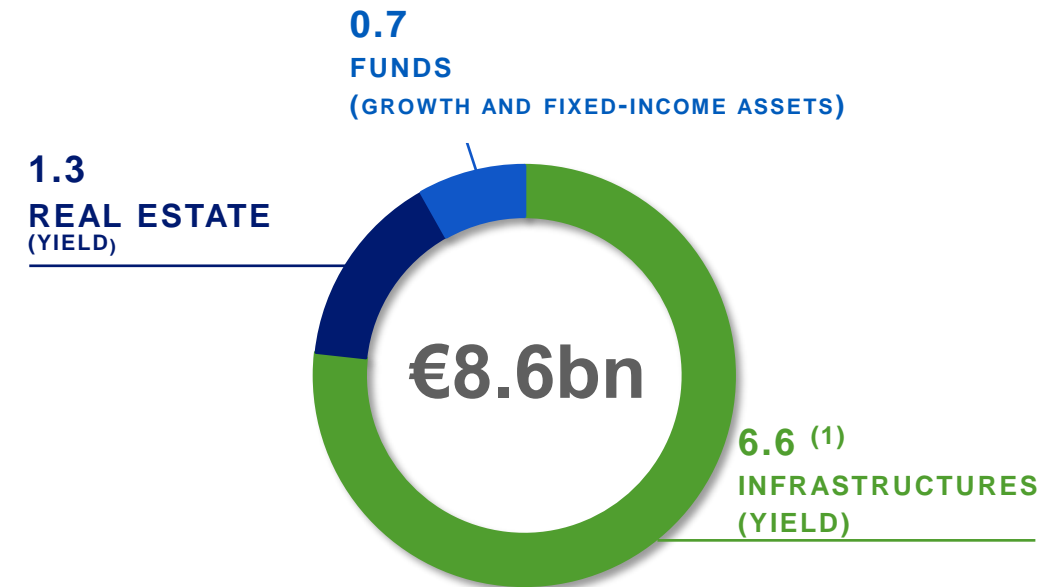
A new strategic allocation was defined in 2018 to improve the adequacy of the profile of dedicated assets to the long-term nature of the disbursements to be covered (Growth assets: 40%, Fixed-income assets: 30%, Yield assets: 30%).  
The targets of the new allocation will be met progressively, as investments are made, entailing a gradual rebalancing from fixed-income assets to yield assets

# EDF INVEST, THE INVESTMENT PLATFORM FOR NON-LISTED ASSETS

- EDF Invest is **the unlisted investment arm of EDF's Dedicated Assets** ; this portfolio amounts to **€8.6bn at 31 December 2021**
- The contribution of unlisted assets is the key to improve the Dedicated Assets return / risk profile and the perspective of long-term management is consistent the liabilities to be covered
- Among Dedicated Assets, unlisted assets contribute to yield assets, growth assets and fixed-income assets, invested in underlying Infrastructure, Real Estate and other Funds portfolios

- EDF Invest **aims at raising the amount of the non-listed assets** portfolio up to the **reference target fixed in the Strategic allocation defined in June 2018**
- In 2021, EDF Invest:
  - diversified its telecoms portfolio in France in fibre optic
  - supplemented its investment in the UK in smart meters
  - made further real estate investments in France and Germany

In billions of euros



# FINANCE

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# PUBLIC SERVICE COSTS (1/3): STABLE MECHANISM FOR COMPENSATING PUBLIC SERVICE COSTS AND TAXES SINCE 2016

- The 2015 amended French finance act and the 2016 French finance act introduced the principles of a new mechanism for compensating energy public service costs, effective as of 1 January 2016, with the following specific characteristics:
  - The State's budgeting of public service charges for energy (electricity and gas) is defined for 2022 on the basis of the CRE's (Commission for Energy Regulation) decision of 15 July 2021 and will be fully financed from 1 January 2021 by the "Energy Public Service" programme of the General Budget. The 2022 Initial Budget Act thus budgets the costs of the Public Service at €8,449m. A negative gap of €415m exists between the 2022 Initial Finance Act and the CRE deliberation of July 2021 on the "renewable energies support" item. It results from the readjustment made by the Budget Department consistent with the increase in market prices of electricity in September 2021.
- Repayment achieved at the end of 2020 of EDF's historical compensation deficit, in accordance with the Ministers' letter of 26 January 2016, enacted in the Decree of 18 February 2016 and the Orders of 13 May and 2 December 2016
- The TICFE (ex-CSPE, French contribution to electricity public service) tax has remained stable at €22.5/MWh since 2016 (full rate) and remained unchanged until 31/12/2021. As of 1<sup>st</sup> January 2022, the TDCFE (Departmental Tax) is abolished, which is accompanied simultaneously by an increase in the full rate of the TICFE with a departmental part. The TICFE thus stands at €25.83/MWh since 1 January 2022 for the full rate

# PUBLIC SERVICE COSTS (2/3) : CHARGES FOR EDF

Article L121-6 of the French Energy Code stipulates that the charges attributable to the public service tasks assigned to the electricity operators are fully compensated by the State

In millions of euros	2019		2020		2021	
Purchase obligation <sup>(1)</sup>	5,699	74%	6,158	76%	3,342	61 %
Other <sup>(2)</sup>	1,963	26%	1,923	24%	2,130	39 %
<b>Total EDF CSPE</b>	<b>7,662</b>	<b>100%</b>	<b>8,081</b>	<b>100%</b>	<b>5,472</b>	<b>100%</b>

The trend in public service charges between 2020 and 2021 can be attributed to two opposing factors:

- Charges on the purchasing requirement in metropolitan France fell €2,816m between 2020 and 2021 owing to a -5.8TWh contraction in renewable energies volumes (mainly wind (-5.9TWh) and hydro (-0.2TWh)), despite the development of new renewables energies power installed in 2021. Production under the purchasing requirement totalled 56.9TWh in 2021. The decline in volumes was accompanied by a sharp increase in electricity spot prices of €77/MWh between 2020 (€32/MWh) and 2021 (€109/MWh). As with the volume effect, this increase reduced charges by tightening the spread between the purchase obligation price and the market valuation.
- ZNI <sup>(3)</sup> charges rose by €197m between 2020 and 2021 as a result of the increase in charges for additional electricity production costs to offset the shutdown of certain third-party producer plants and respond to the increase in electricity consumption, with the easing of the effects of the health crisis in 2021 compared with 2020.

