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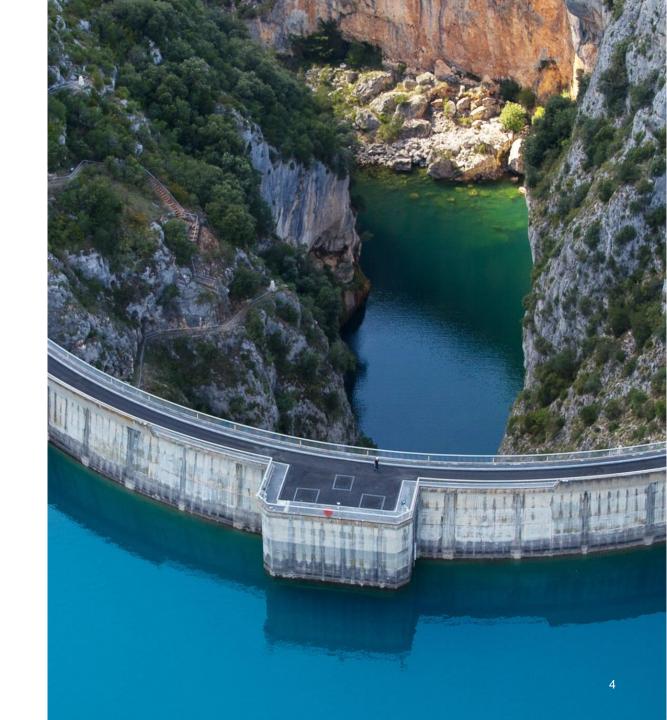
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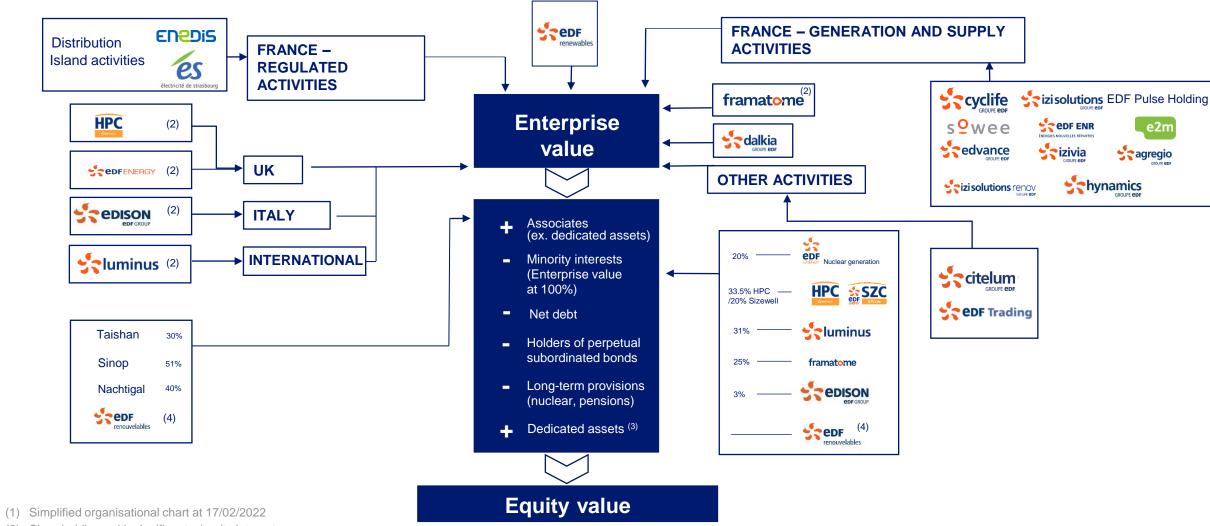


# **2021 ANNUAL RESULTS**STRATEGY AND INVESTMENTS



Strategy and investments

## EDF GROUP: ORGANISATIONAL CHART (1)



- (2) Shareholdings with significant minority interests
- (3) See slide "Performance of EDF SA's dedicated assets" on p.124
- (4) Companies and shareholdings held at different levels by the EDF Renewables group



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## **2030 - THREE STRATEGIC KEY PILLARS**

**CAP** 2030

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 territories shifting towards carbon neutrality

>15MtCO<sub>2</sub> AVOIDED EMISSIONS (1)

€10bn revenues IN SERVICES (2)

> 1.5 CONTRACTS/CUSTOMER (3)

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

**50%** CO<sub>2</sub>eq DIRECT EMISSIONS vs 2017

## **60**GW NET

>X2 NEW RENEWABLES CAPACITIES (INCL.HYDRO) VS. 2015

INITIATING NEW

EPRs & 1 SMR

An international key player in the energy transition

**EXIT** COAL

**1.5-2**GW NET

HYDRO INSTALLED CAPACITIES (4)

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 electric vehicle and energy savings certificates

- (3) EDF estimation for the 4 core countries, called G4 (France, Italy, United Kingdom and Belgium) (residential)
- (4) Excluding G4, i.e. 4 core countries (France, Italy, United Kingdom, Belgium)



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## **EDF ELECTRIC MOBILITY PLAN** (1)



#### **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* 

(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

#### **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



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## THE SOLAR PLAN



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

#### **TARGET**

BE A LEADER IN FRANCE

30% MARKET SHARE (1) BY 2035



#### C.5.5GW (2)

of grounded-based projects in development at end-2021



#### **c.330MW**

of secured projects at end-2021



#### **c.350MW**

under construction at end-2021



CRE tender 4.9 and 4.10: 196 MW awarded



Acquisition of 45% stakes in Green Lighthouse Development, French solar project developer, established in

Nouvelle-Aquitaine

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



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## **ELECTRICITY STORAGE PLAN** (1)



#### **TARGET**

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



#### **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**, 500,000h, 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)



## LAUNCH OF 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 major new projects and the existing nuclear fleet

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



#### **ACHIEVEMENTS 2021**

- Governance of 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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## **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 (1) and 4 ARE (2)
- 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

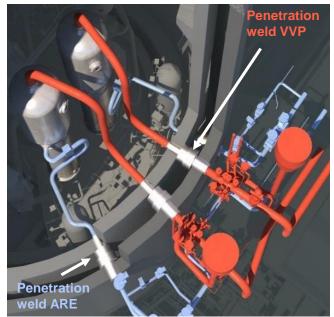
#### Other welds: Upgrading and repairing welds

- Number of welds involved: 45 VVP (1) and 32 ARE(2)
- 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







- (1) Steam discharge pipework circuit
- 2) Water supply circuit for steam generators



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## **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 (1)

- Test results in summer 2021 carried out 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 the 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 from end-2022 to Q2 2023. The estimated construction completion cost has increased from  $\in$ 12.4bn  $_{2015}$  to  $\in$ 12.7bn  $_{2015}$  (3)

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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 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



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## 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)



#### REMINDER ON KEY DATA (1)

- 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 from Unit 1 has been set at June 2026, compared to end-2025 as initially announced in 2016
  - The project completion costs are estimated at £ $_{2015}$ 22 to £ $_{2015}$ 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 cost to completion 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. A full cost and reference schedule review will be performed in 2022 including an
  update of the health crisis impacts
- 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, shareholders will be asked to provide additional equity. 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 on 27 January 2021 by deflating estimated costs in nominal terms using the British Construction OPI for All New Work index

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## 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 (1) 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 large-scale nuclear projects (2)

- 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 model, 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 into 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 a FID
- Not meeting these conditions could lead the Group not to take a FID

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### **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 and galleries
- 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 IWFA <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 for a GFA (General Framework Agreement) are ongoing on this basis

(1) IWFA: International Way Forward Agreement



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## **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" shutdown with reloading
- The 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 (2)
- Shutdown of reactor 1 and defueling operations in August 2021
- Reason for this loss of sealing: deterioration of the rod cladding owing to mechanical wear stemming from the rupture of small rod hold-down systems in the assemblies (3)
- 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



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## 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%) (2), 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 (3)
- The largest hydropower project ever built in Africa through nonrecourse 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



- (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

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## EXISTING NUCLEAR FLEET AND "GRAND CARÉNAGE" PROGRAMME

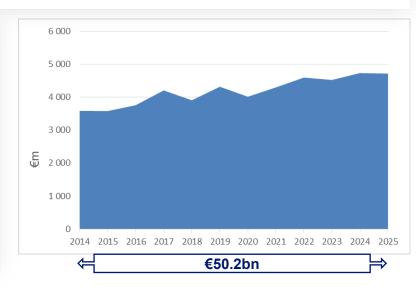
INDUSTRIAL STRATEGY

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  $\epsilon_{2013}$ 100 billion for the 2014-2030 period, the investment-expenditures estimated at  $\epsilon_{2013}$ 25.16 billion. Within the  $\epsilon_{2013}$ 24.73 billion of investment expenses between 2014 and 2030,  $\epsilon_{2013}$ 55 billion are dedicated to the 2014-2025 period, which allows the two estimates established by the EDF group and the Cour des comptes to be connected
- (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



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## **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

**2021 ANNUAL RESULTS** 

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



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

#### **PROJECT**

- Development of NUWARD™, a small modular reactor (SMR), in partnership with CEA, Naval Group, 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





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## **EDF, ACTOR IN THE HYDROGEN SECTOR**

Hydrogen is a key vector in the energy transition: it could meet 20% of worldwide energy demand in 2050 (1)

#### Complementarity with the EDF's low carbon mix

 EDF group's positioning on this market in line with its objective of carbon neutrality

#### **Favourable context**

• Government incentives in several European countries, including France (€7.2bn within the scope of the national strategy for the development of decarbonised hydrogen + "France 2030" investment plan: €1.9bn for the development of hydrogen activity)



## GROUP'S SUBSIDIARY PRESENT ACROSS THE VALUE CHAIN

#### 2021 achievements

- Commissioning of the largest hydrogen production and distribution station in France to fuel the buses of an urban transport network in Auxerre city,
- Signature of a renewable hydrogen sales contract to decarbonise public transport in Greater Belfort
- Prenotification of 830MW electrolysis capacity as part of the IPCEI programme (2) made of two projects:
  - the Hynovi project: developed in partnership with the cement company Vicat, has a 330MW capacity and will be used to produce syngas.
  - The Hyscale 100 project: developed by the teams at Hynamics Deutschland
- Strategic industrial and commercial partnerships with Vicat, SNCF, Gaussin and Alstom.
  - (1) McKinsey report Hydrogen Council 2019
  - (2) Important Project of Common European Interest

#### In Germany:

• In partnership with Orsted, the Heide refinery and Holcim Lafarge, a 500MW industrial project, *HyScale100*, by Hynamics prenotified by the German authorities as part of the IPCEI programme <sup>(2)</sup>.

HYDROGEN IN THE WORLD

#### In Italy:

 Edison develops, in partnership, five green hydrogen projects, of which refineries or steelworks decarbonation and distribution and alimentation of hydrogen in public transport (trains and buses)

#### In USA, Chile, Saudi Arabia and UK:

 Hynamics business supports for EDF group's subsidiaries (mainly EDF Renewables)





EDF STAKE IN McPHY
14.4% OWNED TO DATE BY EDF)

Leading player in the hydrogen sector

A complete range of solutions:

- Electrolysers
- Hydrogen charging stations
- Storage

McPhy has been prenotified as part of the IPCEI programme <sup>(2)</sup> for the financing of an electrolyser Gigafactory with a production capacity of several hundreds of MW/yr.





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## **FRANCE RELANCE**

	France Relance		
ENERGY RENOVATION OF BUILDINGS	> 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		
INDUSTRY DECARBONA- TION	<ul> <li>➤ €1.2bn over 2020-2022</li> <li>➤ Low carbon heat (heat recovery, biomass, heat pump, waste-to-energy, heat network, etc)</li> <li>➤ Energy efficiency and electrification of processes</li> </ul>		
NUCLEAR	<ul> <li>➤ €490m over 2020-2022</li> <li>➤ Maintain skills and support the competitiveness of businesses</li> <li>➤ Promote innovation, in particular the development of French small modular reactors (SMR) Nuward</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>		
HYDROGEN AND RENEWABLES	Put France at the forefront of generation technologies of renewable and low-carbon hydrogen (€7.1bn by 2030, of which €3.4bn by 2023)		
ELECTRIC MOBILITY	<ul> <li>Increased support for the purchase of clean vehicles (€1.9bn)</li> <li>Acceleration in the deployment of charging stations for electric vehicles: 100,000 charging stations expected in France by 2021, accessible to the public</li> </ul>		

France 2030	EDF entities benefiting from the government plan
	SeDF Solutions énergétiques dalkia smart building
<ul> <li>➤ €5bn by 2030</li> <li>➤ Reduce greenhouse gas emissions by 35% compared with 2015</li> </ul>	byeDF  cham GROUPE GEPF  S 2 W e e
<ul> <li>➤ €1bn by 2030 devoted to:</li> <li>the development of small modular reactors and innovative reactors enabling the fuel cycle to be closed</li> <li>the development in France innovative small-scale nuclear reactors with enhanced waste management</li> </ul>	framatome  cyclife
<ul> <li>Become the leader in green hydrogen</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 onshore and offshore wind and photovoltaic</li> </ul>	eDF renewables  hynamics GROUPE EDF
> Produce nearly 2 million electric and hybrid vehicles by 2030	izivia GAUFE EDF





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## CSR COMMITMENTS ACCORDING TO THE 4 CHALLENGES OF THE COMPANY RAISON D'ÊTRE (1)



## CARBON NEUTRALITY & CLIMATE

- · EDF: an ambitious carbon trajectory
- Carbon offsetting solutions
- Adapting to climate change
- Development of electricity and energy services



#### **WELLBEING & SOLIDARITY**

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

## PLANET RESOURCES PRESERVATION

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



**CSR** 

#### RESPONSIBLE DEVELOPMENT

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

- (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"



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## **APPLICATION OF 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 (2)
- 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

## NUCLEAR POWER INCLUDED IN EUROPEAN TAXONOMY (1)

- 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



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## 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 gouvernance

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 changes in climate
- Energy efficiency solutions to allow 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)

## **EDF** 2021 ANNUAL RESULTS

#### 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 Gren 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

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



Issue date	Fund raised	Funds allocated	Projects financed by the Green Bond	Part of the total investments financed by the Green Bond	Total net <sup>(1)</sup> capacity of the project financed (in MW)	Expected net <sup>(1)</sup> avoided CO2 emissions (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
0-4-0040		1,248 <b>M</b> €	EDF Renewables projects	54%	962	1.61
Oct. 2016	1.75Md€ -	502M€	EDF Hydro operations	100% (2)	903	0.01
lan 2017	26 000MV	14,021M¥	wind projects (EDF Renewables, Luminus)	15%	86	0.12
Jan. 2017	26,000M¥ -	11,979M¥	EDF Hydro operations + hydro Luminus project	87%	133	0.01
Sept. 2020 2.4	2.4Md€ _	2,246M€	projects + portfolio purchases by EDF Renewables, EDF ENR projects, Luminus projects	78%	1,412	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 will be published in the 2020 EDF URD document

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



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

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



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#### 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



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### **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 <u>only</u> 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 (2)
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

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## **NON-FINANCIAL RATINGS**



## MAINTENANCE IN THE MAJOR NON-FINANCIAL INDEXES:

(Non-exhaustive list)



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



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

Others

STOXX Global ESG Leaders

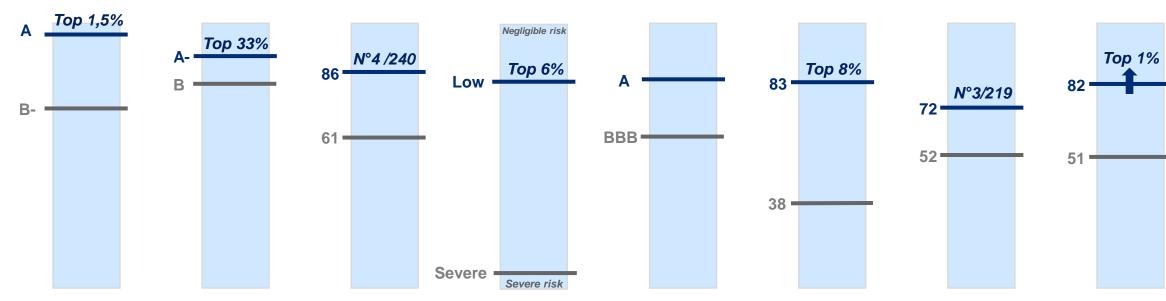
FTSE4Good



11

Sector avergae

Change vs. 2020 if ± 3 bps





**Water Security** 

ESG score

**ESG Risk Rating** 







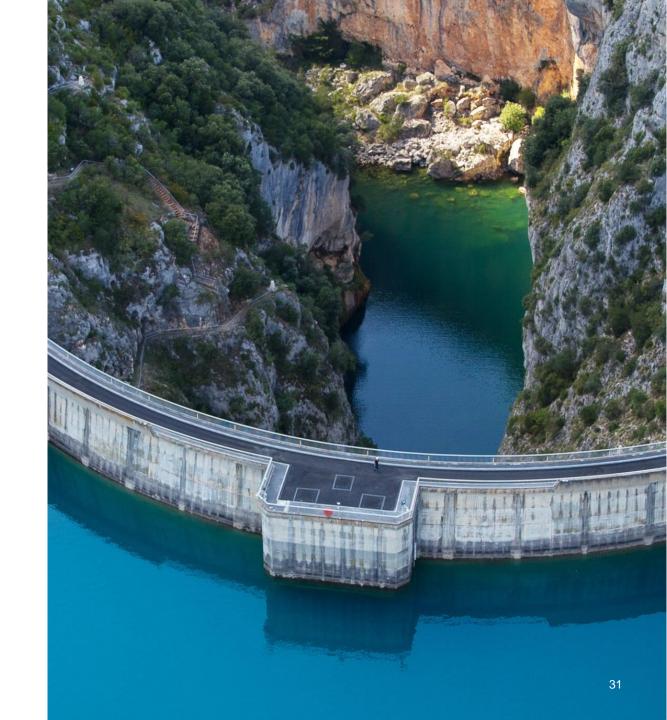








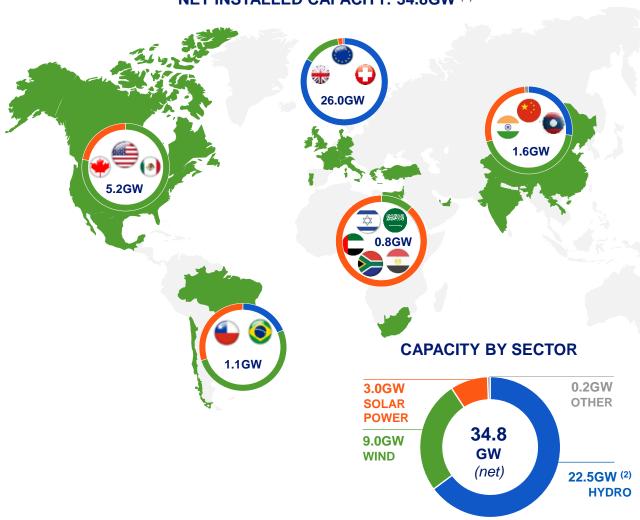
# **2021 ANNUAL RESULTS**RENEWABLES



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## EDF, THE EUROPEAN LEADER IN RENEWABLE ENERGY

NET INSTALLED CAPACITY: 34.8GW (1)



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)
- (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



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## A PORTFOLIO OF WIND AND SOLAR PROJECTS OF ~76GW (1)

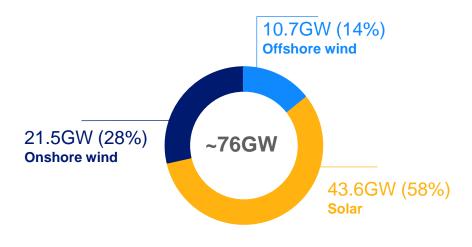
#### A PROJECT PORTFOLIO THAT IS **DIVERSIFIED GEOGRAPHICALLY...**



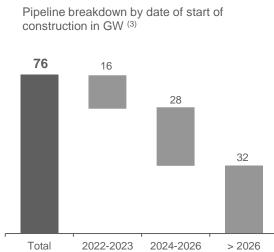
- (1) Pipeline excluding capacities under construction. Gross data corresponding to 100% of the capacity of the projects concerned.
- (2) All the projects in prospection phase included in the pipeline, starting 2020
- (3) Start of construction portfolio, not probability-based

## eDF

#### ... AND BALANCED BETWEEN WIND AND SOLAR





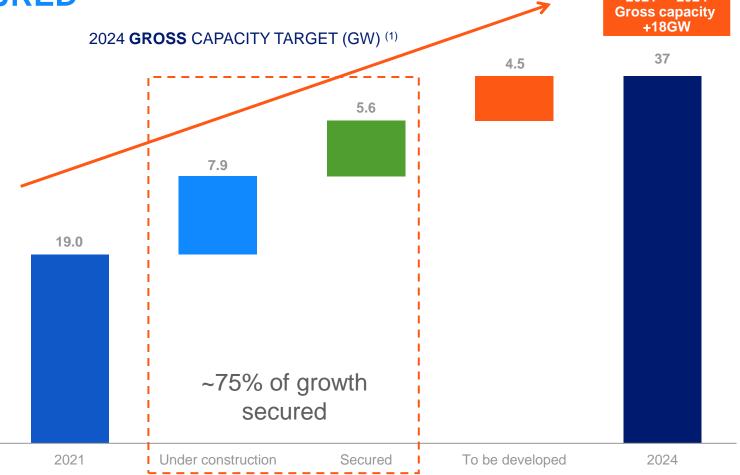


\*\*\* Securing a power purchase agreement (following a call for tenders, auction, OTC negotiation)

studies

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STRONG GROWTH EXPECTED THANKS TO MORE THAN 13GW OF PROJECTS ALREADY SECURED



NB: This presentation contains forward-looking statements based on targets. While management believes that these statements are based on reasonable assumptions at the time they were made, investors are informed that these assumptions are fundamentally uncertain and imply a certain amount of risk which can lead to materially different results and developments compared to what is presented. Recent supply chain tensions on equipment (notably solar) could lead to delays in commissioning of certain projects, in certain geographies. These mainly relate to delays of a few months in 2022 and 2023, which should not question the targets for 2024 or 2030.