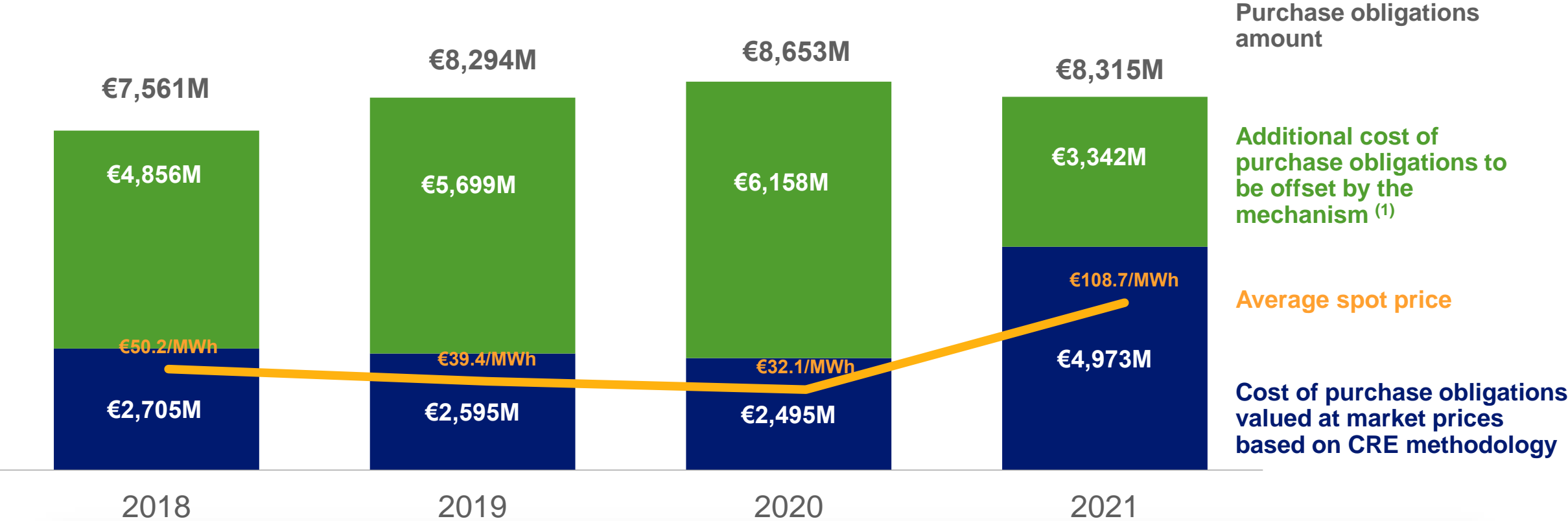
(1) Purchases obligations include electricity generated from: hydropower (less than 12MW), biomass, wind power, PV power, cogeneration, recovery of household waste and energy recovery, with the exception of ZNI <sup>(3)</sup>

(2) Additional generation costs and purchase obligations in ZNI<sup>(3)</sup>, the TPN (First Necessity Tariff) and the FSL (Housing Solidarity Fund), as well as charges relating to the sales shortfall of the Gas portfolio following the price freeze ruled on by the government starting on 1 November 2021.

(3) ZNI: *Zones non interconnectées* corresponding to overseas departments and Corsica and some of the Breton islands



# PUBLIC SERVICE COSTS (3/3): CHANGE IN PURCHASE OBLIGATIONS IN MAINLAND FRANCE FOR EDF



**Principle:** The compensation mechanism of public energy services <sup>(2)</sup> charges offsets the difference between the cost of purchase obligations in mainland France and market prices

(1) EDF SA excluding island activities  
 (2) The compensation mechanism of public energy services charges also covers the tariff equalization costs in the ZNI (Zones Non Interconnectées), and the solidarity programs.

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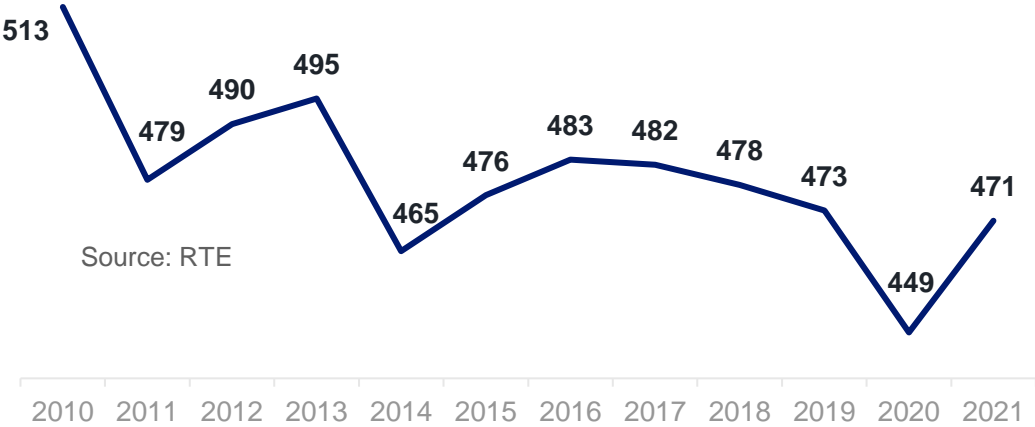
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# MARKETS: ELECTRICITY CONSUMPTION

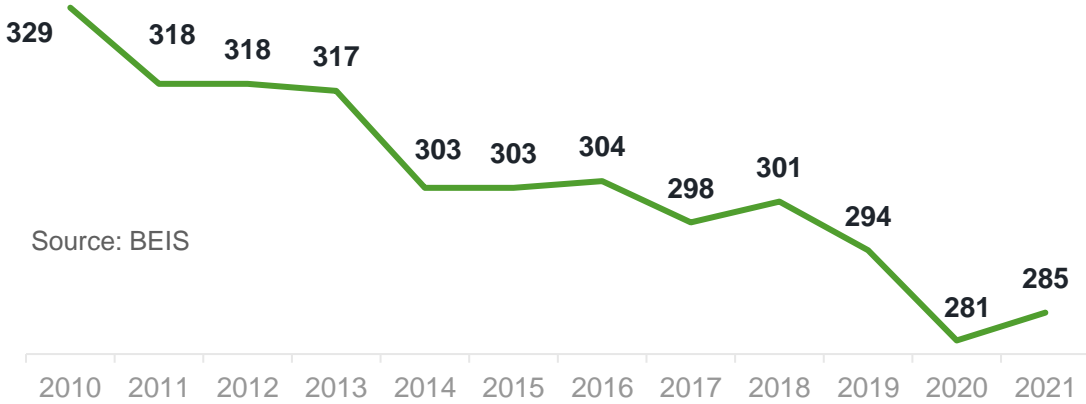
(DATA NOT ADJUSTED FOR WEATHER AND CALENDAR)

In TWh

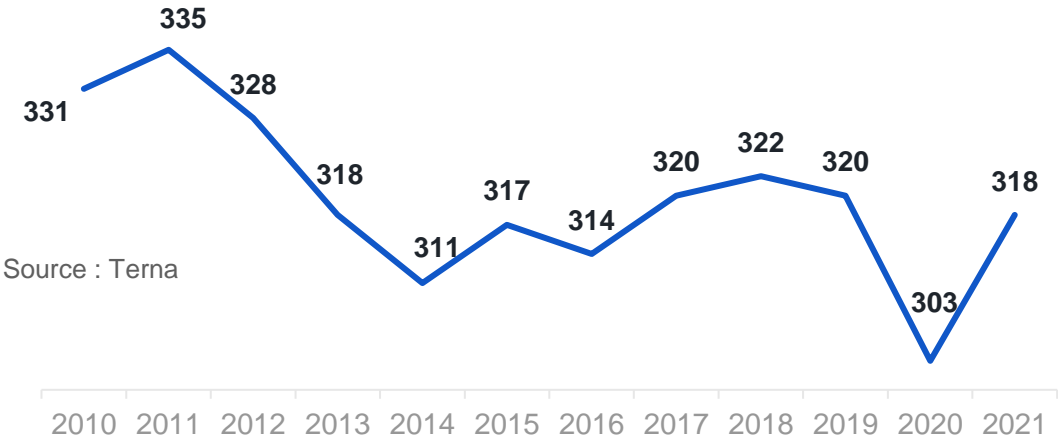
## France



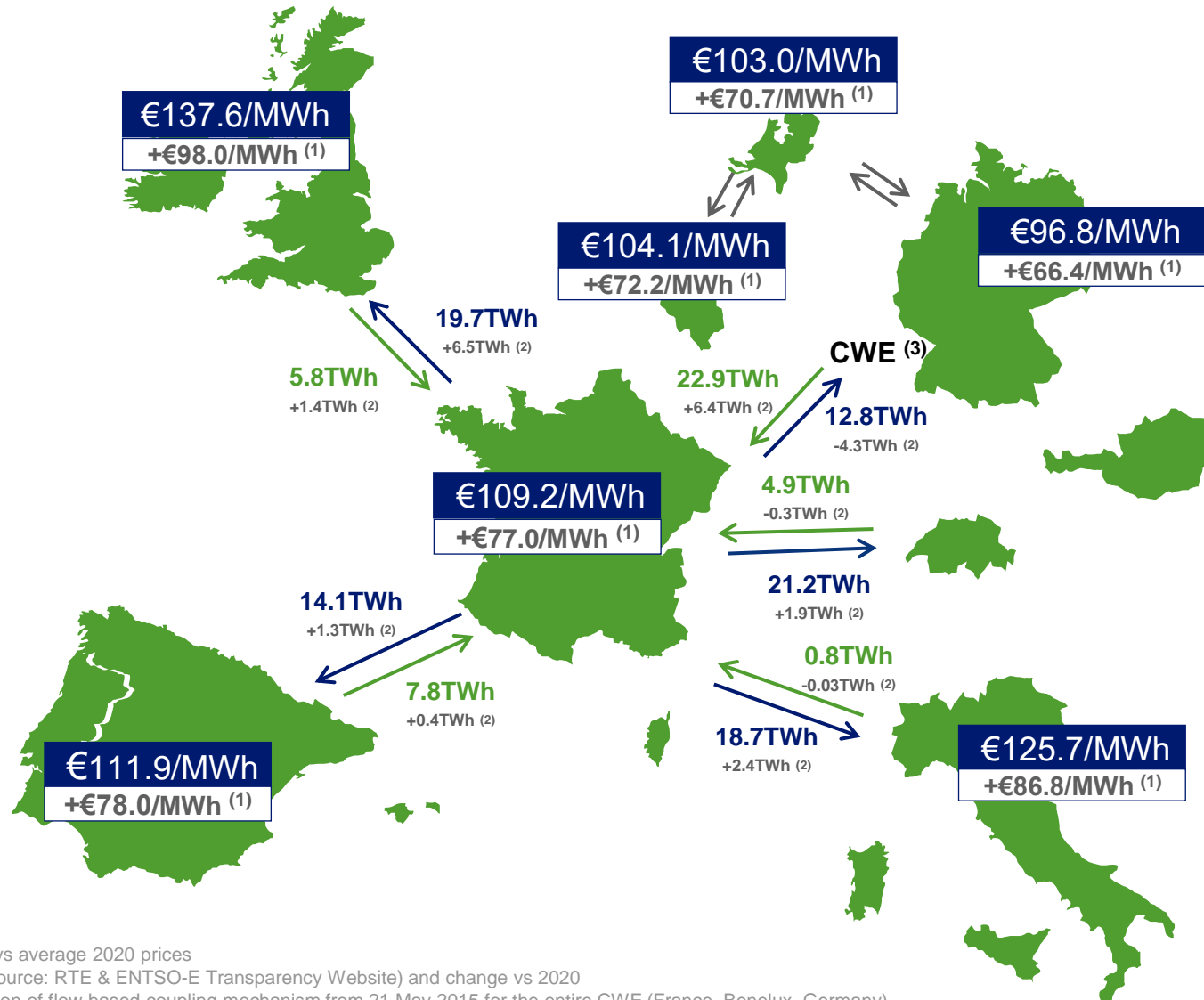
## The United Kingdom



## Italy



# AVERAGE SPOT PRICES IN 2020



The increase in prices set new records in 2021:

- A substantial **increase in the price of gas, coal and CO<sub>2</sub>**, leading to a significant rise in the production costs of fossil-fired power plants
- **Low wind-power generation** in Germany and France, favouring the use of thermal power plants (coal)
- **Higher demand** in 2021 stemming from the economic recovery after the lockdowns in Europe in 2020

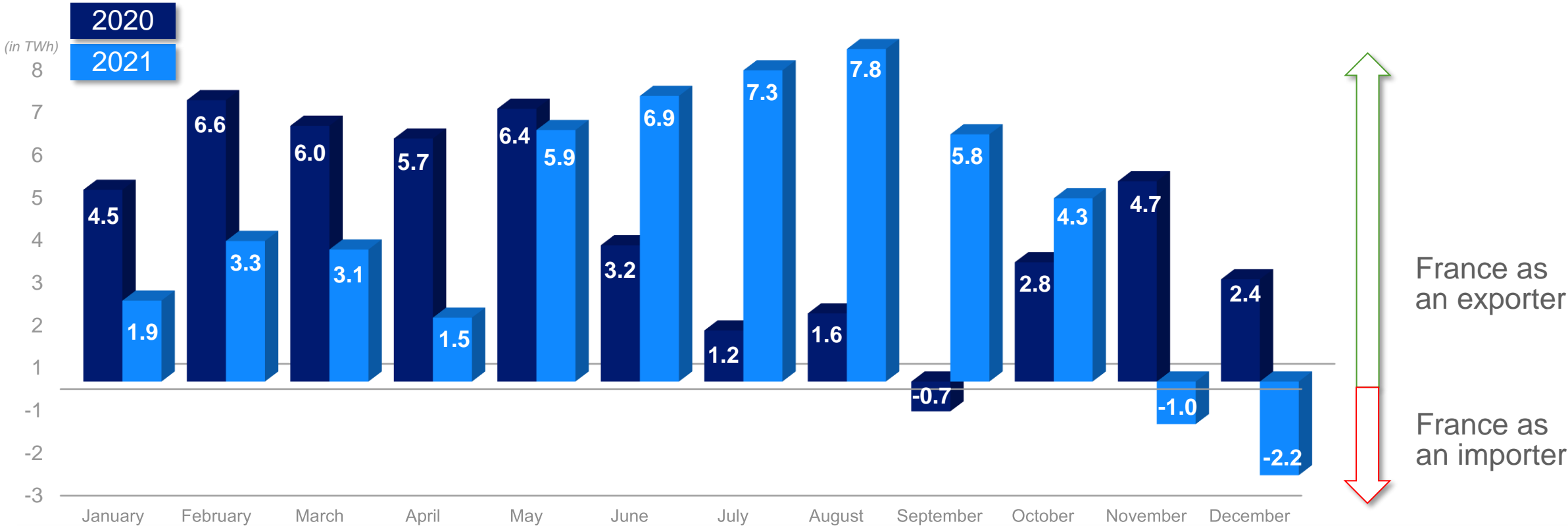
The coupling of markets has enabled a certain degree of price convergence, though still limited by available interconnection capacities at borders.