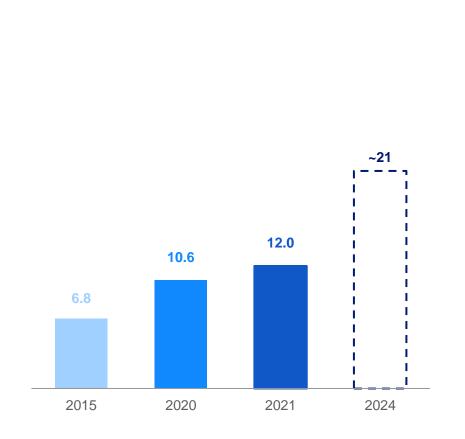
(1) Solar and wind. Gross data corresponding to 100% of the capacity of the projects concerned



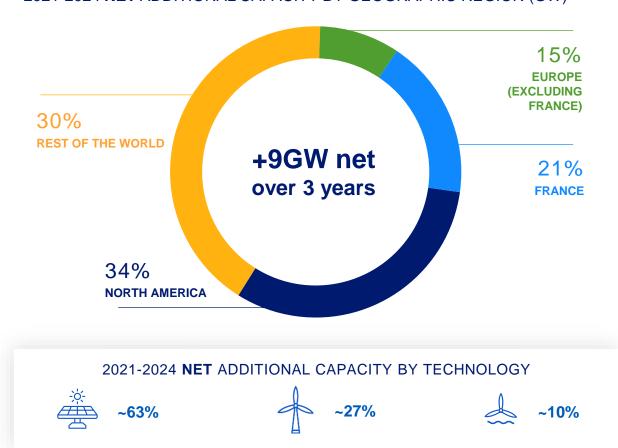
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## **BALANCED ACCELERATION ACROSS GEOGRAPHIES AND TECHNOLOGIES**

2024 **NET** INSTALLED CAPACITY TARGET (GW) (1)







NB: This presentation contains forward-looking statements based on targets. While management believes that these statements are based on reasonable assumptions at the time they were made, investors are informed that these assumptions are fundamentally uncertain and imply a certain amount of risk which can lead to materially different results and developments compared to what is presented. Recent supply chain tensions on equipment (notably solar) could lead to delays in commissioning of certain projects, in certain geographies. These mainly relate to delays of a few months in 2022 and 2023, which should not question the targets for 2024 or 2030.

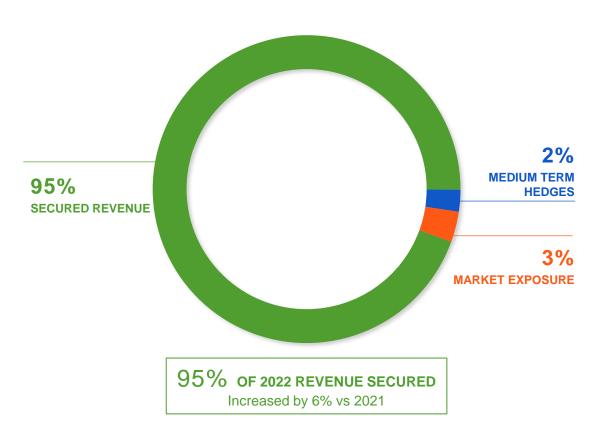
(1) Solar and wind. Installed capacity shown as net, corresponding to the consolidated data based on EDF's participation in Group companies, including investments in affiliates and joint ventures



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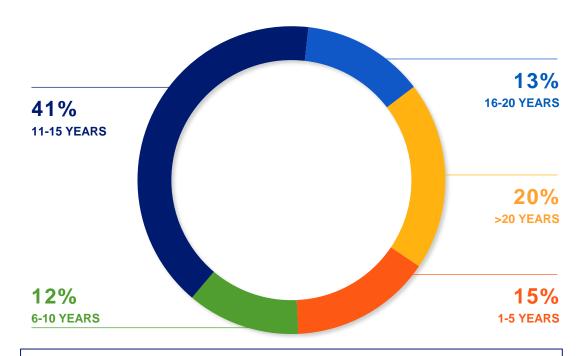
## REVENUE SECURED BY LONG-TERM CONTRACTS

**CONTRACTUALISATION** OF 2022 CONSOLIDATED REVENUE FROM RENEWABLE GENERATION (1)



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

#### **AVERAGE RESIDUAL DURATION OF LONG TERM CONTRACTS (2)**



THE AVERAGE REMAINING TERM OF THE CONTRACTS IS ~13 YEARS



## OFFSHORE WIND DEVELOPMENTS IN FRANCE: 5 PROJECTS FOR A TOTAL CAPACITY OF MORE THAN 2GW, INCLUDING ~ 1.5GW 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



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



#### Codling project in Ireland

- Equity investment of 50%
- Project under development in South Dublin, located on 2 adjacent sites
- Irish CfD ("RESS") auction targeted for 2022
- Total capacity: ~1GW



- Start of construction in 2019
- Total capacity: 450MW (54 turbines)
- Partnership with the Irish utility ESB at 50%
- Total investment: ~£2bn
- Contract for Difference (CfD) over 15 years (£114/MWh in  $\pounds_{2012}$ )



#### Blyth 2 project in England

- Floating demonstrator project near the Blyth 1 park (installed, 5 turbines for 42 MW
- Maximum capacity of 58 MW
- In partnership with Tenaga (investment in 2021 for the entire Blyth project), Malaysian utility



#### **Atlantic Shores project in the United States**

- Joint-venture company "Atlantic Shores Offshore Wind" (ASOW) with Shell
- ~750km² Lease Area secured 12-16 km off the shoreline in shallow waters
- Contract awarded in July 2021 by New Jersey Board of Public Utilities to ASOW to develop 1.5GW off New Jersey coasts
- Construction scheduled to begin in 2024



#### **Gwynt Glas project in Celtic sea**

- Equity investment in offshore wind farm project in Celtic sea with DP Energy
- Potential of 1GW (70km off the shorelines) to submit to future tenders



#### Dongtai IV and V projects in China

- Joint-venture with China Energy Renewables, a subsidiary of China Energy Investment Corporation
- Total capacity: **502MW** (Dongtai IV: 302MW, Dongtai V: 200MW)
- Commissioning of Dongtai V achieved in 2021 (Dongtai IV commissioned in December 2019)



## 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 (1)
- 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



Chaba wind farm, South Africa





Renewables

## A SUSTAINABLE BUSINESS MODEL BASED ON KEY COMPETITIVE

## **ADVANTAGES**

**DEVELOPMENT** 

~1,500 employees

**ENGINEERING &** CONSTRUCTION Key competitive advantages for the development of a strong project portfolio

- 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
- Expertise in site security, engineering, procurement, structured financial arrangements and participation in tenders
- Key local partnerships in order to share investments, country risk and maximize competitive advantage
- Strong portfolio, in renewal and with a good transformation rate
- Synergies within EDF group for customer-tailored solution (PPAs for commercial and industrial customers, offarid or decentralised offers)
- Strong engineering expertise
- Significant expertise in the construction of industrial-scale projects and operational excellence in delivering at budgets and deadlines
- Continued technical innovation to seize opportunities in new markets (floating PV, floating offshore wind, etc.)

**O&M AND ASSET** 

Integrated skills in O&M supporting operational excellence, optimised production, technological expertise

**DECOMMISSIONING** 

- Expertise on decommissioning of end-of-life assets
- Proactive approach on blades recycling (partnership with Siemens Gamesa for the deployment of offshore recyclable blades)
- (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)

**VALUE CREATION:** 

+150-200 bps

**DIFFERENCE BETWEEN** THE EXPECTED RETURN RATE AND WACC (2)

### 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 build 2 project 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



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## ~ 17.5GW OF O&M (1): 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

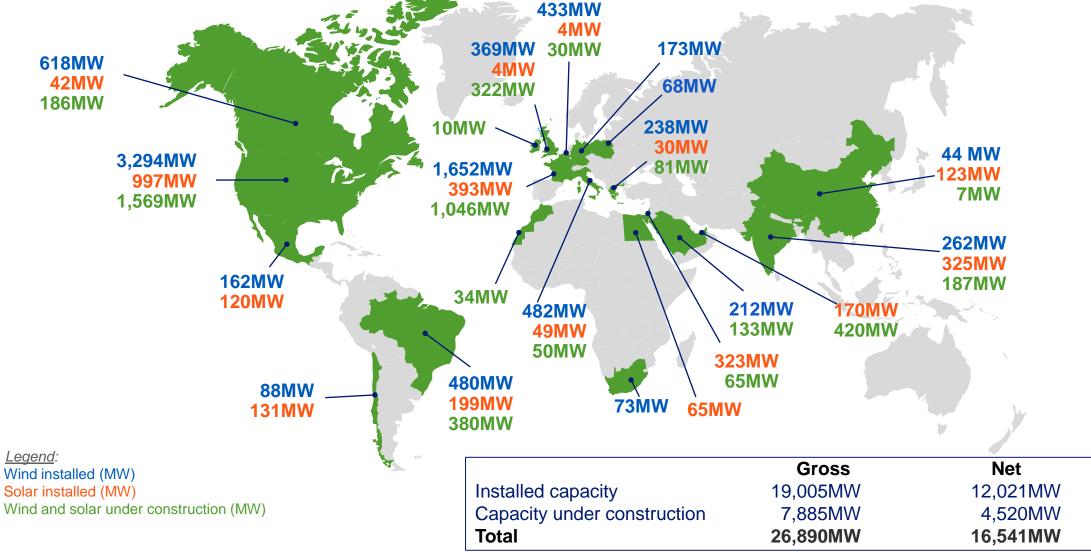
42

 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

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## **NET INSTALLED AND UNDER CONSTRUCTION CAPACITY – 31 DECEMBER 2021**





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

(in MW)	Gross (1)		Net (2)	
(III IVIVV)	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
Total installed capacity	17,142	19,005	10,578	12,021
Wind under construction	4,126	3,391	2,814	2,169
Solar under construction	3,865	4,495	1,928	2,350
Total capacity under construction	7,990	7,885	4,743	4,520

141

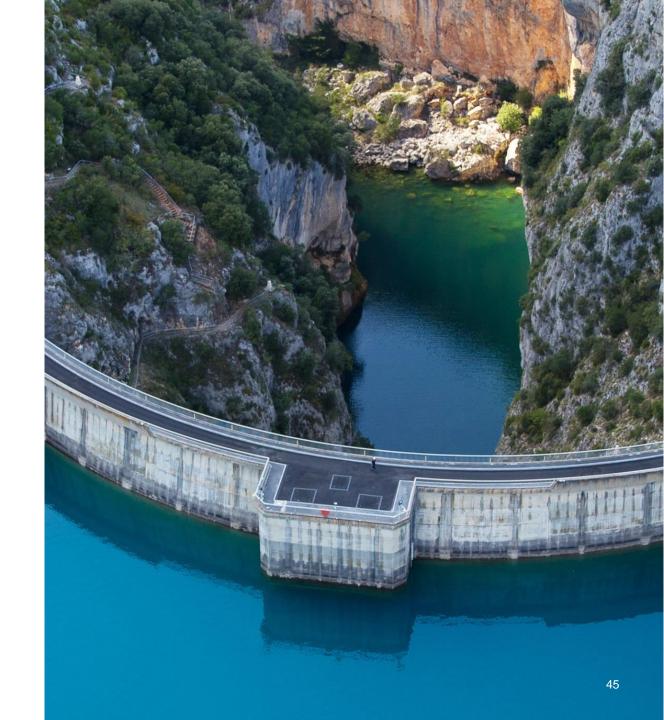
NB: The values correspond to the expression to the first decimal or integer closest to the sum of the precise values, taking into account rounding

<sup>(2)</sup> Net capacity: capacity corresponding to EDF's stake



<sup>(1)</sup> Gross capacity: total capacity of the facilities in which EDF has a stake

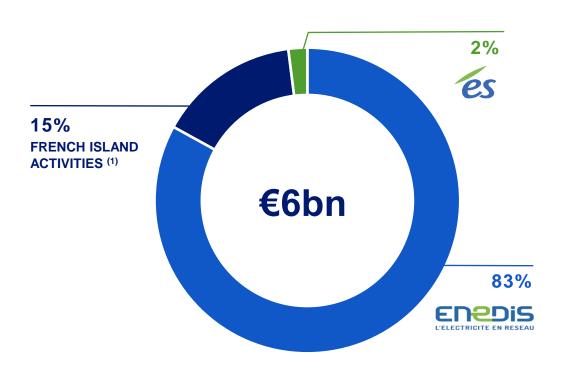
# **2021 ANNUAL RESULTS**REGULATED



## 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 Barthélémy, Saint Martin and Ponant islands



## French island activities (1)



#### **Key assets in France**

- 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
- 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%
- Grid of around 15,000 km (Strasbourg region)
- 560,000 delivery points
- Around 70% of EBITDA from regulated distribution activities



Regulated

## **ENEDIS (1): THE DISTRIBUTION NETWORK LEADER IN EUROPE**

**MAJOR DISTRIBUTION NETWORK PLAYER IN EUROPE** 

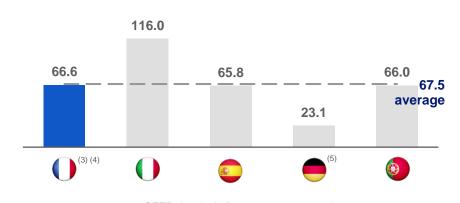


WELL **POSITIONED VS** PEERS...

### ... in terms of number of customers... In millions of delivery points 37 31 22 12 11 Enebis e-distribuzione **DE** e-distribución Data from operators' 2019 annual reports



SAIDI - Outage time, excluding exceptional events, in minutes per customer per year



2016 CEER data including transport outage time

- Enedis is an independent EDF subsidiary as defined in the French Energy Code
- Corresponds to the number of delivery points

World's smartest GRD

ENEDIS scope was 57 minutes in 2021

Specific to Germany, whose network is much denser than in other countries

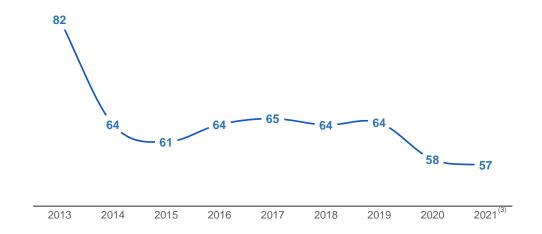
(3) Indicator including transport, excluding local distribution companies. The outage time in



### **ENEDIS** (1): TOP-TIER OPERATIONAL PERFORMANCE

#### **Top-tier operational performance...**

#### Outage time (2)



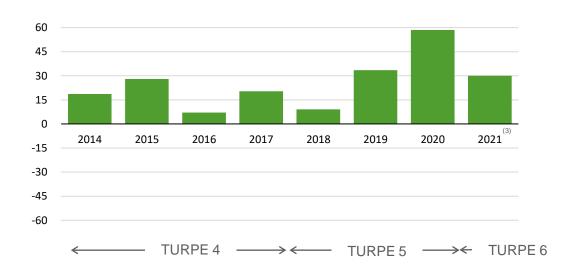
#### Lowest outage time for 2 years, at less than 60 minutes

- (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.



48

Regulated

## **ENERGY TRANSITION AT THE SERVICE OF THE TERRITORIES**

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





 Achieving 70% of the employee commitment index by 2024 (vs 58% in 2019)



 Aiming for zero serious or fatal accidents for teams and service providers

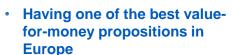




**Creating 20 new activities** (energy communities, electric transport solutions, data services, etc.) as part of projects and/or partnerships



- Enabling 100% of customers to monitor their consumption so as to better control it thanks to the smart meter, as well as to benefit from an innovative offer from their supplier.
- Reducing Enedis' carbon footprint by 20% by 2025 and achieve carbon neutrality in 2050





**Reconnecting 90% of** customers within two days in the event of a major climate incident on the grid























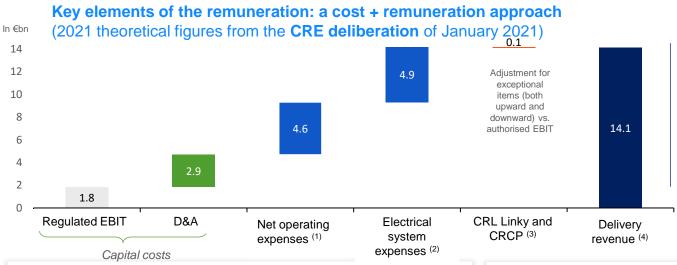






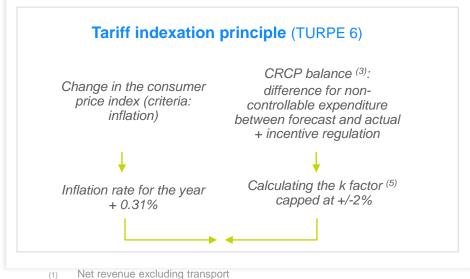
## **ENEDIS: TURPE 6, A MATURE REGULATORY FRAMEWORK**





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



% of revenues % of expenses covered by the covered by the **CRCP CRCP** French standard data. The difference with IFRS mainly corresponds to Enedis'

Income and expense (6) largely secured by the mechanism

of the Income and Expense Adjustment Account (CRCP):

- contribution to the Electricity Equalization Fund k factor = percentage change in the fee table resulting from the clearance of the
- Capital charges + operating charges + electric system charges





Power system charges = transport purchase from RTE + purchase of network

## TURPE 6 REMUNERATION STRUCTURE: A FAVOURABLE RISK PROFILE

#### A remuneration mechanism based on a guaranteed return

ENEDIS remuneration structure in 2020 according to the TURPE 6 (5) **Assets** financed **ENEDIS RAB EXCL. LINKY** by third parties RAB 2.5%<sup>(1)</sup> nominal return before tax on (€44.9bn) **Enedis €53.7bn** of RAB excl. Linky 2.5% (€53.7bn) **ENEDIS RE EXCL. LINKY** RE **2.3%**<sup>(2)</sup> nominal return before tax on **€8.8bn** of (€8.8bn) Regulated Equity 4.8% **LINKY RAB Linky RAB** 10.25%(4) 7.25%<sup>(3)</sup> of base nominal return before tax (€2.7bn) + 3.0%(3) premium on €2.7bn of RAB **2021 REGULATED EBIT** 

#### 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.

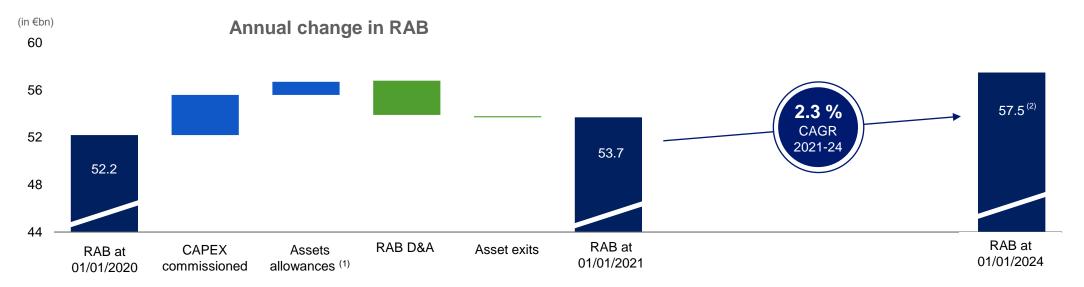
51

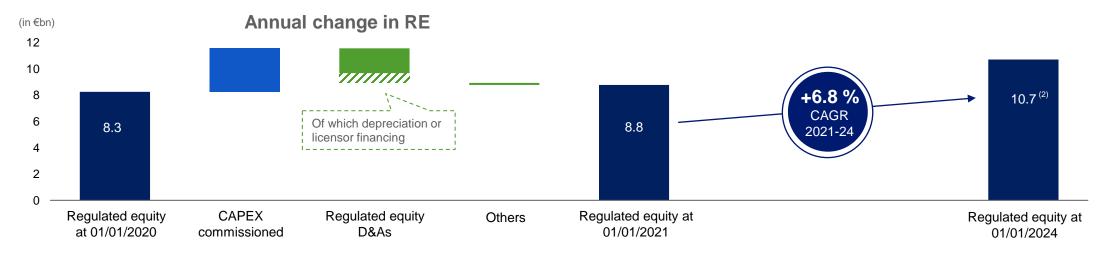
01/01/2021 figures

- (1) Asset margin = Asset beta x Market risk premium /  $(1 \tan x \arctan = 0.36 \times 5\% / (1 26.47\%) = 2.5\%$
- (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