Average observed spot market price for 2021:

- EPEXSPOT: France & Germany
- N2EX: United-Kingdom
- OMIE: Spain
- GME: Italy (Prezzo Unico Nazionale)
- APX: Netherlands
- BELPEX: Belgium



# CROSS-BORDER ELECTRICITY TRADE BALANCE



France’s export balance for 2021 stood at 44.3TWh. Despite a rise in consumption, the high level of power generation kept this balance at the same level as last year. Exports were up by 7.9TWh to 86.5TWh. They were higher across all borders except in the CWE <sup>(1)</sup> zone, where they were down by 4.3TWh. Imports stood at 42.2TWh, up by 0.8TWh, with increases across all borders except from Italy (-0.03TWh) and Switzerland (-0.3TWh) where they registered a slight decrease.

Source : RTE until August 2020 et from September 2020 : ENTSO-E data  
(1) CWE flow-based coupling zone composed of Germany, Belgium, France, Luxembourg and Netherlands, set up in May 2015

# FRENCH POWER TRADE BALANCES AT ITS BORDERS

(in TWh <sup>(1)</sup>)

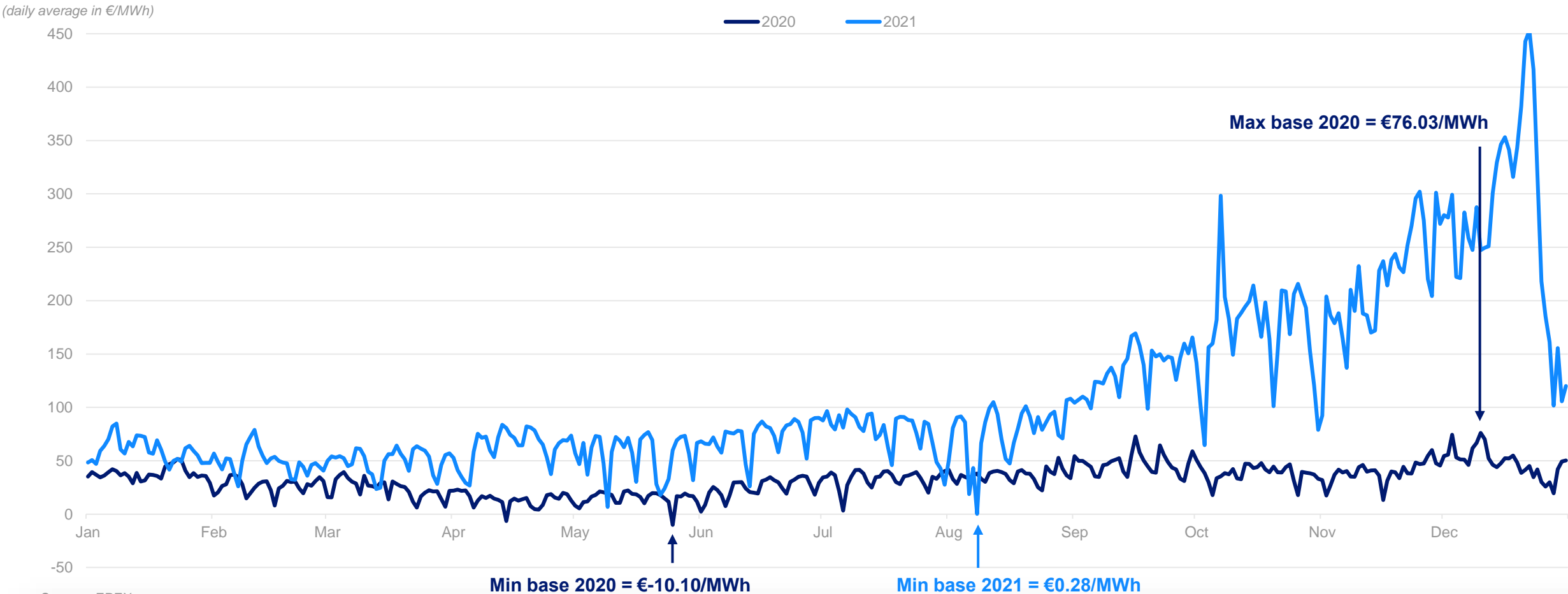
		2020					2021				
		Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
United Kingdom	exports	3.7	3.7	2.3	3.5	13.1	5.6	5.7	5.7	2.7	19.7
	imports	0.6	1.4	1.7	0.7	4.4	1.3	1.1	0.8	2.5	5.8
	balance	3.1	2.3	0.6	2.8	8.8	4.2	4.6	4.9	0.2	13.9
Spain	exports	4.0	4.0	2.2	2.6	12.8	2.6	4.4	5.2	1.8	14.1
	imports	1.0	1.0	2.5	2.8	7.4	3.0	1.4	0.5	2.9	7.8
	balance	3.0	3.0	-0.4	-0.2	5.4	-0.4	3.0	4.8	-1.1	6.3
Italy	exports	5.9	2.1	3.1	5.2	16.3	4.2	4.4	5.7	4.4	18.7
	imports	0.0	0.2	0.4	0.2	0.9	0.2	0.2	0.0	0.4	0.8
	balance	5.8	1.9	2.6	5.1	15.4	3.9	4.2	5.7	4.0	17.8
Switzerland	exports	6.4	4.7	2.5	5.7	19.3	5.4	4.8	5.3	5.7	21.2
	imports	0.8	1.0	2.1	1.3	5.2	1.1	1.5	1.3	1.0	4.9
	balance	5.6	3.7	0.4	4.4	14.1	4.3	3.3	4.1	4.7	16.3
CWE <sup>(2)</sup>	exports	4.3	6.7	3.0	3.1	17.1	3.1	4.0	4.2	1.5	12.8
	imports	4.7	2.3	4.1	5.4	16.5	6.9	5.0	2.8	8.3	22.9
	balance	-0.3	4.4	-1.1	-2.3	0.6	-3.7	-0.9	1.4	-6.8	-10.1
TOTAL	exports	24.3	21.2	13.0	20.1	78.6	20.9	23.3	26.2	16.1	86.5
	imports	7.1	6.0	10.9	10.3	34.3	12.5	9.2	5.4	15.1	42.2
	balance	17.2	15.3	2.1	9.7	44.3	8.3	14.1	20.8	1.0	44.3

Source: RTE

(1) Rounded to the nearest tenth

(2) CWE flow-based coupling zone composed of Germany, Belgium, France, Luxembourg and Netherlands, set up in May 2015

# FRANCE: BASELOAD ELECTRICITY SPOT PRICES

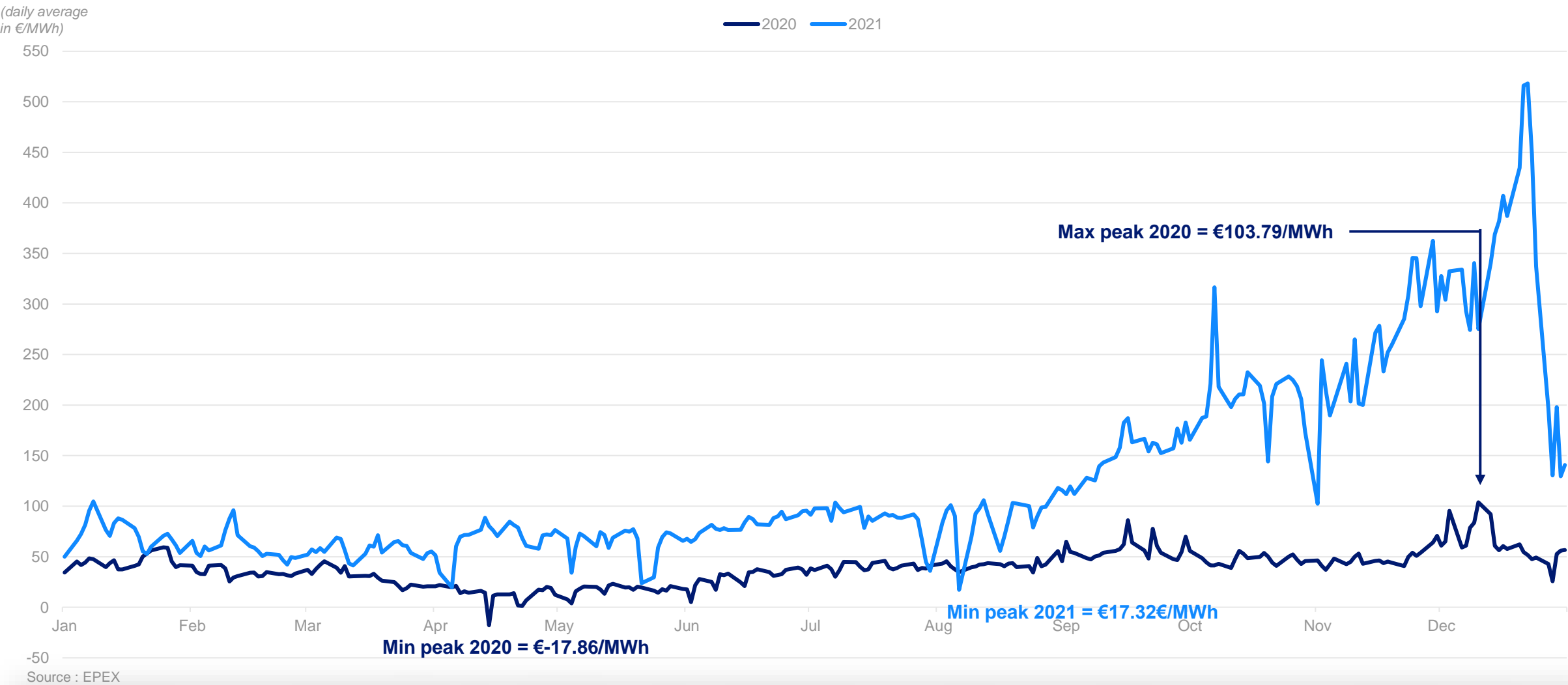


Source : EPEX

In France, baseload electricity spot prices averaged €109.2/MWh in 2021, up €77.0/MWh compared with 2020. The sizeable increase resulted from a combination of three factors: a sharp rise in commodities prices in Q3 and Q4 2021, triggering a substantial increase in the cost of producing electricity from fossil fuel-fired power plants; a recovery in consumption (+21.6TWh vs. 2020) especially in Q2 and Q4 2021; and a decline in renewables generation in 2021 compared with 2020 (-3.8%, or -1.9TWh). Greater use was made of fossil-fired generation resources in Q4 2021, particularly coal, the production of which increased 204% relative to Q4 2020.