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

<sup>(2)</sup> Estimated figures from the CRE deliberation

## LINKY (1): AN INCENTIVE TARIFF FRAMEWORK

LINKY: THE ROLLOUT PROGRAM FOR NEW SMART METERS







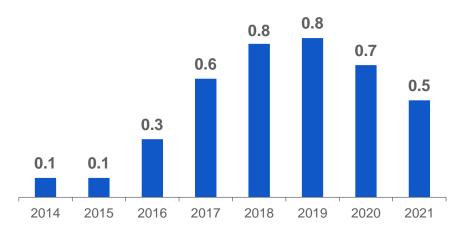


Specific regulation over 20 years (Linky-dedicated RAB)

AN ATTRACTIVE REMUNERATION STAGGERED OVER TIME

#### 2014-2021 Investment pattern

in €bn



#### **Linky – Remuneration**

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



→ 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

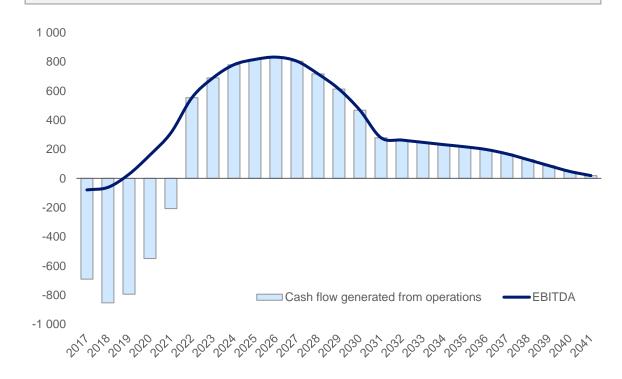
Additional premium of 3% / Penalties of -2 %, depending on the respect of costs, deadlines and performance of the system during the deployment phase



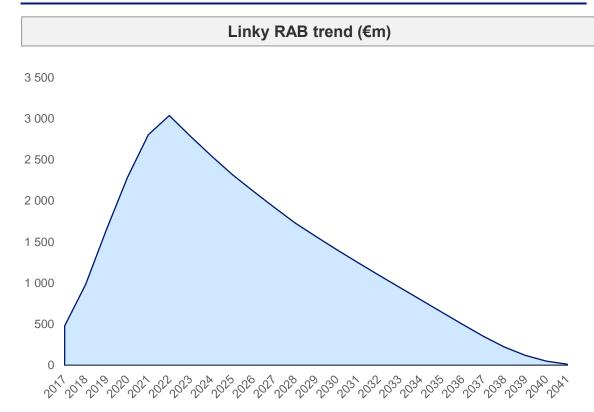
### **LINKY: A SIGNIFICANT CONTRIBUTION TO CASH-FLOW FROM 2022**

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





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



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- 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

(1) With current accounting standards



## **ENEDIS** (1): **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 (2)	3,962	4,379	+10.5

<sup>(2)</sup> Including Linky



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

## ISLAND ACTIVITIES (1): SPECIFIC REGULATION AND OPERATIONAL PERFORMANCE SUPPORTING STABLE REVENUES

MAJOR ASSETS AT THE HEART OF THE TERRITORIES







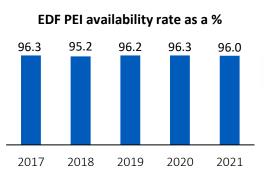


REGULATED ASSETS,
OPERATED
EFFICIENTLY,
GENERATING A STABLE
EBITDA

<u>Generation assets</u>: 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 (3))

- 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 (4)
- \*\* o/w about a third related to grid activity, and excluding regularisation account

A CONTRIBUTION TO THE ENERGY TRANSITION IN ZNI (2) **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.



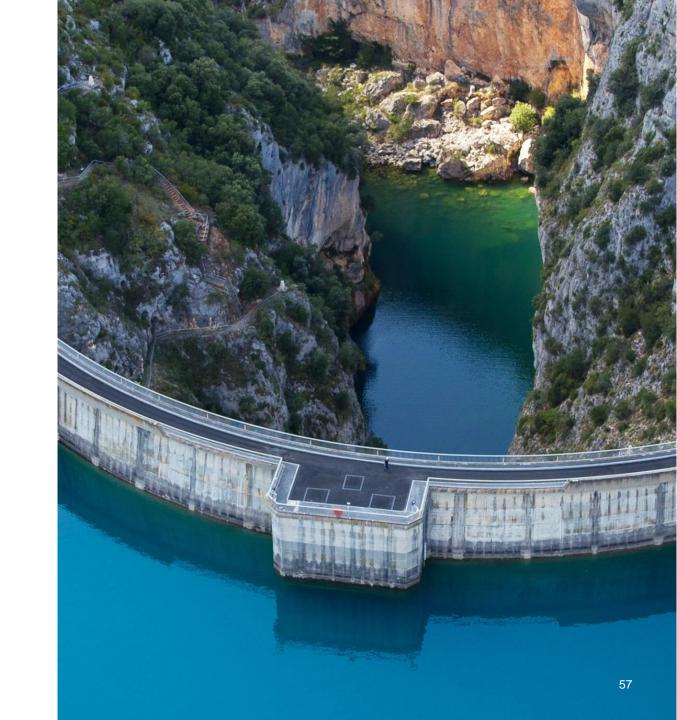
- (1) French island electrical activities include Corsica, Martinique, Guadeloupe, French Guiana, Réunion and Saint Pierre and Miquelon
- (2) ZNI = non-interconnected zones

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

(4) CRCP of the FPE

## **2021 ANNUAL RESULTS**

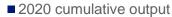
FRANCE – GENERATION AND SUPPLY



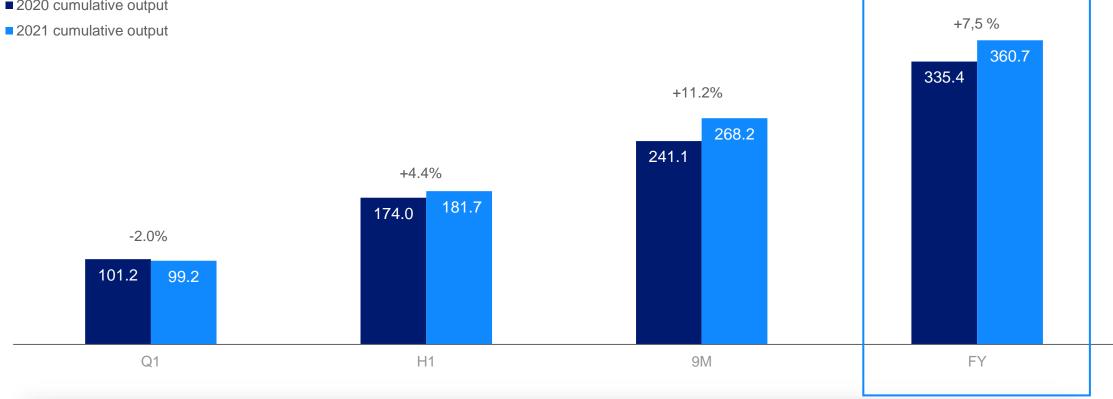
France – Generation and supply

## FRANCE NUCLEAR OUTPUT

(in TWh)





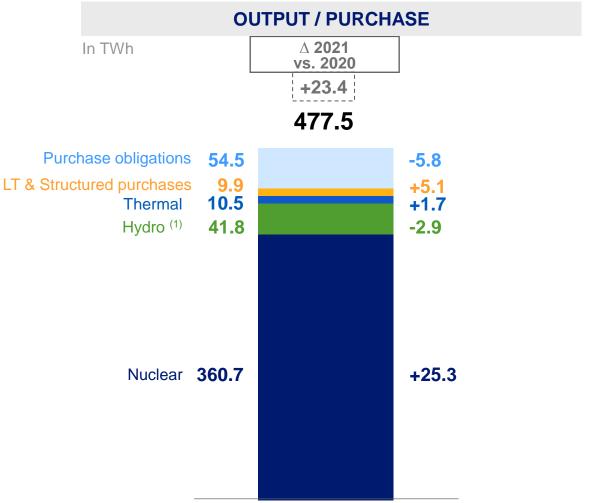


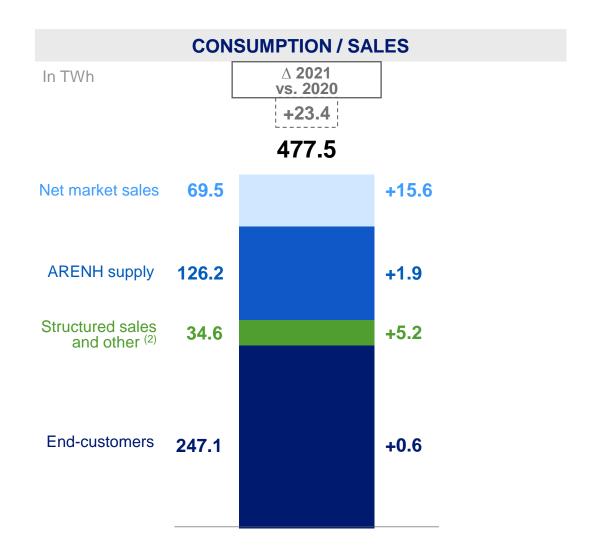
Nuclear output of 360.7TWh for 2021, up 25.3TWh from 2020 despite the closure of the two reactors at Fessenheim. This is mainly explained by a better availability of the nuclear fleet in 2021, and by lower modulation.



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### FRANCE: UPSTREAM / DOWNSTREAM ELECTRICITY BALANCE





NB: EDF excluding French islands electrical activities

(1) Hydro output after deduction of pumped volumes: 35.9TWh on 2021 / 38.5TWh on 2020

(2) Including hydro pumped volumes of 5.9TWh on 2021 / 6.2TWh on 2020

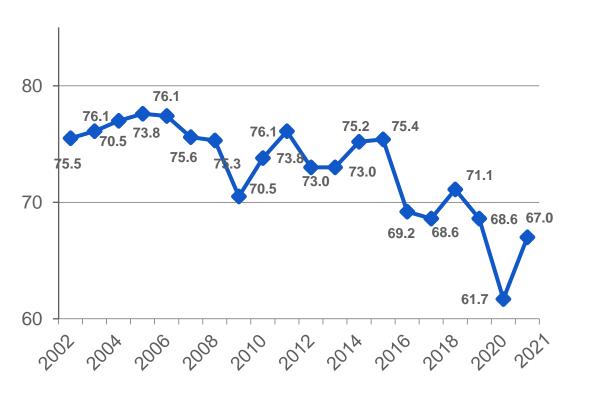


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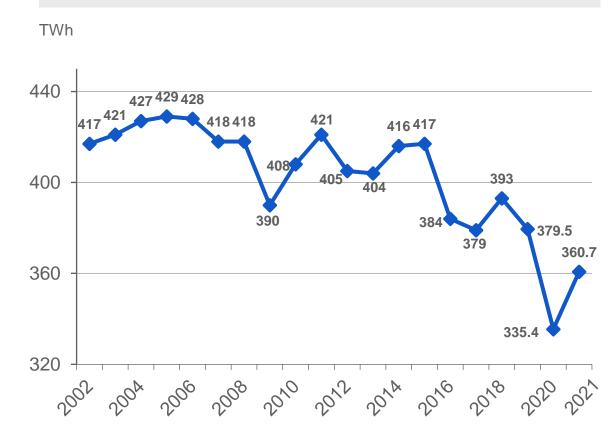
### CHANGE IN LOAD FACTOR AND NUCLEAR OUTPUT

#### Annual load factor of nuclear fleet in France

Load factor (%)



#### Net output of PWR (1) fleet in France

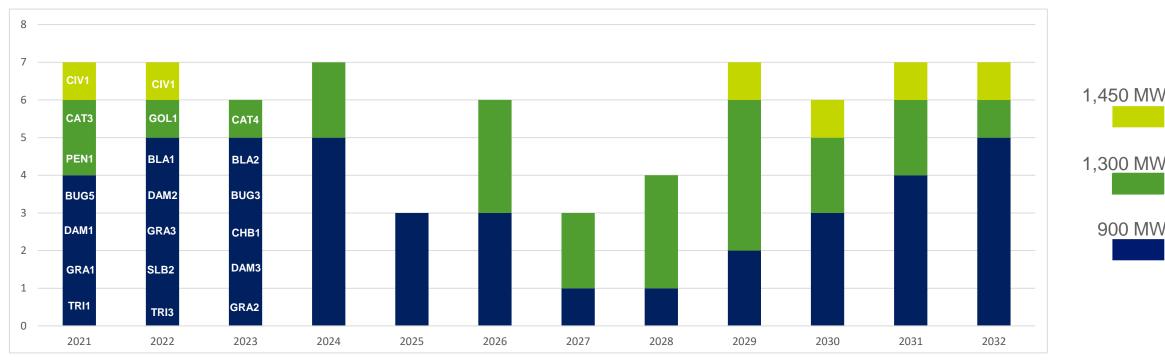


(1) Pressurized Water Reactor



## 10-YEAR INSPECTIONS OF THE NUCLEAR FLEET

Number of 10-year inspections





3<sup>rd</sup> 10-year inspection of 1,300MW reactors

4<sup>th</sup> 10-year inspection of 1,300MW reactors

2<sup>nd</sup> 10-year inspection of 1,450MW reactors

3<sup>rd</sup> 10-year inspection of 1,450MW reactors

In 2029, series 900: Tricastin 1 will be the first reactor to realise its 5<sup>th</sup> 10-year inspection

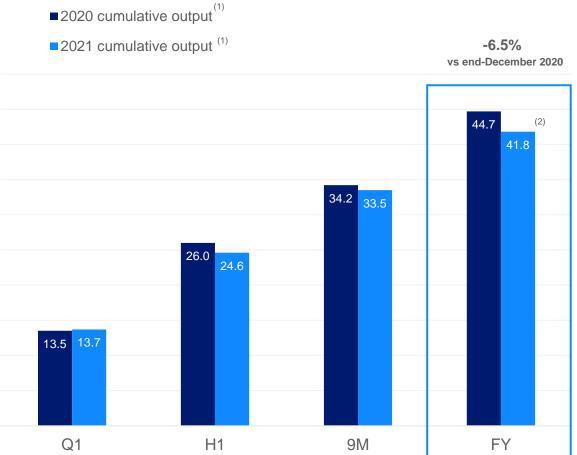


NB: forecast data on 31 December 2021

France – Generation and supply

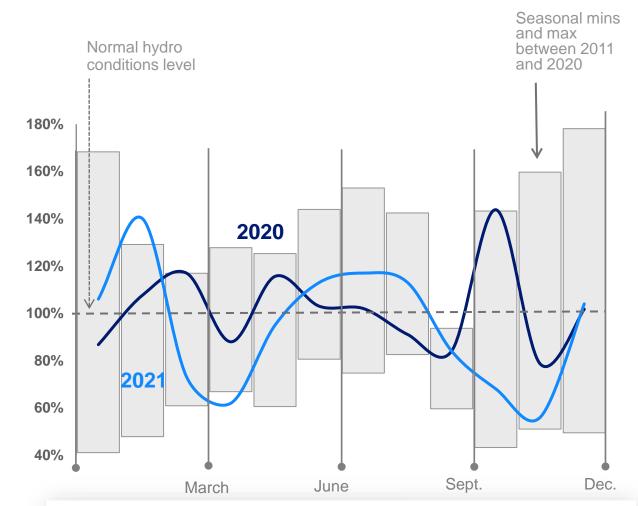
## **EDF HYDRO OUTPUT**

(in TWh) ■2020 cumulative output (1)





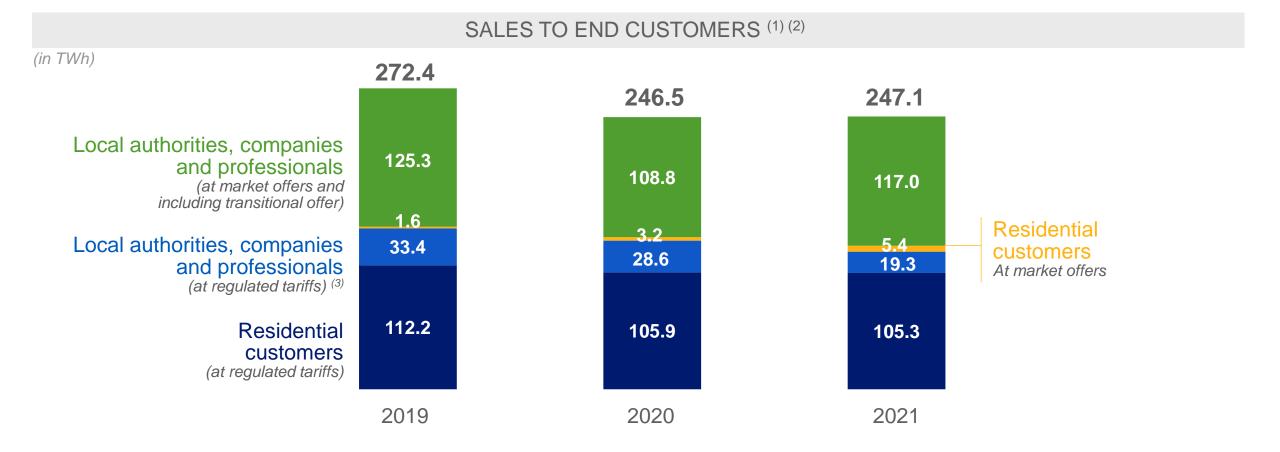
(2) Production after deduction of pumped volume consumption: 38.5TWh in 2020, and 35.6TWh in 2021.