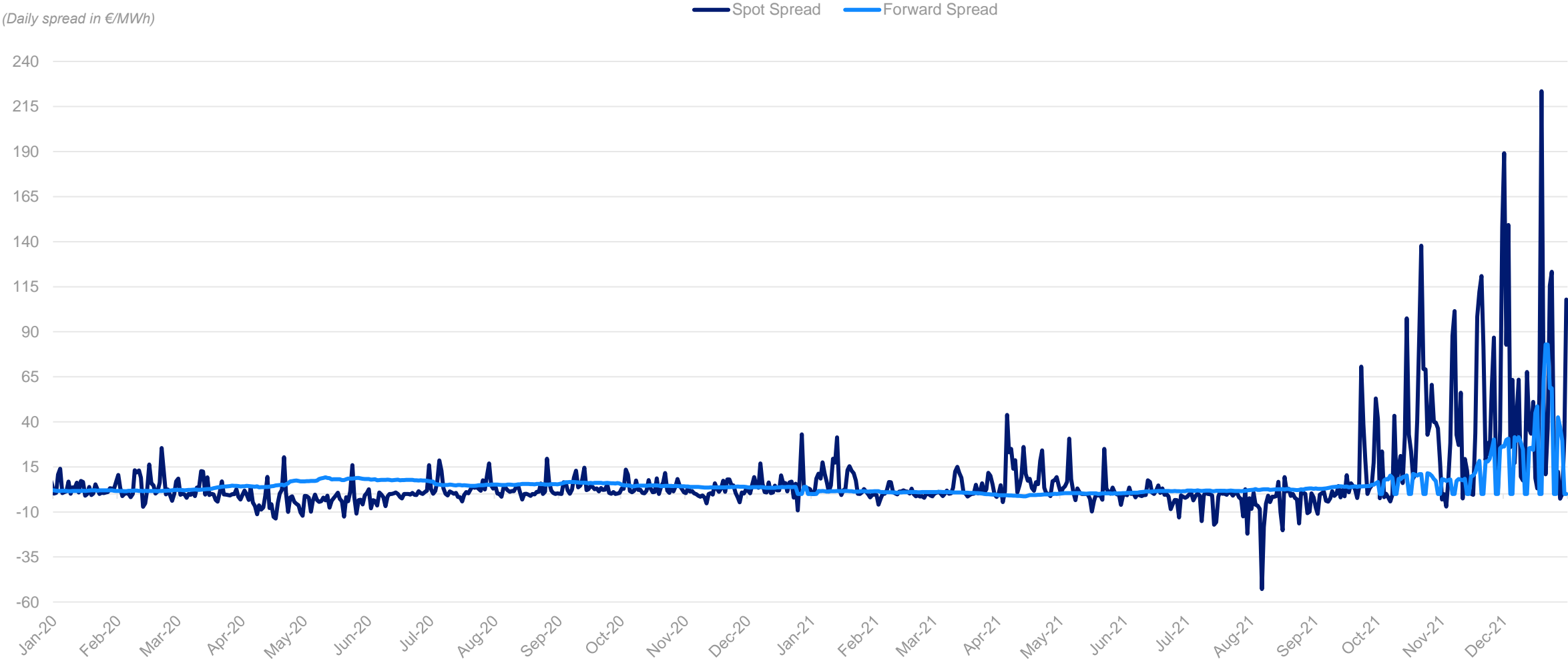


# FRANCE: PEAKLOAD ELECTRICITY SPOT PRICES



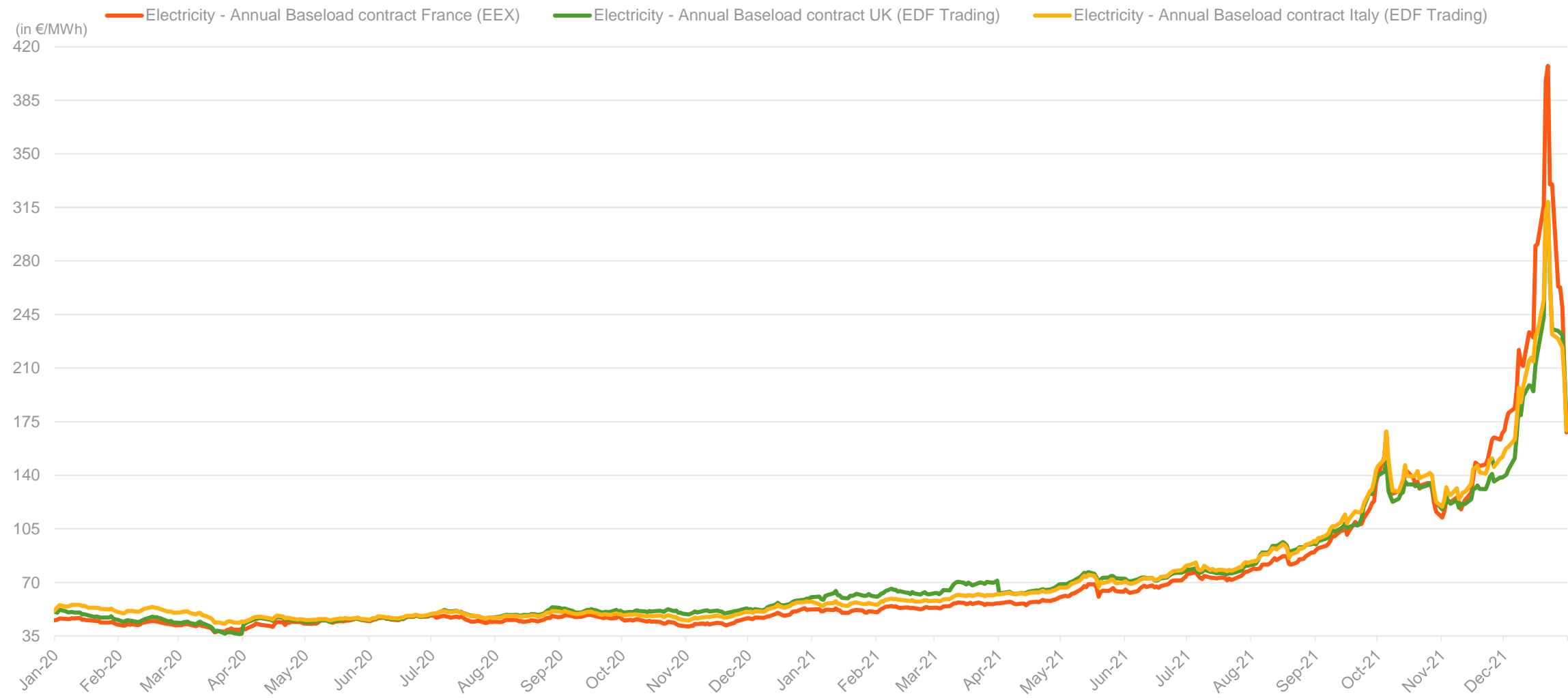
Peakload electricity spot prices averaged €127.4/MWh in 2021 (+€88.4/MWh vs. 2020). As with baseload prices, the substantial increase resulted from the rise in demand combined with the sharp increase in commodities prices (gas, coal and CO<sub>2</sub>) and the greater use of fossil-fuel resources in 2021.

# FRANCE/GERMANY SPREAD FROM 01/01/2020 TO 31/12/2021

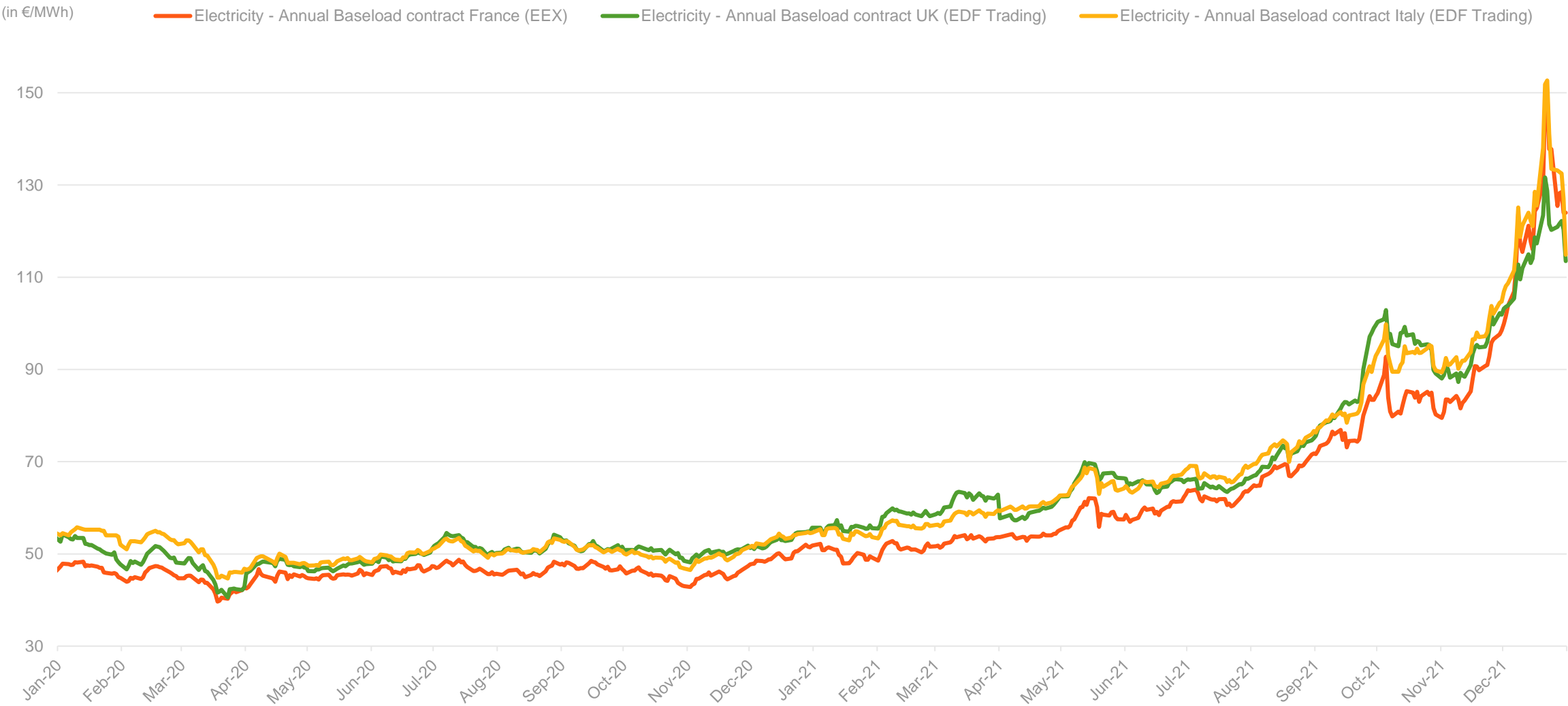


Note: Over the period, the France/Germany spread reached its minimum on 6 August 2021 at €-52.80/MWh, and its maximum on 19 December 2021 at €223.49/MWh

# FORWARD ELECTRICITY PRICES IN FRANCE, THE UK, ITALY AND GERMANY (Y+1) FROM 01/01/2020 TO 31/12/2021



# FORWARD ELECTRICITY PRICES IN FRANCE, THE UK, ITALY AND GERMANY (Y+2) FROM 01/01/2020 TO 31/12/2021



# COAL PRICES (Y+1) FROM 01/01/2020 TO 31/12/2021



Coal prices for next-year delivery in Europe rose by +63.2% compared to 2020. In China, imports and higher production were not enough to cope with the increase in demand. Then gas prices soared and coal-fired power plants became competitive in a long term perspective. In Europe, waves of cold weather drove countries to rebuild their coal stocks. Finally, some coal-producing countries (Colombia, Russia, South Africa, Australia, Indonesia) had production problems due to social contests and unfavourable weather conditions.

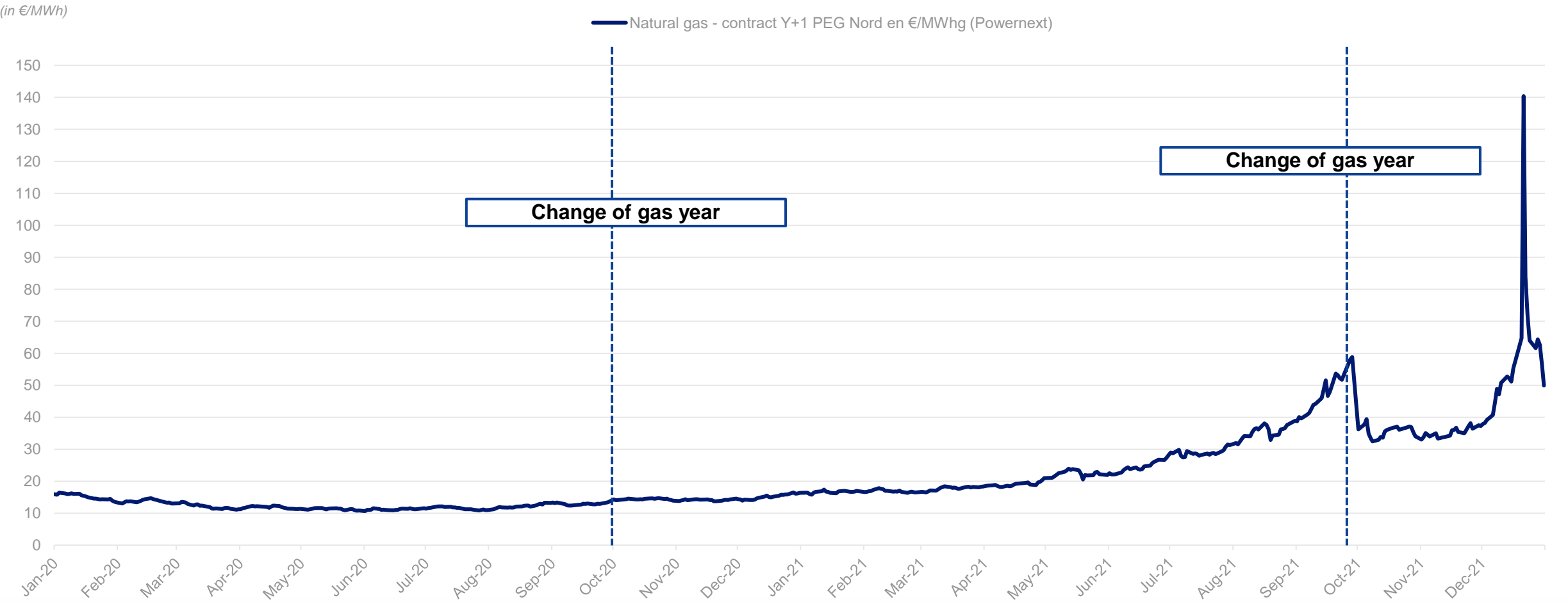
# BRENT PRICES <sup>(1)</sup> FROM 01/01/2020 TO 31/12/2021



Oil prices were up by +64.0% compared to 2020 as demand rose significantly all over the world, driven by the resumption of normal economic activity and introduction of recovery plans in the USA and Europe. The rise in oil prices was limited by the OPEP+ countries' adjustment of production to the IEA's <sup>(2)</sup> forecast worldwide demand.

<sup>(1)</sup> Brent spot price (M+1)  
<sup>(2)</sup> International Energy Agency

# GAS PRICES<sup>(1)</sup> (Y+1) FROM 01/01/2020 TO 31/12/2021



The **annual gas contract** price for next-year delivery in the PEG zone increased by +131.8%. Lower temperatures in the spring brought gas stocks down in Europe. In Asia, more extreme temperatures led to high gas consumption for heating and air conditioning. China imported more gas in a politically tense situation that drove it to halt imports of Australian coal. Uncertainties over gas supplies from Russia via Ukraine, or via NordStream 2, stoked tensions on the European market, and competition between European and Asian markets to attract LNG cargo ships also contributed to upward price trends. Finally, gas prices shot up in the early winter in response to announcements by the Russian president and geopolitical tensions in eastern Europe



# CO<sub>2</sub> MARKET



The price of emissions certificates for delivery in December Y+1 stood at an average €54.0/t in 2021 (+115.0% or +€28.9/t vs 2020). The CO<sub>2</sub> quota price followed a robust upward trend throughout the year 2021.

CO<sub>2</sub> emission quota prices began the year in a favourable political environment, after the announcement in January that the USA would rejoin the Paris Agreement. Then on 14 July the European Union presented its proposals to cut EU greenhouse gas emissions by 55% by 2030, rather than the initial 40% target. Late in the year, the German government's proposal to set a minimum carbon price reinforced the upward price trend.

As well as these developments, temperatures were lower than normal in April and greater use of fossil-fired power plants was necessary. From the third quarter onwards, gas prices soared among fears over the levels of European stocks, and this pushed up the output by coal-fired power plant.

Finally, prices fluctuated with “financial” speculative position-taking, which also contributed to higher volatility in CO<sub>2</sub> quotas.

Because the price of electricity is based on the marginal cost of production, it is sensitive to changes in the price of CO<sub>2</sub> that influence the cost of production of electricity using gas and coal. The sensitivity of the wholesale electricity price in France to the CO<sub>2</sub> price is around €0.5/MWh to €0.6/MWh for €1/tonne of CO<sub>2</sub>

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# FINANCIAL CALENDAR

4 May 2022



**Q1 2022 sales**

12 May 2022



**General Shareholder's meeting**

28 July 2022



**2022 half-year results**

# A TEAM DEDICATED TO ANALYSTS AND INVESTORS

To understand better the EDF group, you can also visit our web page **dedicated to investors and analysts**:  
<https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders>

...on which you can download our **Kit Investisseur** including:

- **The Analyst Pack**, with all the main financial and extra-financial data in an Excel format  
<https://www.edf.fr/en/the-edf-group/dedicated-sections/finance/investors-analysts/essential>
- **The Universal Registration Document**  
<https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/financial-information/regulated-information/reference-documents>
- All the data relative to our **annual results**  
<https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/financial-information/regulated-information/financial-results>

For more information, our team is available to you at this address: [EDF-IRTeam@edf.fr](mailto:EDF-IRTeam@edf.fr)