- 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



### **ELECTRICITY SUPPLY IN FRANCE**



<sup>(3)</sup> Blue professional tariff, LDC (Local Distribution Companies) at transfer price and Yellow and Green tariffs, below 36kVA that persist beyond 2015



<sup>1)</sup> Rounded to the nearest tenth

<sup>2)</sup> Including EDF's own consumption

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## **ELECTRICITY SUPPLY IN FRANCE – SALES UNDER REGULATED TARIFFS SPLIT**



(in TWh)



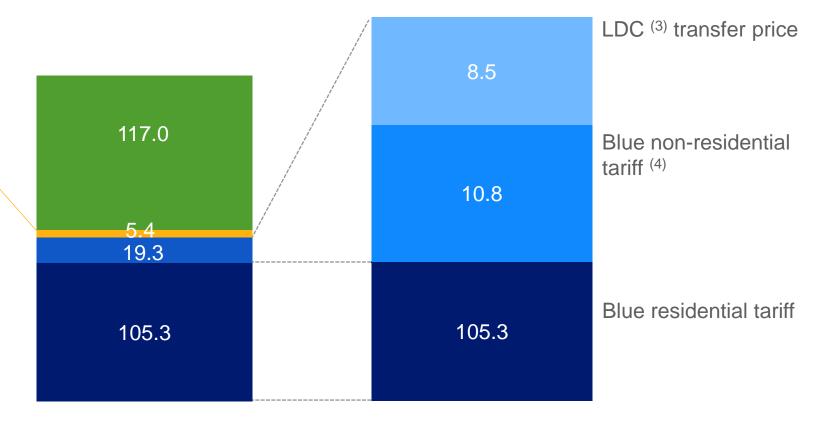
Residential customers

At market offers

Local authorities, companies and professionals

At regulated tariffs

Residential customers
At regulated tariffs



Of which Yellow and Green tariffs for 0.06TWh - Tariffs lower than 36 kVA



<sup>(1)</sup> Rounded to the nearest tenth

<sup>(2)</sup> Including EDF's own consumption

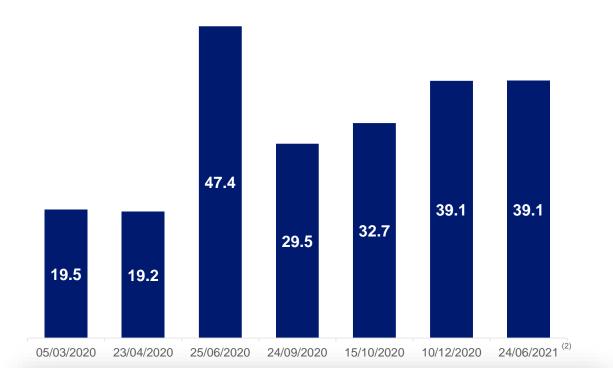
<sup>(3)</sup> Local Distribution Companies (LDCs)

## **CAPACITY MARKET IN FRANCE**

#### CAPACITY AUCTION PRICES (1)



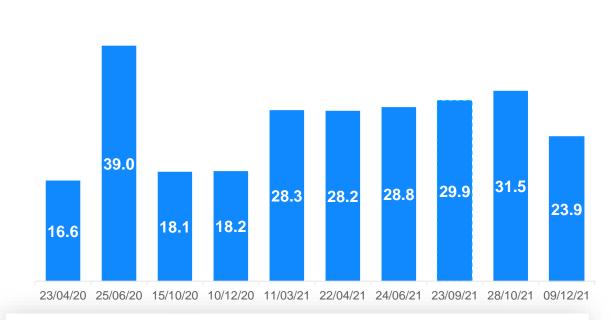
(in €/kW)



- ➤ Volume of certified EDF capacities: 63.5GW at early-January 2022
- ➤ Average Price (3): €31.2/kW



(in €/kW)



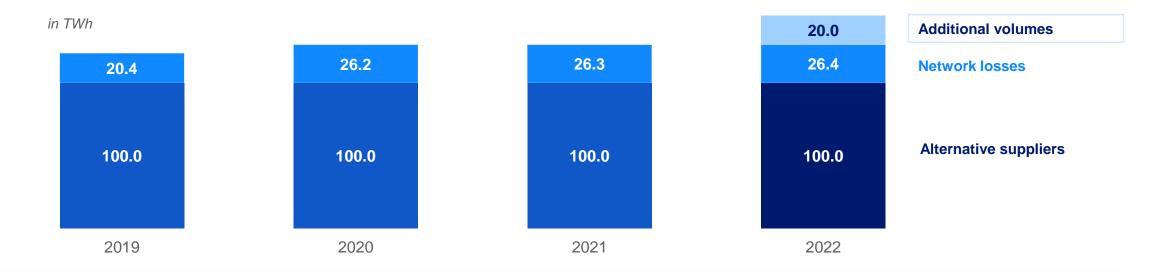
- ➤ Volume of certified EDF capacities: 64.3GW at early-January 2022
- ➤ Average price (3): €26.2/kW

NB: the first auction for delievry in 2023 is scheduled in 24 March 2022

- ) Data rounded to nearest tenth
- 2) Rebalance session
- Does not take into account rebalance sessions



### **ARENH: VOLUMES ALLOCATED**



- > Historical situation: maximum annual sales volume of 100TWh (1) 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 (2), 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

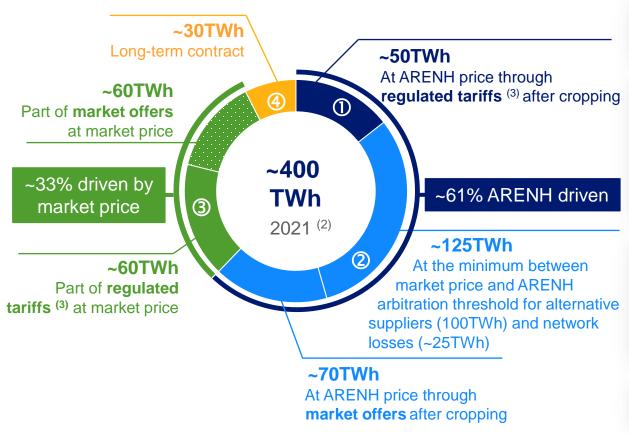
Source: CRE

- (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) Pending application decree



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## DISTRIBUTION OF ELECTRICITY SALES (1) ACCORDING TO THEIR MARKET PRICE EXPOSURE



- (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



- 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 (4), which include:
- The ARENH volumes that can be requested by alternative suppliers and network operators for their purchases of losses
- Part of the volumes (5) 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
- Ontracts at negotiated prices that do not follow a market-indexed structure
- (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"

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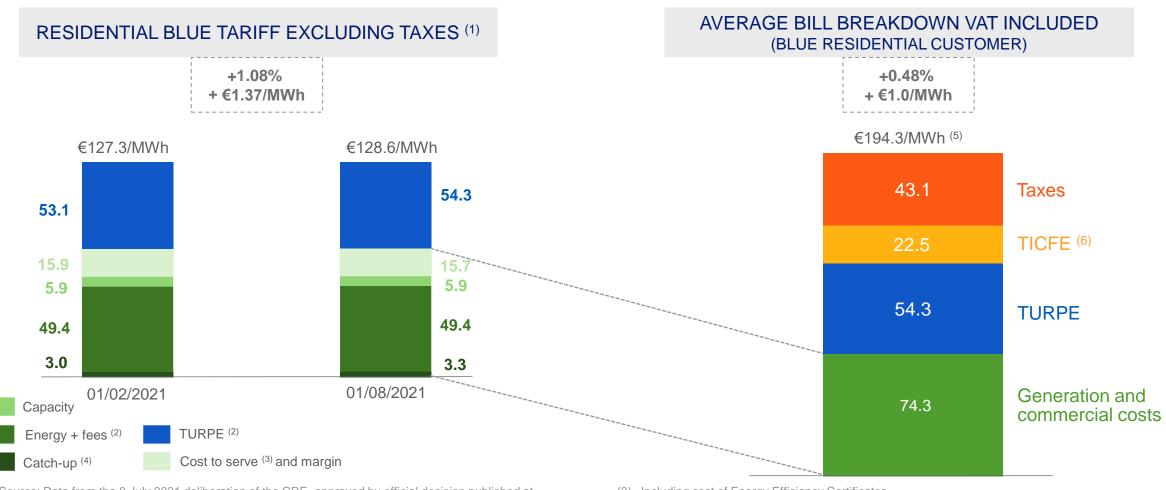
## **REGULATED SALES TARIFFS IN FRANCE (1/3)**

## **Change in Blue tariff**

Date	Change in Resid	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 (1)	+24.3%	+4.0%	+23.6%	+4.0%	



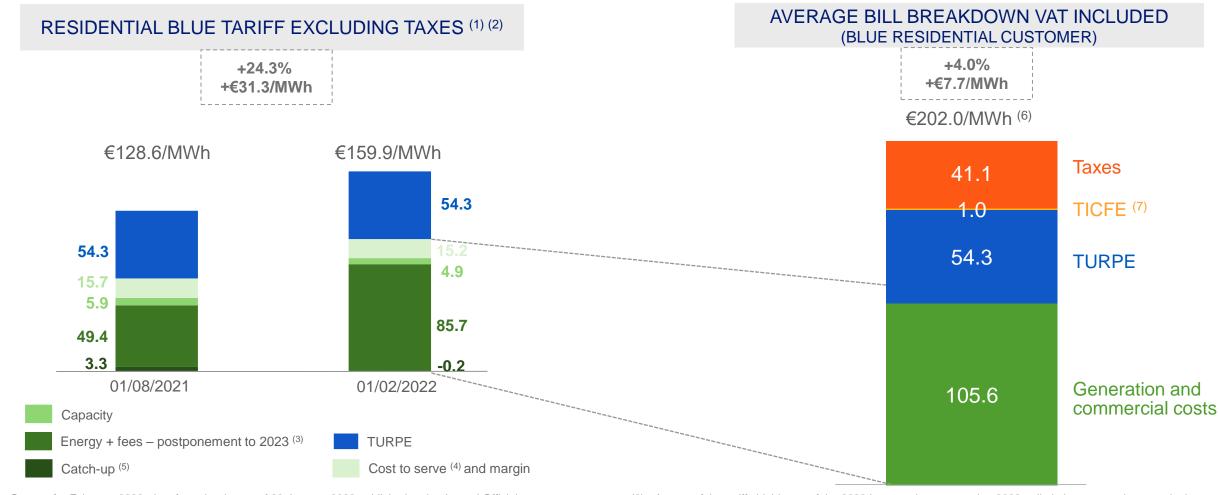
## **REGULATED SALES TARIFFS IN FRANCE: CHANGE IN AUGUST 2021 (2/3)**



- (1) Source: Data from the 8 July 2021 deliberation of the CRE, approved by official decision published at the Journal Officiel on 31 July 2021
- (2) At August 2021 and February 2021, the "Energy + fees" and "TURPE" 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 08/07/2021)

- (3) Including cost of Energy Efficiency Certificates
- (4) Balance of over-coverage 2018 + catch up due to tariff freeze at the beggining of 2019 +commercial costs 2020
- (5) Due to rouding, the total is not strictly equal to the sum of the components
- (6) Ex-CSPE

## **REGULATED SALES TARIFFS IN FRANCE: CHANGE IN FEBRUARY 2022 (3/3)**



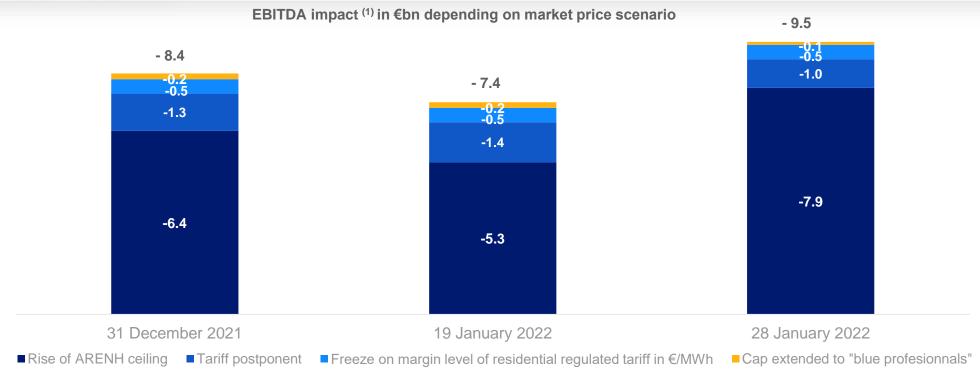
- (1) Source: for Feburary 2022, date from the decree of 28 January 2022 published at the Journal Officiel on 30 January 2022
- (2) At August 2021 and February 2022, the figures are based on an average calculation on customers portfolio at the Regulated Sales Tariffs at end-2020 (base calculation for the CRE deliberation of 18/01/2022)
- eDF

- (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 rouding, the total is not strictly equal to the sum of the components
- (7) EX CSPE 70

### 2022 EBITDA SENSITIVITY TO REGULATORY MEASURES

Measures as announced on 13 January 2022 and EBITDA impacts based on market prices at 31/12/2021:

- 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 -€3.1bn
- The impact of this additional allocation is replicated in EDF offers (regulated tariffs and market offers): impact estimated at around -€3.3bn
- Margin level freeze in €/MWh for residential regulated tariffs: impact estimated at around -€0.5bn
- Portion of the 2022 residential regulated tariff postponed to 2023, aiming at limiting the increase to 4% including taxes: impact estimated at around -€1.3bn
- 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 -€0.2bn





**2021 ANNUAL RESULTS** (1) Illustrative figures

## PUBLIC SERVICE COSTS: STABLE MECHANISM FOR COMPENSATING PUBLIC SERVICE COSTS AND TAXES SINCE 2016 (1/3)

- > 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



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## CSPE: CHARGES FOR EDF (2/3)

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		202	2020		
Purchase obligation (1)	5,699	74%	6,158	76%	3,342	61 %
Other (2)	1,963	26%	1,923	24%	2,130	39 %
Total EDF CSPE	7,662	100%	8,081	100%	5,472	100%

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 (3)
- (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



2021 ANNUAL RESULTS

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## CSPE: CHANGE IN PURCHASE OBLIGATIONS IN MAINLAND FRANCE FOR EDF (3/3)



**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

<sup>(2)</sup> The compensation mechanism of public energy services charges also covers the tariff equalization costs in the ZNI (Zones Non Interconnectées), and the solidarity programs.



<sup>(1)</sup> EDF SA excluding island activities

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#### **ENERGY EFFICIENCY CERTIFICATES SYSTEM**

Implemented in 2006 Confirmed in 2021 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.

Enhanced targets, a greatly increased scheme cost

Publication 5th period obligation

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).

- > 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%)
- ➤ The measure costs over €5bn a year
- > Rebalance of the obligation between energies, historically unfavourable to electricity (Elec +4% / Gas +58% / Fuels 18% compared with the 4th period)
- > Phased lowering of the franchise threshold (400 GWh/year →100GWh/year from 2024) to limit distortions to competition
- > Limitation of "Coups de Pouce" schemes and more generally bonuses (25% of the obligation)
- > 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.
- > 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.

Involved parties

An obligation imposed on energy suppliers to achieve energy savings for customers called "obligated parties".

> Electricity, gas, heating, refrigeration, domestic fuel and automotive fuel

In order to promote the issuance of energy efficiency operations to their customers

> Households, local authorities, social housing landlords or business/professionals

EDF and the mechanism

EDF is the first obligated party and intervenes in several areas:

> 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

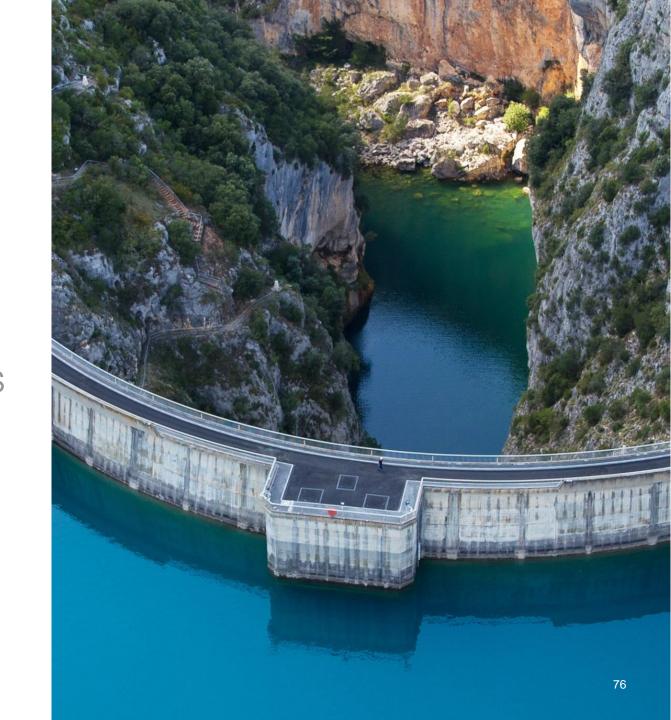
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> Financing of national programmes : ADVENIR (electric vehicle recharging stations), FEEBat (training craftsmen), SARE (Service d'Accompagnement pour la Rénovation Energétique) with the ADEME, ACTEE with the FNCCR, etc.



## **2021 ANNUAL RESULTS**

CONSOLIDATED FINANCIAL STATEMENTS



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### SIMPLIFIED INCOME STATEMENT

In millions of euros	2020	2021
Sales	69,031	84,461
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
EBITDA	16,174	18,005
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)
EBIT	3,875	5,225
Financial income	(2,582)	360
Income before taxes of consolidated companies	1,293	5,585
Net income – Group share	650	5,113
Net income excl. non-recurring items (1)	1,969	4,717





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#### **CHANGE IN SALES** (1)

In millions of euros	2020	Forex	Scope	Organic growth	2021	$\Delta$ % org. <sup>(2)</sup>
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
Total Group	69,031	238	274	14,918	84,461	+21.6

<sup>(3)</sup> Regulated activities: Enedis, ÉS and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code



<sup>(1)</sup> Breakdown of sales across the segments, before inter-segment eliminations

<sup>(2)</sup> Organic change at constant scope and exchange rates

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#### **CHANGE IN EBITDA** (1)

In millions of euros	2020	Forex	Scope	Organic growth	2021	∆% org. <sup>(2)</sup>
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
Total Group	16,174	9	(3)	1,825	18,005	+11.3

<sup>(3)</sup> Regulated activities: Enedis, ÉS and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code

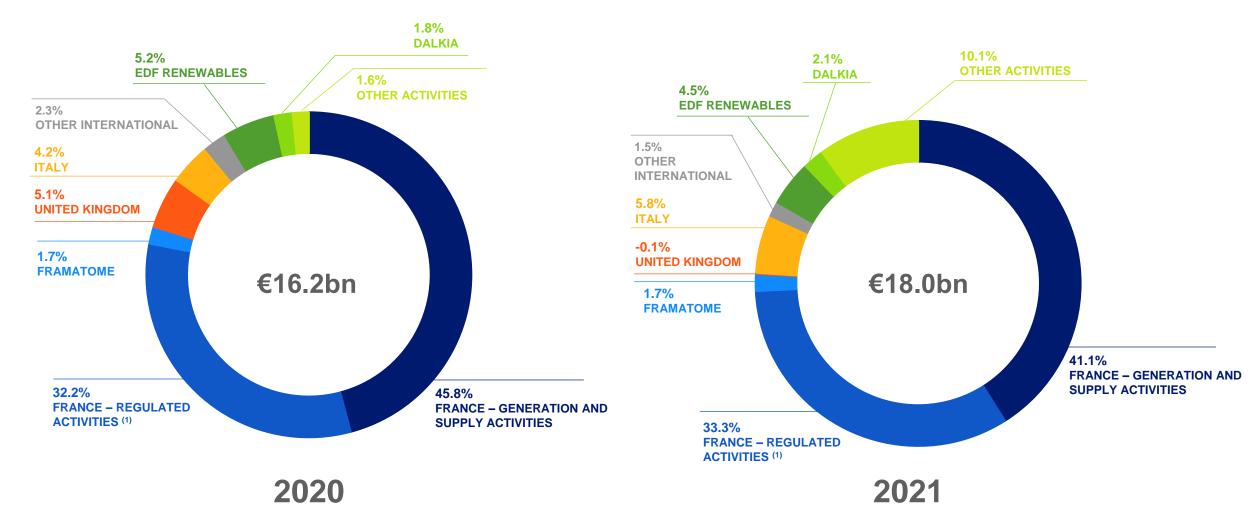


<sup>(1)</sup> Contribution to the Group

<sup>(2)</sup> Organic change at constant scope, standard and exchange rates

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#### **BREAKDOWN OF GROUP EBITDA**

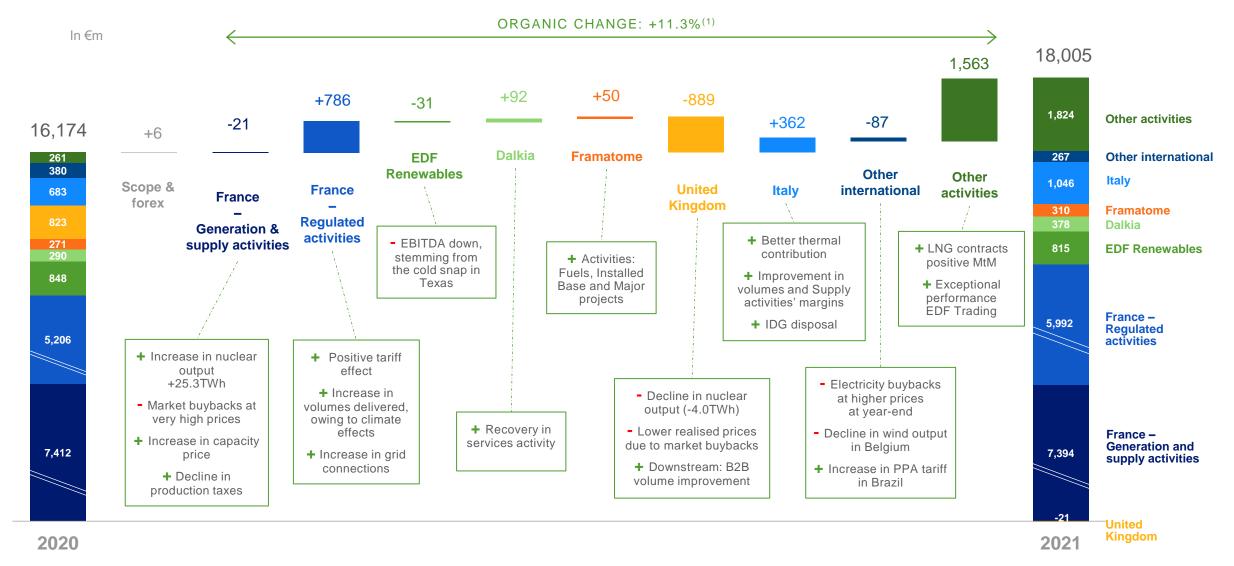


(1) Regulated activities: Enedis, ÉS and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code



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#### **GROUP EBITDA BY SEGMENT**





Consolidated financial statements

#### RENEWABLES ENERGIES

#### **EDF RENEWABLES** Δ % 2021 2020 In €m Org.(1) -3.9 -3.7 **EBITDA** 815 848 -3.1 o/w production EBITDA 904 877 -3.0

- Extreme cold snap in **Texas**, leading to energy buybacks at very high levels and an estimate impact of -€95m on EBITDA
- **Production** of 17TWh, +10.5% owing to growth in commissioned capacity
- Better contribution from DSSA (Development & Sale of Structured Assets) transactions in the USA and in Portugal
- Continued development with 27% growth in the 73 GW pipeline of wind and solar projects

- Organic change at comparable scope, exchange rates and standards.
- Hydro France EBITDA of €3,221m in 2021 and €531m in 2020. For the renewable energy generation optimised within a larger portfolio of generation assets, in particular relating to the French hydro fleet after deduction of pumped volumes, revenue and EBITDA are estimated, by convention, as the valuation of the output generated at spot market prices (or at purchase obligation tariff) without taking

GROUP RENEWABLE	S EXCLUD	ING HYDRO	FRANCE <sup>(2)</sup>	
In €m	2020	2021	Δ %	$\Delta$ % Org. <sup>(1)</sup>
EBITDA excluding Hydro France <sup>(2)</sup>	1,331	1,279	-3.9	-4.1
Net investments	(1.010)	(1.351)	+33.8	_

#### **EBITDA**

- EDF Renewables: Impact of the extreme cold snap in Texas in Q1 2021
- Belgium: Decline in wind production
- Italy: Increased contribution from renewable generation
- Increase in net investment linked to the acquisition in 2021 of 70% of E2i (Edison's renewables platform)





GROUP RENEWABLES: PROJECTS UNDER CONSTRUCTION AT 7.9GW GROSS, WIND AND SOLAR AT END-DECEMBER 2021, STABLE VS DECEMBER 2020 (CONSTRUCTION STARTS +3,0GW NET OF COMMISSIONINGS OF +3.1 GW)

into account hedging effects, and include the valuation of the capacity, if applicable. This convention is the best reflection of the use of the hydro fleet and differs from the convention used in the France -Generation and supply activities, in which hydro output is valued on the basis of an average hedged price for the generation fleet.