# GLOSSARY (1/6)

- **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
- **APE:** the French State Shareholding Agency is a national department controlled by the Minister of Economy and Finance. Its mission is to act as a shareholder for the French Government in order to develop its assets to maximise the value of its stakes
- **Architect-Assembler:** for EDF, the architect-assembler has control over the design and operation of its power plants; the organization of development projects; the schedule for completion and costs of construction; relations with the Nuclear Safety Authority; and the integration of feedback from operational experience. EDF's role as architect-assembler ensures control over its industrial policy with respect to the design, construction and operation of its fleet of power plants
- **ARENH:** Regulated Access to Historical Nuclear Energy
- **ASN (Autorité de Sûreté Nucléaire) :** the French Nuclear Safety Authority controls nuclear safety and radioprotection in France, on behalf of the French government, to protect workers, patients, the public and the environmental risks associated with the use of nuclear energy. It is notably in charge of the external control of nuclear facilities in France. The ASN is an independent administrative authority with a staff of more than 300. It is represented at the national level by the General Agency for Nuclear Safety and Radioprotection (or "DGSNR")
- **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%
- **Combined-Cycle Gas Turbine (CCGT):** 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

## GLOSSARY (2/6)

- **CRE (*Commission de Régulation de l'Énergie*):** French energy regulatory Commission. 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 the 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.
- **Distribution networks:** downstream of the transmission network, medium- and low-tension distribution networks that serve end-users (individuals, Groups, SMEs, SMLs, etc.)
- **Electricity supply:** can be broken down into four types of consumption: “basic” (or “ribbon”) supply of electricity generated and consumed throughout the year; “semi-basic” electricity supply, which is generated and consumed over the winter period; “peak” electricity supply, which corresponds to periods of the year when electricity generation or consumption is significant; and “lace” supply which is a complement to the “ribbon” supply
- **EPR (European Pressurized Reactor):** 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
- **ETS :** Emission Trading System
- **European Green taxonomy:** Commission delegated regulation (EU) 2021/2139 of 4 June 2021 supplementing regulation (EU) 2020/852 of the European Parliament and of the Council with the technical review criteria for determining under which conditions an economic activity can be considered to contribute substantially to climate change mitigation or adaptation and whether that economic activity does not cause significant harm to any of the other environmental objectives
- **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: 1) upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years); 2) 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); 3) 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

## GLOSSARY (3/6)

- **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: 1) upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years); 2) 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); 3) 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
- **Greenhouse gases:** 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<sub>2</sub>), methane (CH<sub>4</sub>), nitrogen protoxide (N<sub>2</sub>O), hydrofluorocarbons(HFC), perfluorated hydrocarbons (PFC), sulfurhexafluoride (SF<sub>6</sub>) and, since 2013, nitrogen trifluoride (NF<sub>3</sub>)
- **Hydrogen:** The conversion of natural gas into hydrogen generates CO<sub>2</sub> hence the qualification of “grey” hydrogen. This form of hydrogen is used on a large scale, particularly in the chemical industry to produce ammonia and fertilisers. So-called “blue” hydrogen is obtained when the emitted CO<sub>2</sub> is captured and then reused or stored. So-called “green” hydrogen is generated from renewable energy sources. The electricity generated by wind turbines or solar panels is transformed with water through an electrolysis process. No greenhouse gases are emitted. Hydrogen can be stored in large quantities and then converted back into electricity
- **Hydropower generation:** maximum power energy that can be produced from hydraulic sources in normal conditions. However, generation from hydroelectric facilities does vary, sometimes markedly, from one year to the next depending on hydraulicity (rainfall and snowfall). In dry year, the generation index may vary by 20% or more from the standard level
- **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 neighboring country
- **IRSN:** Institut de radioprotection et de sûreté nucléaire. IRSN is the public expert in research and assessment of nuclear and radiological risks
- **LDC:** Local Distribution Companies that provide for distribution of gas and electricity to the end-customers on a delimited geographical area
- **LNG (Liquefied Natural Gas):** natural gas turned into liquid form by reducing its temperature to –162°C allowing for a reduction by 600 in its volume
- **MEDEF:** French companies association (“*Mouvement des entreprises de France*”)



# GLOSSARY (4/6)

- **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)
- **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.  $1\text{MW} = 1,000 \text{ kilowatts} = 1 \text{ million watts}$   
 $1\text{MWh} = 1\text{MW produced for 1 hour} = 1 \text{ megawatt-hour}$   
 $1\text{GW} = 1,000\text{MW} = 1 \text{ billion watts}$   
 $1\text{TW} = 1,000\text{GW}$
- **Non-interconnected zones:** Zones in France which are not connected (by power lines) to metropolitan France (Corsica and overseas departments)
- **Nuclear safety:** nuclear safety includes all of the technical, organizational 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 life of a nuclear power plant (from design to operation and finally to decommissioning)
- **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
- **Ofgem:** Ofgem is the Office of the Gas and Electricity Markets in the UK. Its main missions consist of protecting consumers, regulating gas and electricity monopoly companies, helping to secure Britain's energy supplies by promoting and regulating competitive gas and electricity markets. It also contributes to the drive to curb climate change and promote sustainable development
- **Plant availability:** fraction of power available, out of theoretical maximum energy, counting only technical non-availability. 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 x 8,760h. The Kd, which includes only technical non-availability, i.e. scheduled shutdowns, unplanned outages and testing periods, characterizes a plant's industrial performance
- **PPA:** Price Purchase Agreement

## GLOSSARY (5/6)

- **PWR:** in a Pressurized Water Reactor, the primary coolant (water) is pumped under high pressure to the reactor core where it is heated by the energy generated by the fission of atoms. The heated water then flows to a steam generator where it transfers its thermal energy to a secondary system where steam is generated and flows to turbines which, in turn, spin an electric generator. In contrast to a boiling water reactor (BWR), pressure in the primary coolant loop prevents the water from boiling within the reactor
- **Radioprotection:** 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 ground players has allowed a continuous improvement of performance on the protection of employees against the effects of ionising radiation.
- **Renewable energies:** energies for which generation does not require extinction of the initial resource. They largely derive from geothermal, water, air, fire and solar sources. They include hydro, wind, solar (the energy produced by marine waves and currents), geothermal (energy derived from the heat of 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
- **Reprocessing:** reactor burnt fuel reprocessing aimed at separating materials that can be recycled (uranium and plutonium) from final waste
- **RTE:** RTE is the operator of the French electricity transmission system. RTE, a public service company, operates, maintains and develops the high and very high voltage network
- **Scope 1, 2 and 3:** Every year, EDF draws up a GHG report (scopes 1, 2 and 3) covering the Group scope calculated according to the principles of GHG Protocol Corporate Standard. Scope 1 covers the direct emissions generated by EDF’s assets: CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O 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<sub>6</sub> 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 centres, 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 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.)

# GLOSSARY (6/6)

- **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)
- **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, towardsthe 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 risks control
- **Storage center:** low or medium-level short-life radioactive waste from nuclear plants, the Hague or CENTRACO facilities are sent to ANDRA's Soulaïnes storage center in the Aube region, which has been operational since 1992. This center has a capacity of 1,000,000cm, and an acceptance capacity of approximately 60 years. Very low-level short-life radioactive waste is sent to ANDRA's Morvilliers storage center (also in the Aube region). This center was commissioned in October 2003 and has an operating life of about 30 years
- **Transmission networks:** networks 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)
- **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 naturallevel (0.7%) to approximately 4% for pressurised water reactor fuel.
- **Waste:** nowadays, 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-life waste represents more than 90% of the total waste, but contains only 0.1% of the total radioactivity of those 11g