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#### **ENERGY SERVICES**

DALKIA								
In €m	2020	2021	Δ %	$^{\Delta}$ % Org. $^{ ext{(1)}}$				
EBITDA	290	378	+30.3	+31.7				

- > Strong EBITDA growth of close to 32%:
  - Recovery in business for services and construction
  - Growth in the UK



CONTRACTS OF ENERGY TRANSITION AWARDED FOR THE OPERATION AND MAINTENANCE OF HEAT NETWORK (BIOMASS OR BIOGAS)

(1) Organic change at comparable scope, exchange rates and standards.



GROUP ENERGY SERVICES(2)							
In €m	2020	2021	Δ %	$^{\Delta}$ % Org. $^{ ext{(1)}}$			
EBITDA	318	441	+38.7	+38.4			
Net investments	(438)	(447)	+2	-			

- **EBITDA** 
  - Recovery of Dalkia and Edison businesses after the health crisis in 2020
  - Growth in services sales in France
- Net investments stable overall



CITELUM/DALKIA ELECTROTECHNICS: WINNER OF A 10-YEAR PUBLIC STREET LIGHTING CONTRACT FOR THE CITY OF PARIS

(2) The Group energy services include Dalkia, Dalkia Electrotechnics (formerly Citelum), CHAM, SOWEE, IZI Solutions, IZI Solutions Renov, Izivia, EDEV, EDF China Holding, EDF Pulse croissance and the service businesses of EDF Energy, Edison, Luminus and EDF SA. They consist in particular of street lighting, heating networks, decentralised low-carbon generation based on local resources, energy consumption management and electric mobility.

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#### **FRAMATOME**

In €m	2020	2021	Δ %	$\Delta$ % Org. <sup>(1)</sup>
EBITDA	534	584	9.4	11.4
EBITDA EDF Group contribution	271	310	+14.4	+18.5

- Better production of "Fuel" plants and "Primary components manufacturing" partly linked to the strong business levels
- > Higher sales volumes for Installed Base business in North America and in France
- > Continuation of the action plan on overhead costs





**ORDER INTAKE 2021**: €3.7bn<sup>(2)</sup>

- (1) Organic change at comparable scope, exchange rates and standards.
- (2) At Framatome perimeter.
- (3) See 8 November 2021 Framatome press release.



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#### **OTHER INTERNATIONAL**

In €m	2020	2021	Δ %	∆ % Org.(1)
EBITDA	380	267	-29.7	-22.9
o/w Belgium <sup>(2)</sup>	247	125	-49.4	-42.9
o/w Brazil	115	143	+24.3	+32.2

#### Belgium<sup>(2)</sup>

- Wind: production down -11.1%, in line with less favourable wind conditions than in 2020, despite the increase in installed capacity to 591MW<sup>(3)</sup> (+7.8% vs. end-2020)
- Electricity buybacks against a backdrop of very sharp commodity price increases at the end of the year
- **Thermal**: increased output thanks to better availability and an increase in service provided to the electric system

#### Brazil

 Increase in November 2020 of the tariff for electricity sales (PPA) for EDF Norte Fluminense and selling on spot markets at high prices





ACQUISITION OF A PORTFOLIO (5) OF AROUND 330,000 CUSTOMERS (ESSENT BELGIUM - GAS & ELECTRICITY) IN BELGIUM

- 1) Organic change at comparable scope, standards and exchange rates.
- (2) Luminus and EDF Belgium.

- (3) Net capacity at Luminus scope. 658MW in gross capacity (11.9% growth vs. end-2020).
- See EDF press releases dated 9 August 2021
- (5) See the Luminus press release of 3 May 2021.



### **CHANGE IN COMMODITIES (1) VOLATILITY**

In millions of euros	2020	2021	Δ
France – Generation and supply activities	(108)	(100)	8
France – Regulated activities	1	(1)	(2)
United Kingdom	18	1	(17)
Italy	(3)	(10)	(7)
Dalkia	-	(8)	(8)
Other activities	(83)	(97)	(14)
Total Group (2)	(175)	(215)	(40)

<sup>(2)</sup> The segments Other international, Framatome and EDF Renewables are not concerned



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<sup>(1)</sup> Net changes in fair value of energy and commodity derivatives, excluding trading activities

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#### FROM EBITDA TO EBIT (1) IN 2021

In millions of euros	TOTAL GROUP	France – Generation and supply activities	France – Regulated activites <sup>(2)</sup>	Framatome	UK	ltaly	Other International	EDF Renewables	Dalkia	Other Activities
EBITDA	18,005	7,394	5,992	310	(21)	1,046	267	815	378	1,824
Commodities volatility	(215)	(100)	(1)	-	1	(10)	-	-	(8)	(97)
Net depreciation and amortisation	(10,789)	(4,449)	(3,381)	(291)	(1,071)	(422)	(305)	(520)	(281)	(69)
(Impairment) / reversals	(653)	(24)	-	(5)	(713)	149	-	(54)	(5)	(1)
Other operating income and expenses	(1,123)	(427)	-	(23)	(212)	(155)	(437)	-	133	(2)
EBIT	5,225	2,394	2,610	(9)	(2,016)	608	(475)	241	217	1,655

<sup>(2)</sup> Regulated activities: Enedis, ES and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code



<sup>(1)</sup> Contribution to the group

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#### **CHANGE IN FINANCIAL RESULT**

In millions of euros	2020	2021	Δ
Cost of gross financial debt	(1,610)	(1,459)	151
o/w interest expenses on financing operations	(1,699)	(1,494)	205
Discount expenses (1)	(3,733)	(2,670)	1,063
Other financial income and expenses	2,761	4,489	1,728
o/w gains on dedicated assets disposals	162	41	(121)
o/w net change in fair value of debt and equity instruments of dedicated assets	1,218	2,739	1,521
Financial result	(2,582)	360	2,942
Excluding non-recurring items before tax (change in IFRS 9 fair value of financial instruments)	(1,123)	(2,797)	(1,674)
Current Financial result	(3,705)	(2,437)	1,268

(1) Including the impact of the decrease in the discount rate of nuclear provisions in France in 2020



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# FROM INTEREST CHARGES ON FINANCING ACTIVITIES TO NET FINANCIAL EXPENSES DISBURSED

In millions of euros	2020	2021	Δ	
Interest charges on financing activities	(1,699)	(1,494)	205	
Accrued interest	(86)	(69)	17	
Other financial income and charges (including dividends)	856	975	119	
Net financial expenses disbursed	(929)	(588)	341	

<sup>(1)</sup> The published figures for 2020 include a €79 million reclassification in « Net financial expenses disbursed » : (30) in « Dedicated assets » and (49) in « Other non-monetary changes »



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#### **NET INCOME EXCL. NON-RECURRING ITEMS**

In €m	2020 current	2020 non current	2020	2021 Current	2021 non current	2021
EBITDA	16,174	-	16,174	18,005	-	18,005
Commodities volatility	-	175	(175)	-	215	(215)
Amortisation/depreciation expenses and provisions for renewal	(10,568)	270	(10,838)	(10,789)	-	(10,789)
Impairments and other operating income and expenses	-	1,286	(1,286)	-	1,776	(1,776)
EBIT	5,606	1,731	3,875	7,216	1,991	5,225
Financial result	(3,705)	(1,123)	(2,582)	(2,437)	(2,797)	360
Income tax	(361)	584	(945)	(1,019)	381	(1,400)
Share of net income from associates and joint-ventures	547	122	425	787	143	644
Net income of discontinued operations	(41)	117	(158)	(1)	-	(1)
Deduction net income from minority interests	77	112	(35)	(171)	114	(285)
Net income – Group share	1,969	1,319	650	4,717	(396)	5,113



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#### SHARE IN NET INCOME OF ASSOCIATES AND JOINT VENTURES

In millions of euros	2020	2021	Δ
CTE/RTE	237	307	70
CENG	63	131	68
Other (1)	125	206	81
TOTAL	425	644	219

<sup>(1)</sup> Mainly Jera Trading, NTPC, CES (Companhia Energética Sinop SA), Jiangxi Datang International Fuzhou Power Generation Company Ltd and different companies owned by EDF Renewables and EDF SA



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#### **NET INCOME FROM MINORITY INTERESTS**

In millions of euros	2020	2021	Δ
Framatome	(26)	(22)	4
United Kingdom	(92)	(312)	(220)
Italy	11	30	19
Other international	3	(27)	(30)
EDF Renewables	39	(4)	(43)
Other	30	50	20
TOTAL	(35)	(285)	(250)



#### **CHANGE IN NET FINANCIAL DEBT**

In millions of euros	2020 (1)	2021
EBITDA	16,174	18,005
Cancellation of non-monetary items included in EBITDA	328	(869)
EBITDA Cash	16,502	17,136
Change in net WCR	(1,679)	(1,526)
Net investments – excluding disposals 2020-2022 (2)	(14,145)	(15,725)
Dividends received from associates and joint ventures	433	467
Other elements	(450)	(565)
Operating Cash Flow	661	(213)
Assets disposals	187	2,847
Income taxes paid	(983)	(2,276)
Net financial expenses	(929)	(588)
Dedicated assets	(828)	(501)
Dividends paid in cash	(768)	(794)
Group Cash Flow	(2,660)	(1,525)
Other monetary changes	2,194	192
Change in net financial debt	(466)	(1,333)
Effects of change and exchange rates	445	(515)
Other non-monetary changes – IFRS 16	(574)	(712)
Other non-monetary changes	(552)	1,862
Change in net financial debt from continuing operations	(1,147)	(698)
Change in net financial debt from discontinued operations	(10)	-
Net Financial Debt – Opening balance	41,133	42,290
Net Financial Debt – Closing balance	42,290	42,988

<sup>(1)</sup> The published figures for 2020 include a  $\in$ 79 million reclassification in « Net financial expenses disbursed » : (30) in « Dedicated assets » and (49) in « Other non-monetary changes »

<sup>(2)</sup> Including Linky and HPC

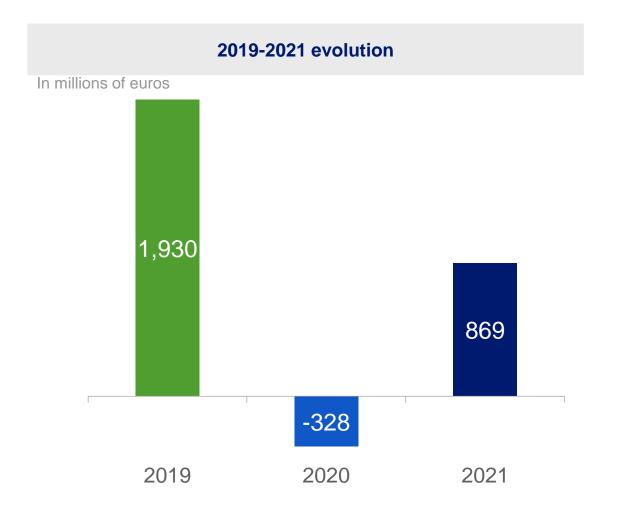


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#### **EBITDA NON-CASH ITEMS**



#### **Main items**

- Fair value adjustments (significant variation of the fair value of EDF Trading between 2019 and 2020 and between 2020 and 2021)
- Significative gains or losses on assets disposals in 2019 (NNG)
- Changes in provisions (nuclear provisions, employee benefits, other provisions recorded in EBITDA)



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#### **NET INVESTMENTS**

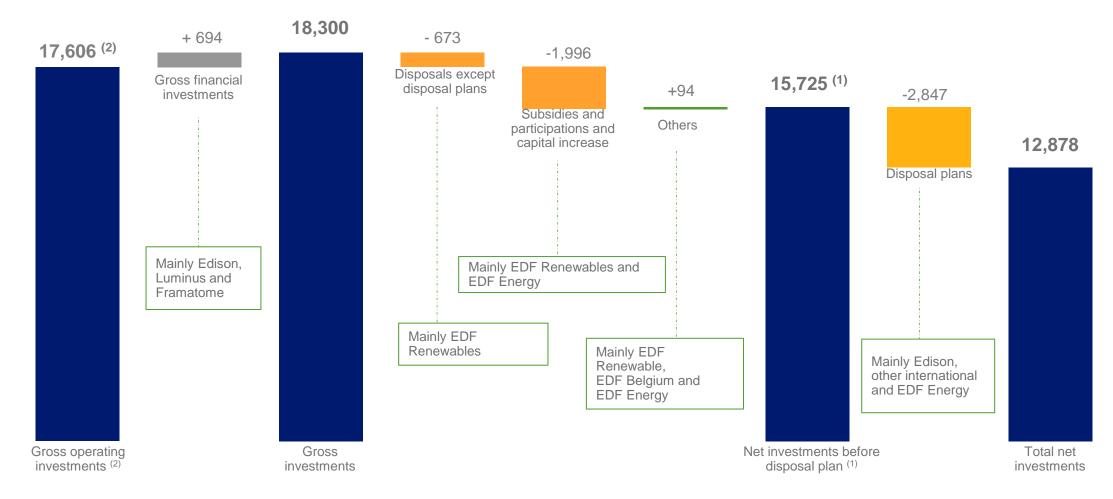
In millions of euros	2020	2021	Δ	Δ %
France – Generation and supply activities	5,484	5,338	(146)	(3)
France – Regulated activities	4,049	4,617	569	14
Framatome	219	381	162	74
United Kingdom	2,625	3,054	428	16
Italy	531	909	379	71
Other international	207	289	81	39
EDF Renewables	812	853	41	5
o/w Gross investment	1,852	1,928		
o/w Disposals and subsidies	1,040	1,075		
Dalkia	180	284	104	58
Other activities	38	-	(38)	(100)
Total net investments, excluding assets disposal plan	14,145	15,725	1,580	11
Group assets disposal plan	(187)	(2,847)	(2,661)	1,427
NET INVESTMENTS	13,959	12,878	(1,081)	(8)



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#### **INVESTMENTS: FROM GROSS TO NET (1)**

In millions of euros



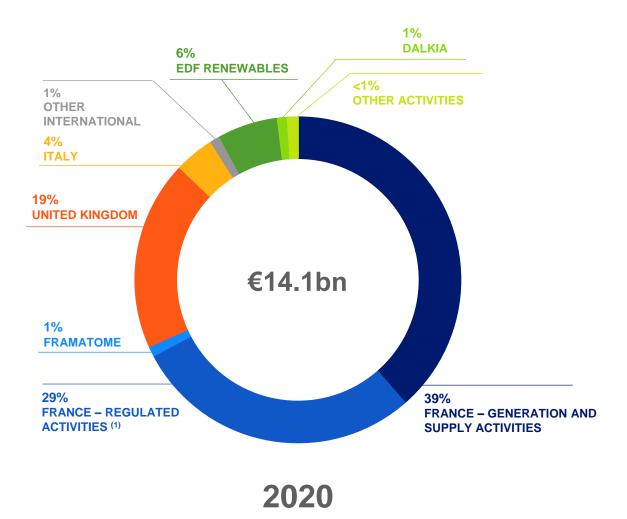
<sup>(1)</sup> Net investments in the Change in NFD statement including Linky, HPC and excluding disposal plan

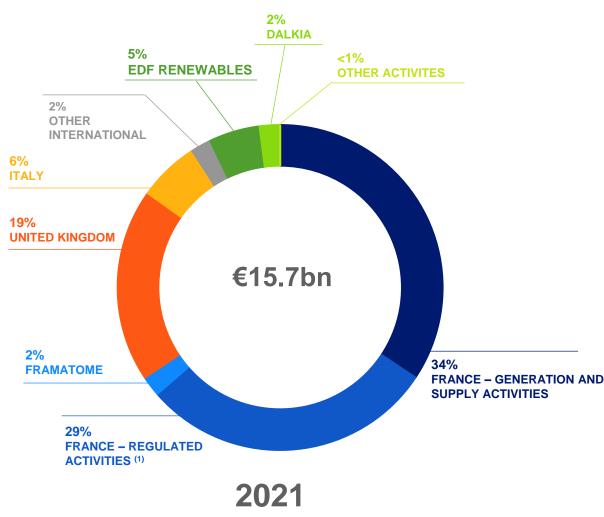
<sup>2)</sup> Investments in intangible assets and property, plant and equipment in consolidated cash flow statement



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#### NET TOTAL INVESTMENTS INCLUDING ACQUISITIONS EXCLUDING DISPOSAL PLAN



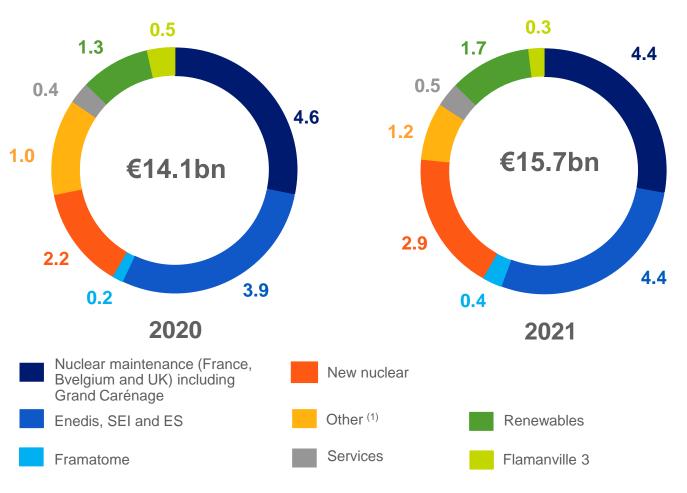




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#### NET INVESTMENTS INCLUDING ACQUISITIONS EXCLUDING DISPOSAL PLAN

In billions of euros



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 (1)	0.4	0.7	1.2
TOTAL	7.1	8.6	15.7

NB: figures rounded up to the nearest decimal number

(1) Mainly thermal maintenance, gas, property, central functions,



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#### **SIMPLIFIED BALANCE SHEET**

ASSETS (in millions of euros)	31/12/2020	31/12/2021
Intangible and tangible assets	179,658	188,416
Other non-current assets	57,574	67,452
Non-current assets	237,232	255,868
Inventories and trade receivables	29,259	38,432
Other current assets	30,834	56,678
Cash and cash equivalents	6,270	9,919
Current assets	66,363	105,029
Assets held for sale	2,296	69
Total assets	305,891	360,966

LIABILITIES (in millions of euros)	31/12/2020	31/12/2021
Equity (EDF's share)	45,633	50,211
Equity (non-controlling interests)	9,593	11,778
Total equity	55,226	61,989
Non-current provisions	85,837	89,225
Special distribution concession liabilities	48,420	48,853
Non-current other liabilities	63,888	63,760
Non current liabilities	198,145	201,838
Current liabilities	52,412	97,109
Liabilities related to assets classified as held for sale	108	30
Total liabilities	305,891	360,966



Consolidated financial statements

### **GOODWILL**

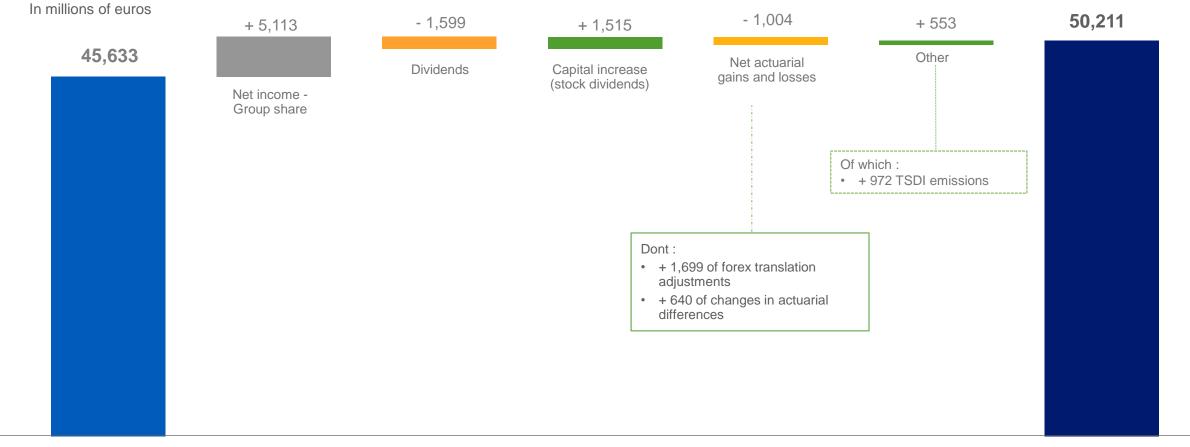
In millions of euros	31/12/2020	31/12/2021	Δ
EDF Energy <sup>(1)</sup>	7,569	8,095	526
Framatome	1,332	1,428	96
Dalkia	572	592	20
Other	792	830	38
TOTAL	10,265	10,945	680

<sup>(1)</sup> Variation mainly linked to the foreign currency adjustments



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#### **GROUP SHAREHOLDERS' EQUITY**



Shareholders' equity as of 31/12/2020

Shareholders' equity as of 31/12/2021



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## **GROUP PROVISIONS**

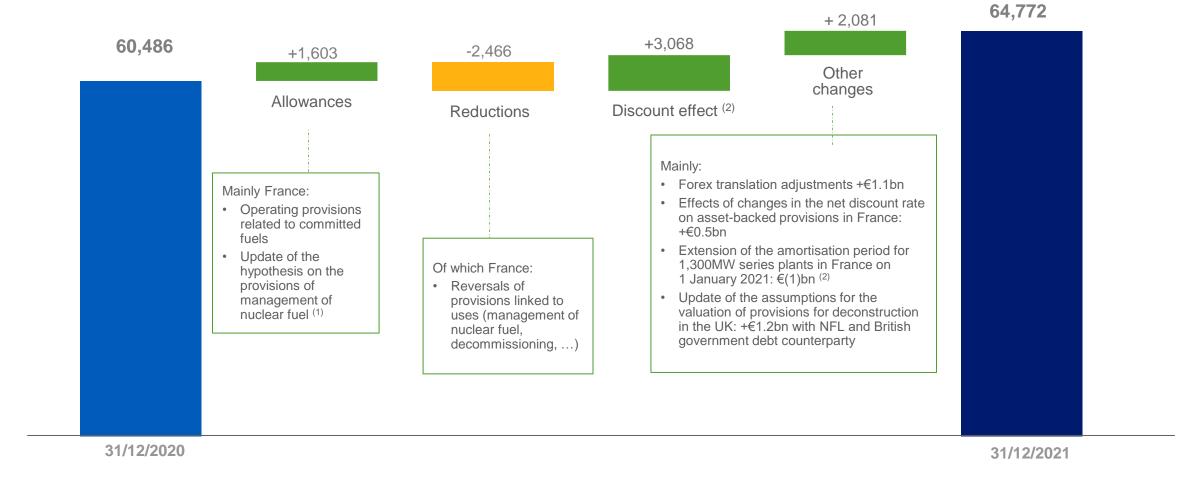
	31 December 2020			31 December 2021			
In millions of euros	Current	Non Current	Total	Current	Non Current	Total	
Provisions for back-end nuclear cycle	1,430	26,137	27,567	1,359	28,155	29,514	
Provisions for nuclear decommissioning and last cores	723	32,196	32,919	1,346	33,912	35,258	
Other provisions for decommissioning	120	1,744	1,864	95	1,872	1,967	
Provisions for employee benefits	879	22,130	23,009	791	21,716	22,507	
Other provisions	2,675	3,630	6,305	3,245	3,570	6,815	
Total Provisions	5,827	85,837	91,664	6,836	89,225	96,061	



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#### **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 (NLF) and the British Government leading to an effect on the income statement

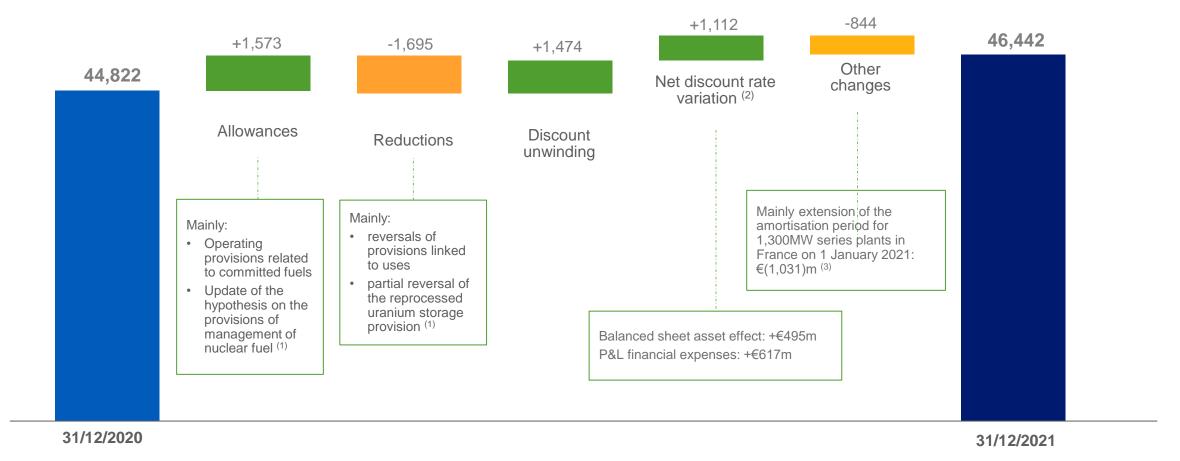
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#### FRANCE NUCLEAR PROVISIONS

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



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#### **FRANCE NUCLEAR PROVISIONS**

In millions of euros	31/12/2020	Net allowances	Discount effect	Other changes (1)	31/12/2021
Total provisions for back-end nuclear cycle	24,622	(198)	1,359	269	26,052
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
Total provisions for nuclear dismantling and last cores	20,200	76	732	(618)	20,390
Provisions for dismantling power stations	17,489	76	649	(484)	17,730
Provisions for last cores	2,711	-	83	(134)	2,660
TOTAL FRANCE NUCLEAR PROVISIONS	44,822	(122)	2,091	(349)	46,442

NB: Regarding the allocation to Dedicated Assets for nuclear provisions coverage, please refer to the slide "Dedicated Assets" on p.123 (1) Other changes include changes in asset-backed provisions. These changes are not included in the income statement.

Consolidated financial statements

## **DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (1/5)**

	December 2020	December 2021
Regulatory ceiling rate – real	2.7% (1)	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



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## **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



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## **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) (1);
  - 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)

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<sup>(1)</sup> 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 (1) to a 0.1% decrease in the real discount rate (excluding the corresponding tax effect) would be:
  - For balance sheet provisions: €1,073m (2) (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 (3)
  - 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

No need to allocate once the coverage rate reaches 100%



<sup>(1)</sup> As published in the consolidated financial statements at 31 December 2021

<sup>(2)</sup> Including €462M recorded against assets

# 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			
For a variation of 10 base points	Provisions (discounted value)		On balance sheet provisions		e-tax ngs
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)
o/w part of the coverage base for dedicated assets	34,276	(917)	963	515	(548)



# 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 (1), 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 (2)	and characterize a number national (for example in Fra	of factors that could distort direct c nce, this includes the number of plant	rtake an international comparison to back omparisons. These include differences in s) and regulatory contexts. iew which, in 2017, 2018, 2019 and 2020 r	the scope of the estimates or in the	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.
	Update to the industrial dismantling scenario for GCR reactors (3):	Update of the evaluation of		GCR	(3): Annual estimate review → non-mat	erial adjustments	
Decommis- sioning costs closed plants	Scenario for GCR reactors (a):  ✓ Dismantling of the caissons (reactor buildings) in the open air, and no longer under water  ✓ Lessons learned from dismantling a first caisson before commencing operations on the five others  Provisions increased by €0.3 billion	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.	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	air, advantage of industrial demonstrator and the schedule for the first dismantled reactor (Chinon A2) seem to be approved.  Discussions continue on the	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 (4) by the Ministerial Order (1), which substitutes the 2005 estimated benchmark cost of €20.8bn on which EDF group used to rely. €0.8bn increase in provision		esign 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	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.		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

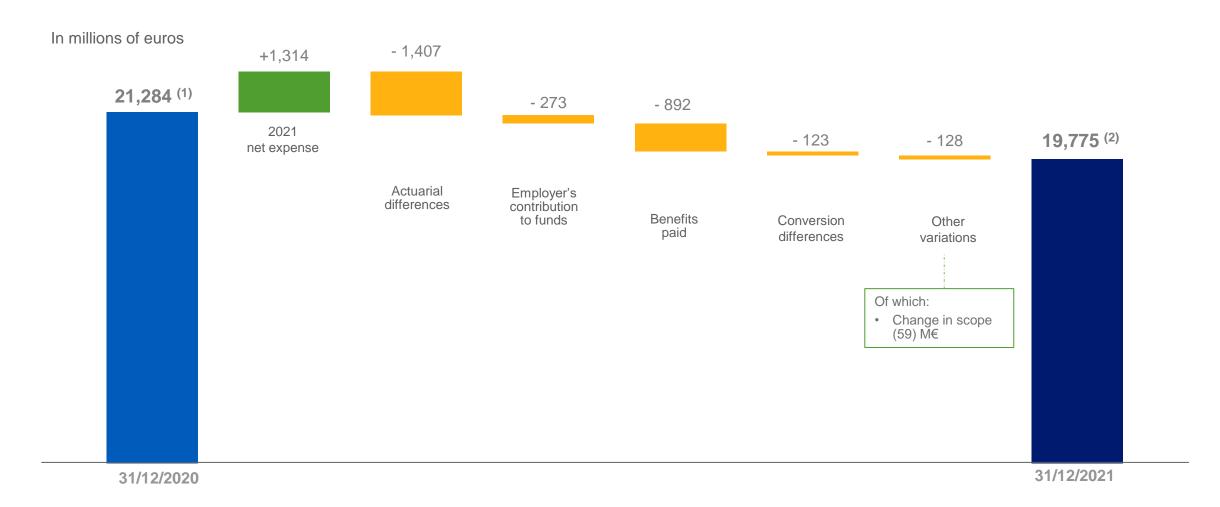


- (1) Please refer to the release from the French Ministry for Ecology, Sustainable Development and Energy from 15 January 2016
- (2) Lower provision for counterparty of underlying assets

- (3) GCR: Gas-cooled reactor
- (4) At the economic conditions of 2011
- (5) Safety Operations Record « Dossier sur les Opérations de Sûreté »

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## **GROUP PROVISIONS FOR EMPLOYEE BENEFITS: CHANGE IN NET LIABILITY**



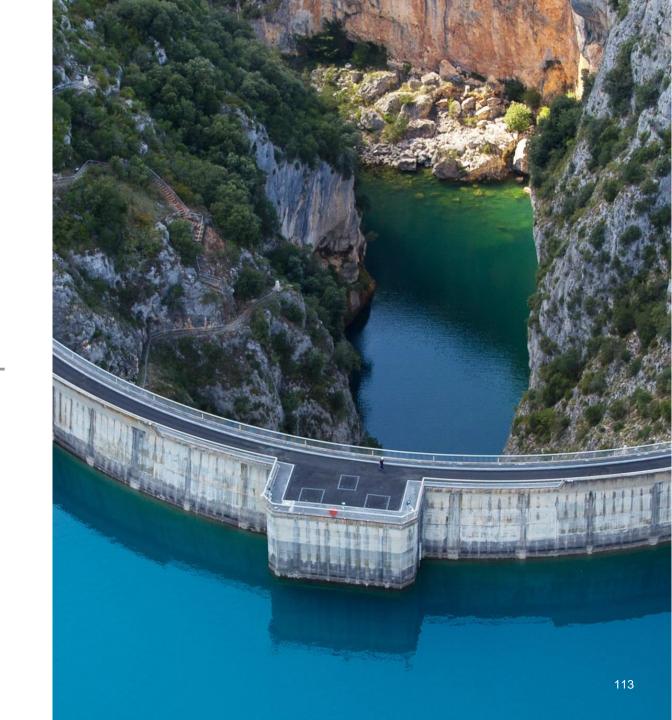
<sup>(1)</sup> Including: provisions for employee benefits €23,009m and non-current financial assets €(1,725)m

<sup>(2)</sup> Including: provisions for employee benefits €22,508m and non-current financial assets €(2,733)m



# **2021 ANNUAL RESULTS**

FINANCING AND CASH MANAGEMENT



# **DEBT AND LIQUIDITY**

In billions of euros	31/12/2019	31/12/2020	31/12/2021
Net financial debt	41.1	42.3	43.0
Net financial debt/EBITDA	2.46x	2.61x	2.39x
Debt			
<ul><li>Bonds</li></ul>	52.4	50.2	49.2
<ul> <li>Average maturity of gross debt (in years)</li> </ul>	15.4	14.5	13.7
Average coupon	2.69%	2.32%	2.06%
Gross liquidity (1)	33.4	32.4	35.7

<sup>(1)</sup> With cash and cash equivalents, liquid assets, and undrawn lines of credit



# **NET FINANCIAL DEBT**

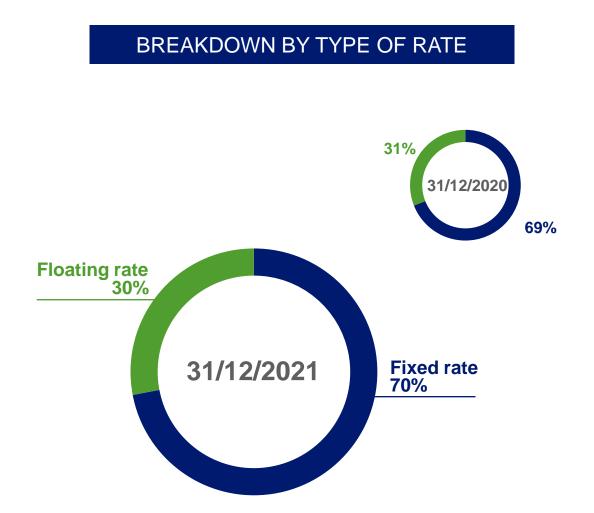
In millions of euros	31/12/2019 <sup>(1)</sup>	31/12/2020 (1)	31/12/2021 (1)
Financial debt	67,380	65,591	69,406
Derivatives used to hedge debt	(3,387)	(1,986)	(3,762)
Cash and cash equivalents	(3,934)	(6,270)	(9,919)
Liquid financial assets available for sale	(18,900)	(15,028)	(12,737)
Net financial debt reclassified (IFRS 5) (2)	(26)	(17)	-
Net financial debt	41,133	42,290	42,988

<sup>(2)</sup> After disposal of Edison's E&P

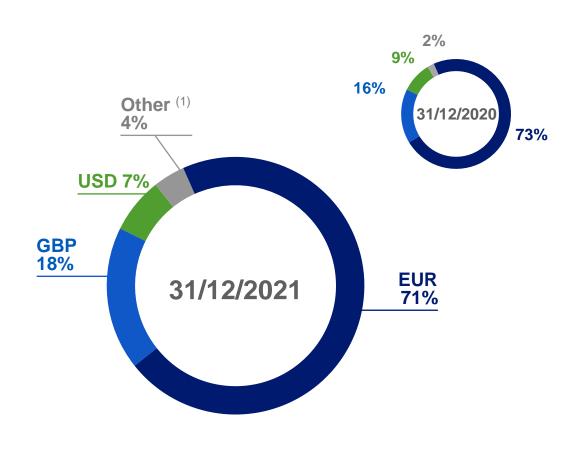


<sup>(1)</sup> After application of IFRS 16

# **GROSS FINANCIAL DEBT AFTER SWAPS**



## **BREAKDOWN BY CURRENCY**



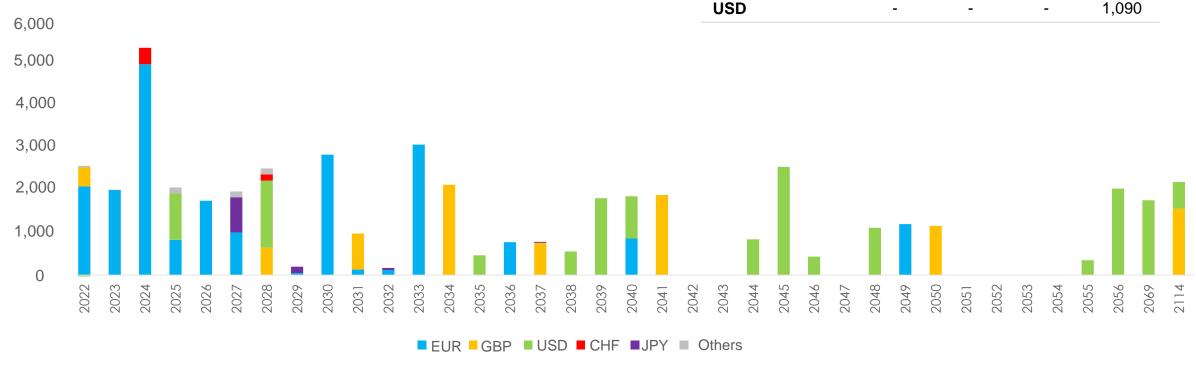
(1) Mainly CHF, PLN, CAD and JPY



# **BREAKDOWN OF BOND DEBTS BY CURRENCY**

In millions of euros, before swaps

Including	2022	2023	2024	2025
(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	Currency	Coupen
issue uale V	Maturity	(in millions of currency units)	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%
10/2015	10/2025	1,250	USD	3.63%
11/2010	11/2025	750	EUR	4.00%
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



Green Bond

Green Bond

# MAIN OUTSTANDING BONDS AS OF 31 DECEMBER 2021 (2/2)

Green Bond

Issue date <sup>(1)</sup>	Maturity	Nominal amount	Currency	Coupon
issue date ' '	Waturity	(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%



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# **FOCUS ON HYBRIDS SECURITIES**

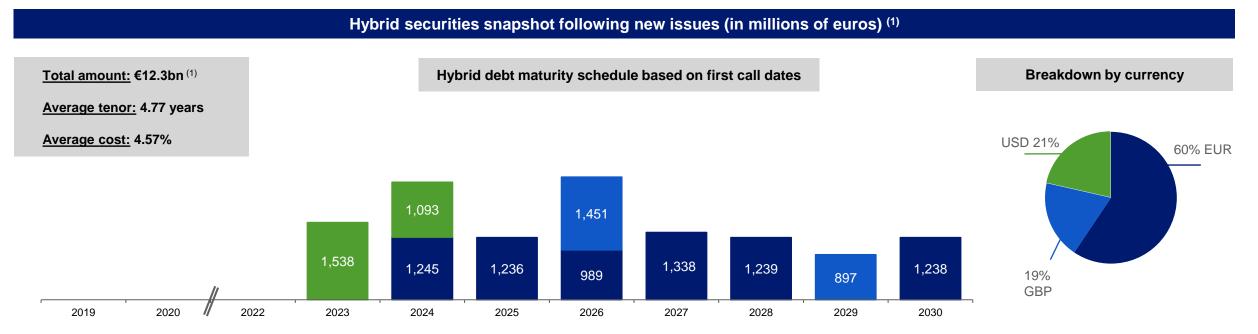
#### Hybrid issue



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%

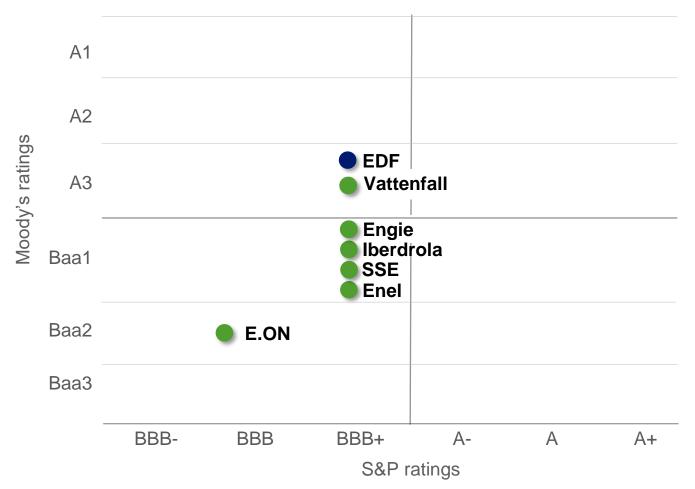
These issues allowed to extend the maturity of the stock of hybrids and to reduce the average coupon



(1) Exchange rate as of transaction time



# **COMPARATIVE CREDIT RATINGS**



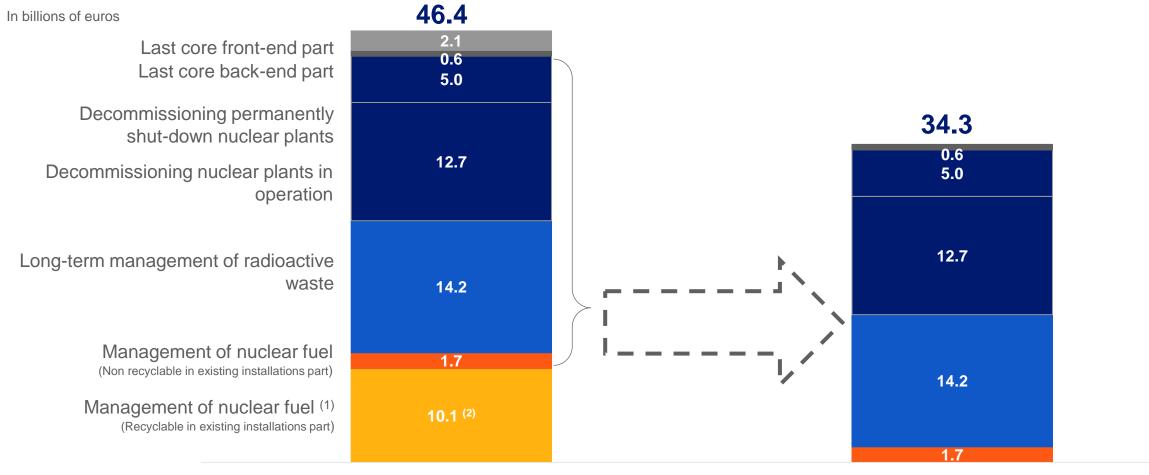
	S&P ratings	Moody's ratings	Fitch ratings
EDF	BBB+ stable <sup>(1)</sup>	A3 stable <sup>(2)</sup>	BBB+ negative <sup>(3)</sup>
Engie	BBB+ stable	Baa1 stable	A- stable
Vattenfall	BBB+ positive	A3 stable	n.d.
SSE	BBB+ stable	Baa1 stable	BBB stable
Iberdrola	BBB+ stable	Baa1 stable	BBB+ stable
Enel	BBB+ stable	Baa1 stable	BBB+ stable
E.ON	BBB stable	Baa2 stable	BBB+ stable
Uniper	BBB stable	n.d.	n.d.
RWE	n.d	Baa2 stable	BBB+ stable

Sources: rating agencies as of 17/02/2022

- (1) Update of the rating and outlook of EDF Group by S&P on 8 February 2022
- (2) Update of the rating and outlook of EDF Group by Moody's on 17 January 2022
- (3) Update of the rating and outlook of EDF Group by Fitch on 17 January 2022



# PROVISIONS RELATED TO NUCLEAR GENERATION IN FRANCE PART TO BE COVERED BY DEDICATED ASSETS



Total provisions related to nuclear generation in France

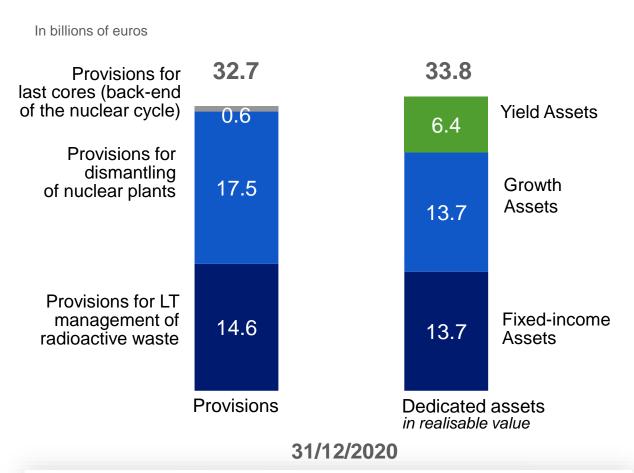
Long-term provisions related to nuclear generation in France to be covered by DA

122

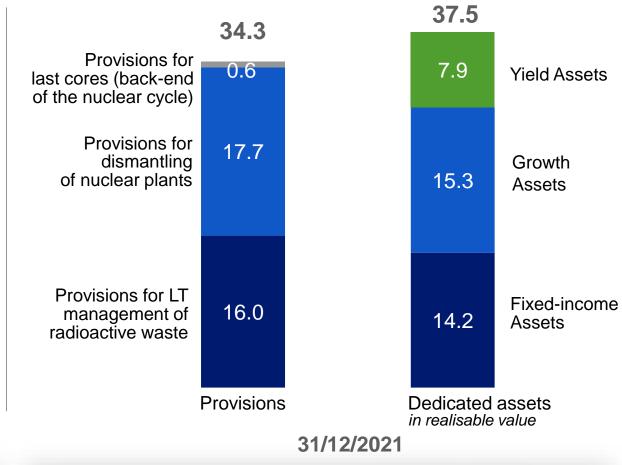
(1) Related to the operating cycle

Of which €1.1bn Management of nuclear fuel, excluding law

## **EDF SA DEDICATED ASSETS**



• 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)

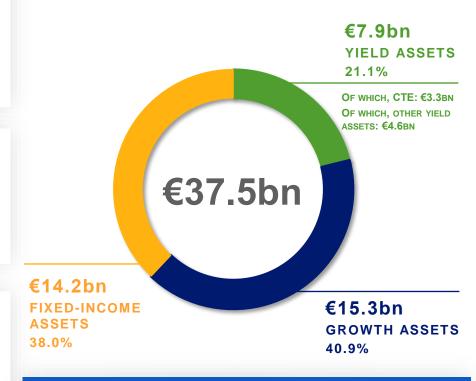
YIELD ASSETS: +17.1% Yield assets comprise **property** and **infrastructure assets**. In 2021, they generated a performance of 17.1%, composed of **dividends received** and the change in the realisable value of investments during the year. This solid performance resulted from **effective sector and geographical diversification** 

GROWTH ASSETS: +22.6%

As a result of the equity market rise, the growth-asset component gained 22.6%, driven primarily by **investments in developed countries**. 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 **government loans remained at exceptionally low levels**. In addition, the **strong performance of credit markets**, the **selection** and **reduced sensitivity** of the portfolio served to **limit the decline** in value. Some components, including subordinated bank bonds and the *High-Yield* credit, turned in a largely positive performance.



**2021 PERFORMANCE: 11.9%** (1)

Performance +6.5% on an annualised basis since early 2004

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(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

# MANAGEMENT OF DEDICATED 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

# ... FOR A DIVERSIFIED PORTFOLIO

- 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

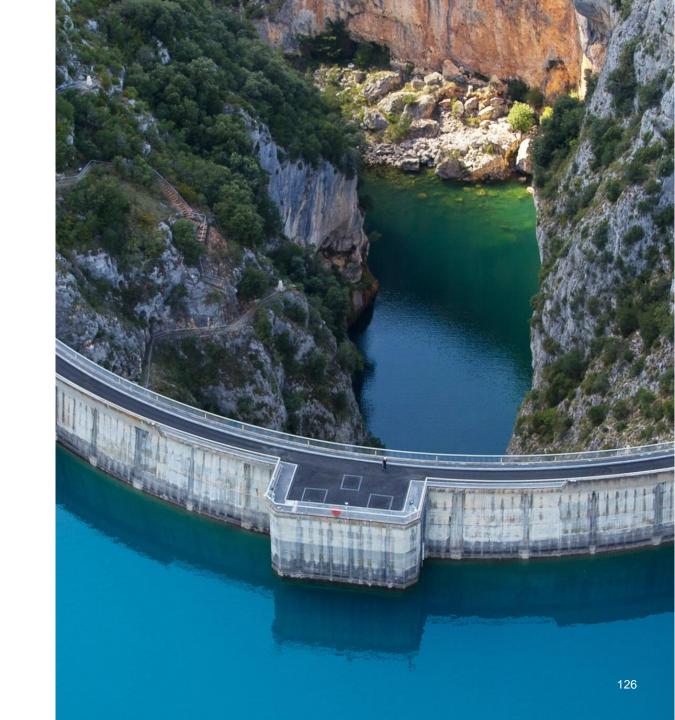


(1) Including CTE for €3.3bn



# **2021 ANNUAL RESULTS**

OPERATIONAL DATA & MARKETS



# **INSTALLED CAPACITY AS OF 31 DECEMBER 2021**

(in GW)	Total net capacities of E including shares in ass joint ventures	ociates and	Investments in associates and joint ventures	Consolidated ca of EDF Gro	-
Nuclear (1)	69.5	56 %	-0.6	70.1	60 %
Hydro (2)	22.5	18 %	1.0	21.5	18 %
ENR	12.2	10 %	2.9	9.3	8 %
Gas	11.0	9 %	0.2	10.8	9 %
Fuel oil	3.7	3 %	0.2	3.5	3 %
Coal (3)	4.2	3 %	2.0	2.2	2 %
Total	123.2	100 %	5.8	117.3	100 %

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

<sup>(3)</sup> Taking into consideration the shutdown of Le Havre coal power plant and the units 3 and 4 of the West Burton A plant in the UK



<sup>(1)</sup> Taking into consideration the shutdown of Dungeness B nuclear power plant in the UK and the disposal of CENG

<sup>(2)</sup> Including sea energy: 0.24GW

# **ELECTRICITY OUTPUT**

Output from fully consolidated entities

(in TWh)	20	2020		21
Nuclear	384.1	76.5 %	409.8	78 %
Hydro <sup>(1)</sup>	49.4	9.8 %	46.2	9 %
ENR	19.3	3.8 %	20.9	4 %
Gas	42.0	8.4 %	38.0	7 %
Fuel oil	5.0	1.0 %	5.1	1 %
Coal	2.2	0.4 %	3.5	1 %
Group	501.9	100 %	523.7	100 %

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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# **HEAT OUTPUT**

#### Output from fully consolidated entities

(in TWh)	2020	)	2021	
ENR (1)	8.6	33 %	7.9	29 %
Gas	15.6	60 %	17.9	65 %
Fuel oil	0.2	1 %	0.2	1 %
Coal	0.9	3 %	0.9	3 %
Others (2)	0.8	3 %	0.5	2 %
Group	26.1	100 %	27.5	100 %

<sup>(2)</sup> Category combining part of the heat generation by incineration non classified as RE, gas mine and the recovery of heat and electricity from other industrial processes



2021 ANNUAL RESULTS

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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

<sup>(1)</sup> Category corresponding to installations operating with woody biomass, landfill gas, sewage incineration, sewage treatment plant gas and biogases

# **RENEWABLE OUTPUT**

### Output from fully consolidated entities

(in TWh)	2020		202	1
Hydro (1)	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 %
Total electricity Group	68.7	100 %	67.1	100 %
Total heat Group	8.6	100 %	7.9	100 %

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



# CO<sub>2</sub> EMISSIONS (1)

## CO<sub>2</sub> emissions from fully consolidated entities

Emissions from the heat and power	•	In	kt		In g/kWh			
generation by segment	20	20	2021		2020	2021		
France – Generation and supply activities	4,059	15 %	5,708	21 %	10	14		
France – Island regulated activities (2)	3,130	12 %	3,285	12 %	532	515		
Dalkia	5,670	21 %	5,077	19 %	212	186		
United Kingdom	2,980	11 %	1,703	6 %	58	38		
Italy	6,050	22 %	5,778	22 %	277	274		
Other international	5,003	19 %	5,019	19 %	288	233		
Group (3)	26,919	100 %	26,601	100 %	51	48		

<sup>(3)</sup> Framatome contributes to 26kt CO<sub>2</sub> in 2020 and 31kt CO<sub>2</sub> in 2021. The direct CO<sub>2</sub> emissions from "Others activities" segments are not significant compared to Group total emissions



2021 ANNUAL RESULTS

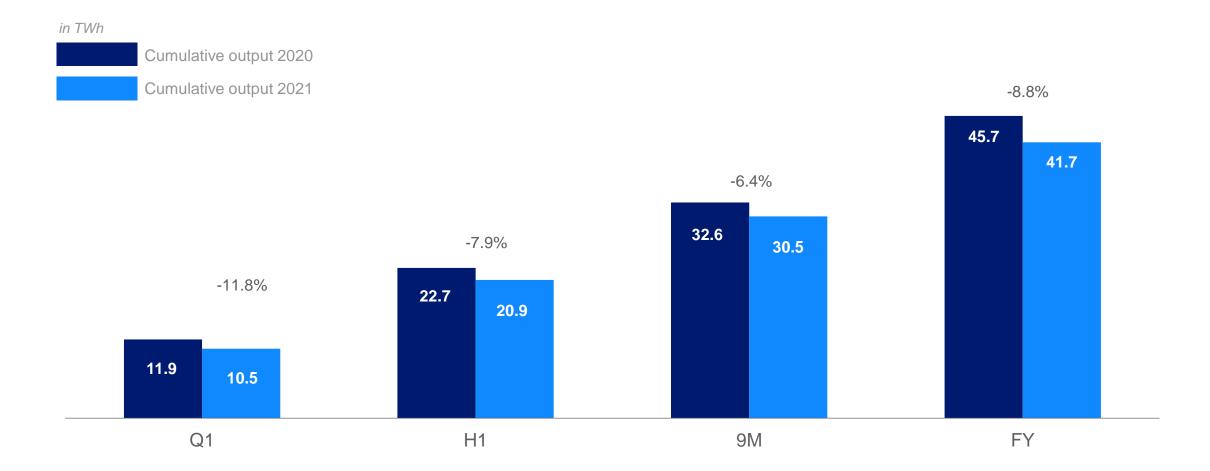
131

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

<sup>(1)</sup> Including direct CO<sub>2</sub> emissions, excluding life cycle analysis (LCA) of fuel and production means

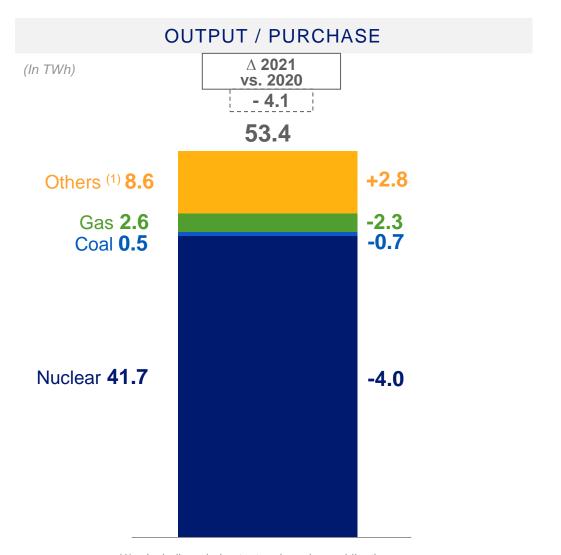
<sup>(2)</sup> Power generation in ZNI: « Zones non interconnectées » corresponding to overseas departments and Corsica - (mainly island territories) and Electricité de Strasbourg (ES)

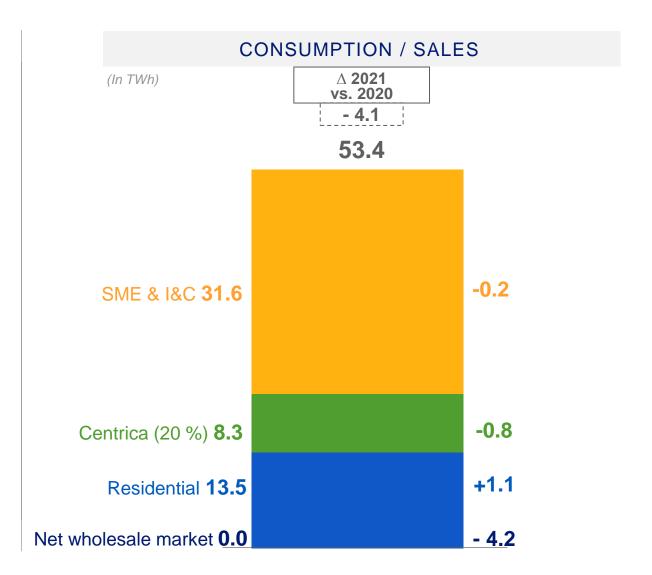
# **UNITED KINGDOM: NUCLEAR OUTPUT**





## UNITED KINGDOM: UPSTREAM / DOWNSTREAM ELECTRICITY BALANCE







(1) Including wind output and purchase obligations

# **GREAT BRITAIN CAPACITY AUCTION RESULTS FOR EDF ENERGY**

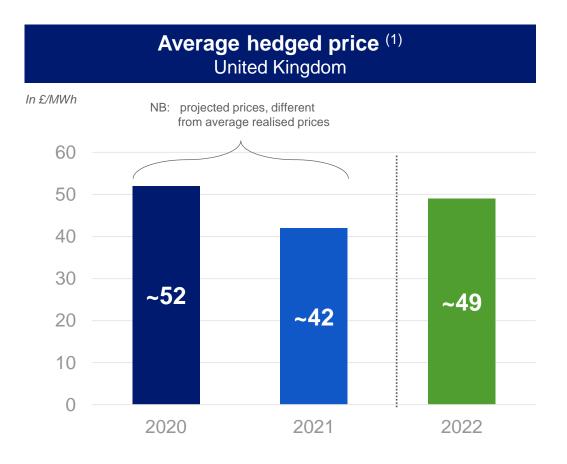
All capacity agreements for 1 year unless otherwise stated	Clearing price £/kW/an	Nuclear	Coal	Demand-side Response (DSR)
2016 Q4 (2020/2021)	22.5 (2015/2016 prices)	All 16 units (7.9GW)	3 of 8 units (1.8GW)	N/A
2018 Q4 (2021/2022)	8.4 (2016/2017 prices)	All 16 units (7.9GW)	0 unit	5 units (32.1MW)
2020 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



## 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 (2)

#### 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.

<sup>(2)</sup> 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.



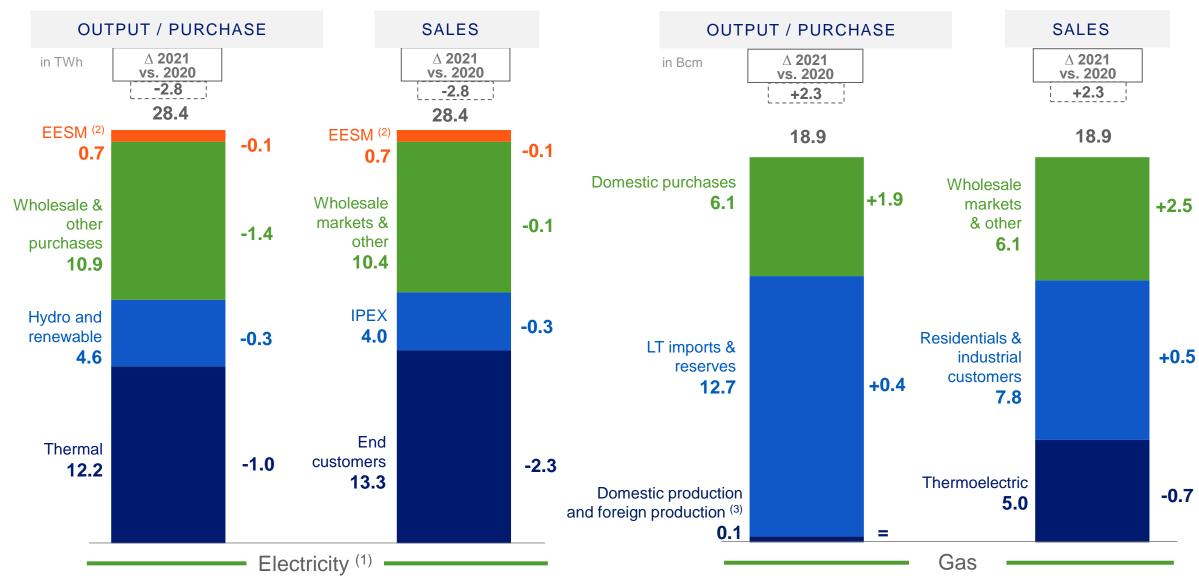
<sup>(1)</sup> Rounded to the nearest whole number. Excluding revenue associated with capacity certificates.

# **UK PLANT FLEET: TIMELINE OF CLOSURES AND SHUTDOWNS**

List of plants	Technology	Planned closure date	Shutdowns
Dungeness	Nuclear	7 June 2021	Decision has been made to move Dungeness B into the defueling phase as of 7/06. Since 2018, the plant was under extended outage to manage a range of unique, significant and ongoing technical challenges. The final electricity generation in 2018 means the plant ran for 10 years longer than original design life and in line with expectations when it was acquired by EDF in 2009.
Hartlepool	Nuclear	2024	
Heysham 1	Nuclear	2024	
Heysham 2	Nuclear	2028	
Hinkley Point B	Nuclear	No later than 15 July 2022	Both reactors are operating their last six-month operating cycle.
Sizewell B	Nuclear	2035 (1)	
Torness	Nuclear	2028	
Hunterston B	Nuclear	7 January 2022	Final shutdown of the two reactors respectively on 26/11/2021 and 07/01/2022
West Burton A	Coal	30 Sept 2022	The station will be available, through two of its four 500MW coal units, will be used for meeting capacity market commitments and could assist with the security of supply. The power plant will be closed by 30 September 2022



## EDISON: UPSTREAM/DOWNSTREAM ELECTRICITY AND GAS BALANCES





Excluding optimisation volumes

EESM Energy & Environmental Services Market Division

Production by Edison Stoccaggio and production relating to the concession in Algeria

## **CAPACITY MECANISM 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

Two auctions were held during 2019 for delivery dates set in 2022 and 2023, and Edison won 3.8GW for 2022 and 3.3GW for 2023 for an annual price of €75,000/MW for new capacities and €33,000/MW for existing capacities

Edison did not participate in any auction in 2021

#### **OUTLINE**

This mechanism is based on an auction process organised by TERNA, the Italian transmission grid operator, for each delivery year. Operators of existing and future production or storage units can participate in the auctions

#### FIXED PREMIUM

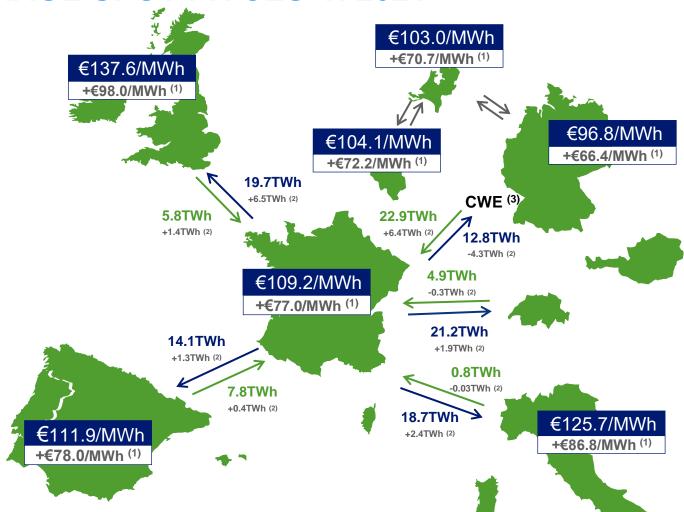
The operators of the capacities selected are paid through a fixed premium during one year for existing capacities and 15 years for future capacities. The fixed premium is paid during the delivery year

# INCENTIVES 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 replay the surplus to TERNA



### **AVERAGE SPOT PRICES IN 2021**



- (1) Change vs average 2020 prices
- (2) Trade (Source: RTE & ENTSO-E Transparency Website) and change vs 2020
- 3) Introduction of flow-based coupling mechanism from 21 May 2015 for the entire CWE (France, Benelux, Germany)

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.

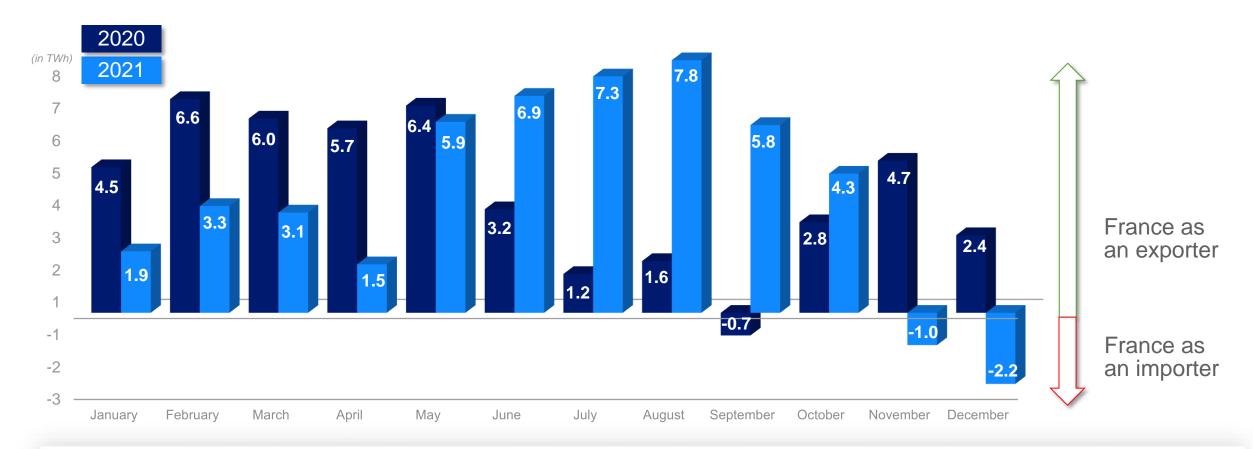
Average observed spot market price for 2021:

- EPEXSPOT: France & Germany
- N2EX: United-Kingdom
- OMIE: Spain
- GME: Italy (Prezzo Unico Nazionale)
- · APX: Netherlands
- BELPEX: Belgium



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## **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 (1) 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



2021 ANNUAL RESULTS

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# FRENCH POWER TRADE BALANCES AT ITS BORDERS

		2020					2021					
(in TWh <sup>(1)</sup> )	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Tota		
	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	8.0	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	
	exports	4.0	4.0	2.2	2.6	12.8	2.6	4.4	5.2	1.8	14.1	
Spain	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	
	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 (2)	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.	
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	



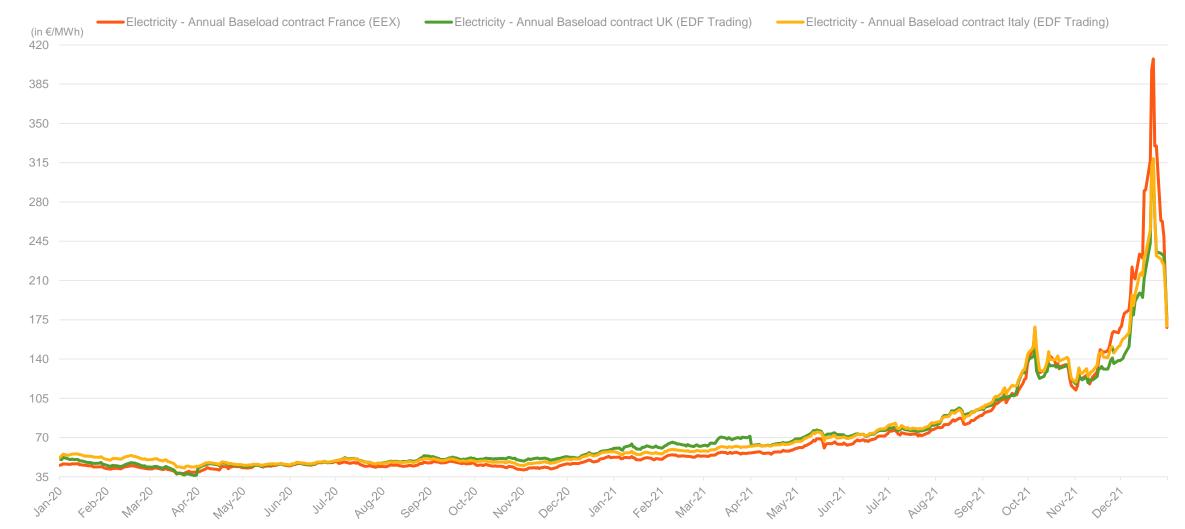
Source: RTE

**2021 ANNUAL RESULTS** 

(2) CWE flow-based coupling zone composed of Germany, Belgium, France, Luxembourg and Netherlands, set up in May 2015

<sup>(1)</sup> Rounded to the nearest tenth

# FORWARD ELECTRICITY PRICES IN FRANCE, THE UK AND ITALY (Y+1) FROM 01/01/2020 TO 31/12/2021



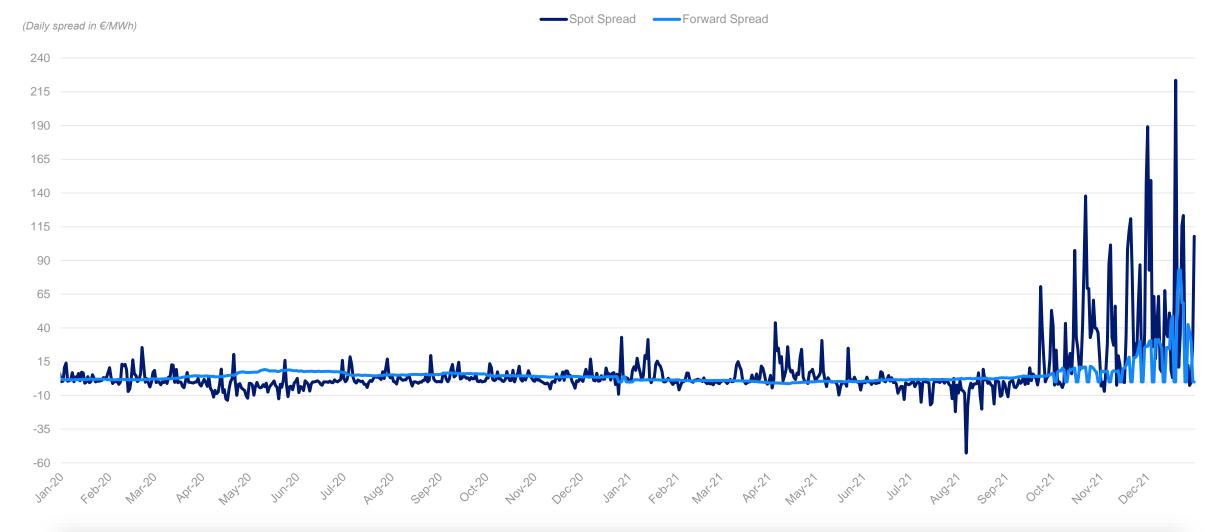


# FORWARD ELECTRICITY PRICES IN FRANCE, THE UK AND ITALY (Y+2) FROM 01/01/2020 TO 31/12/2021





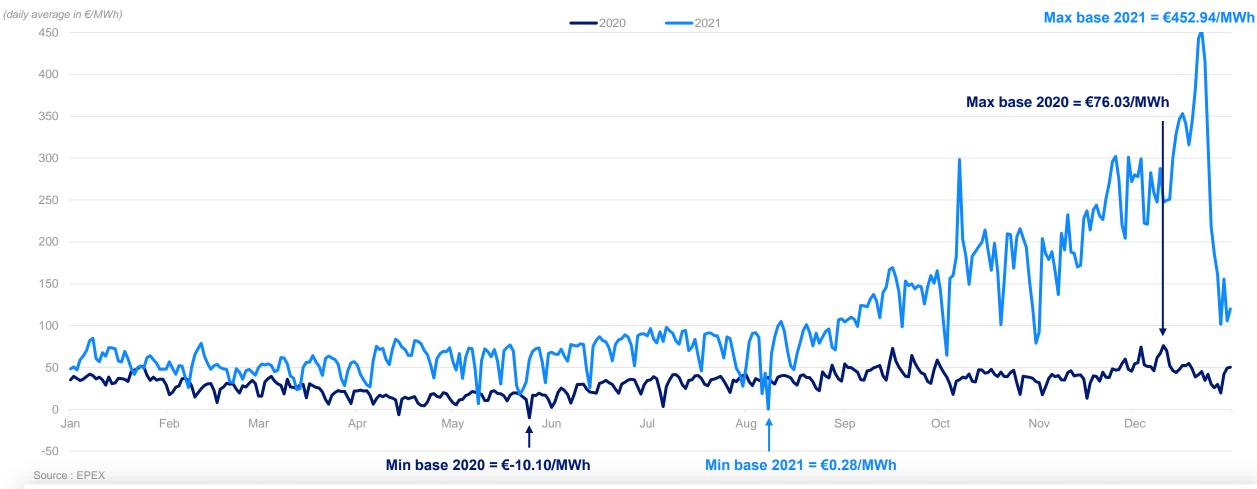
# FRANCE/GERMANY SPREAD FROM 01/01/2020 TO 31/12/2021



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



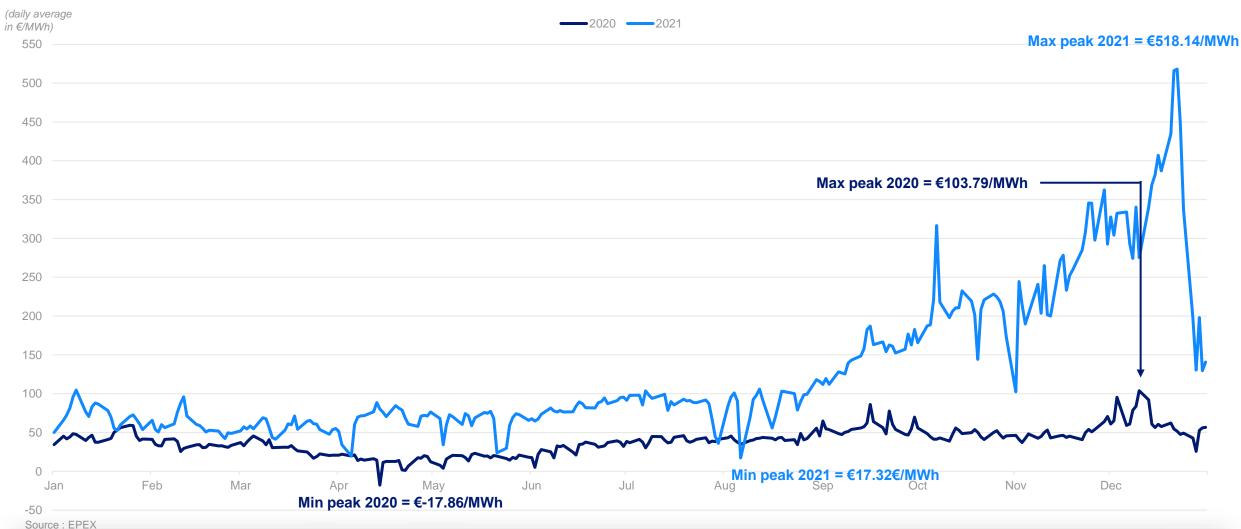
# FRANCE: BASELOAD ELECTRICITY SPOT PRICES



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.



# 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 (1) FROM 01/01/2020 TO 31/12/2021



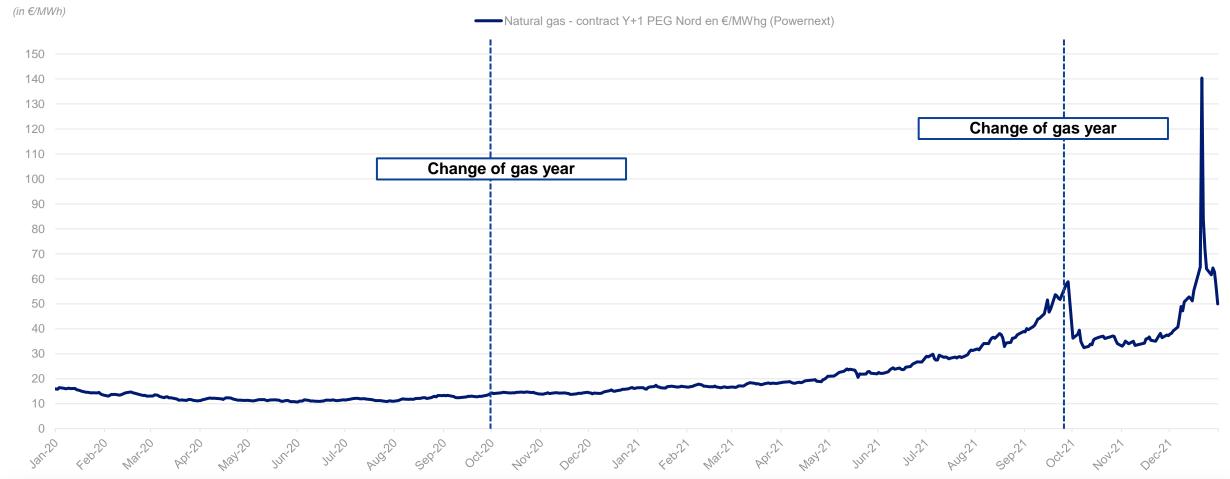
**Oil** prices were up by +64.0% compared to 2020 as demand rose significantly all over the world, driven by the resumption of normal economic activity and introduction of recovery plans in the USA and Europe. The rise in oil prices was limited by the OPEP+ countries' adjustment of production to the IEA's (2) forecast worldwide demand.







# 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



**2021 ANNUAL RESULTS** 

(1) Price of France PEG Nord gas 149



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.

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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.

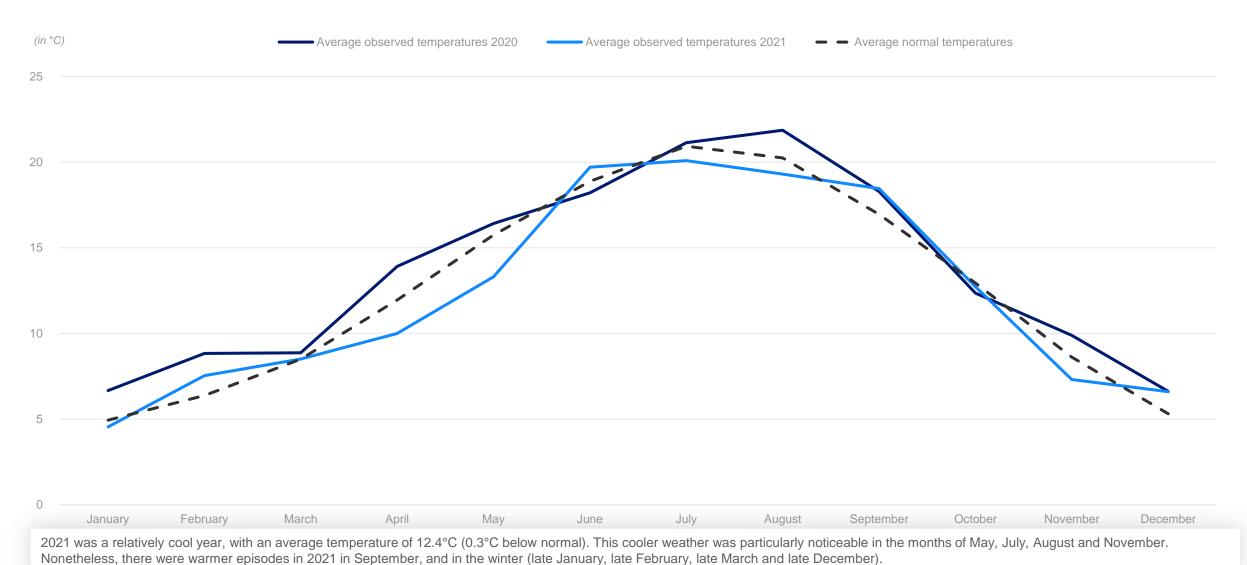
Finally, prices fluctuated with "financial" speculative position-taking, which also contributed to higher volatility in CO<sub>2</sub> quotas.

Because the price of electricity is based on the marginal cost of production, it is sensitive to changes in the price of  $CO_2$  that influence the cost of production of electricity using gas and coal. The sensitivity of the wholesale electricity price in France to the  $CO_2$  price is around  $\in$ 0.5/MWh to  $\in$ 0.6/MWh for  $\in$ 1/tonne of  $CO_2$ 



Operational data and markets

# **AVERAGE MONTHLY TEMPERATURES (1) IN FRANCE**

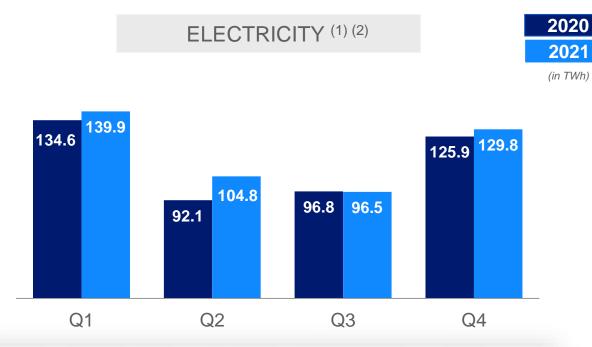


**2021 ANNUAL RESULTS** 

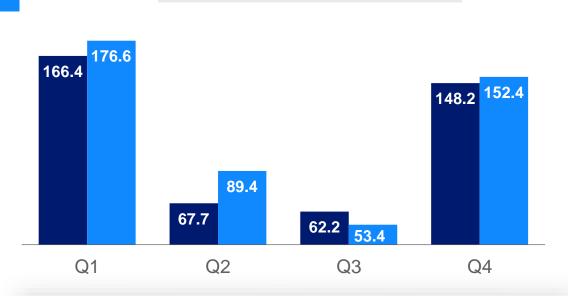
Source: Météo France

Data based on a basket of 32 cities

# FRANCE: ELECTRICITY AND GAS OUTPUT



Electricity consumption in France in 2021 showed a significant increase of 21.6TWh or +4.8% compared to 2020. This increase was mainly due to a weather effect (lower temperatures) of +15TWh, and the economic recovery after the Covid-19 pandemic (+6TWh). However, as 2020 was a leap year, there was a negative effect of 1.4TWh due to 2021 having one day less.



GAS (3)

**Gas consumption** in France rose by 27.3TWh compared to 2020. This rise was principally driven by an increase in demand, except in the third quarter when it declined by 8.8TWh, as average temperatures in the second quarter were 0.3°C below normal and had pushed demand up by 21.7TWh. Also, episode of cold weather (in mid-February and the first fortnight of April) led to peaks in household consumption, while gas consumption by industrial sites was relatively stable

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- (1) Data unadjusted from weather effect and 29 February, including Corsica
- (2) Source 2020-2021: RTE monthly overview december 2021 : ETR + Corsica consumption
- 3) Source: energy monthly data, Service des données et études statistiques, Ministère de la Transition Écologique et Solidaire December 2021 GRT gaz and TEREGA (ex: TIGF)



