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The present document may contain forward-looking statements and targets concerning the Group’s strategy, financial position or results. EDF considers that these forward-looking statements and targets are based on reasonable assumptions as of the present document publication, which can be however inaccurate and are subject to numerous risks and uncertainties. There is no assurance that expected events will occur and that expected results will actually be achieved. Important factors that could cause actual results, performance or achievements of the Group to differ materially from those contemplated in this document include in particular the successful implementation of EDF strategic, financial and operational initiatives based on its current business model as an integrated operator, changes in the competitive and regulatory framework of the energy markets, as well as risk and uncertainties relating to the Group’s activities, its international scope, the climatic environment, the volatility of raw materials prices and currency exchange rates, technological changes, and changes in the economy.

Detailed information regarding these uncertainties and potential risks are available in the reference document (Document de référence) of EDF filed with the Autorité des marchés financiers on 15 March 2019, which is available on the AMF’s website at www.amf-france.org and on EDF’s website at www.edf.fr.

EDF does not undertake nor does it have any obligation to update forward-looking information contained in this presentation to reflect any unexpected events or circumstances arising after the date of this presentation.
BEFORE STARTING…

WHAT’S NEW?

- A focus on the Group’s six corporate social responsibility goals
- A zoom on the Multi-year energy programme in France
- The description of the implementation of CAP 2030 strategic plan projects: Solar Plan, Storage Plan, Electric Mobility Plan, Engagement for continuous CO₂ emissions’ reduction
- And a detailed overview of the EDF Renewables ambitions

Reading suggestions

- To help you understand the terms used, you will find a glossary at the end of the document
- Moreover, you will find throughout the document some “Did you know?” take away boxes, which enlighten a specific content
- Many other information are available in our Reference Document, which you can download under: https://www.edf.fr/en/the-edf-group/dedicated-sections/investors-shareholders/financial-information/regulated-information/reference-documents

Navigation suggestions

- To help you navigate through this document, hypertext links have been incorporated
- Thus, a click on the EDF logo will bring you back to the main table of contents (page 5)
- The name of the chapter can be found at the bottom of each page. A click on the name of the chapter will bring you back to the beginning of this part
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<td>GOVERNANCE</td>
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EDF GROUP 2018 KEY FIGURES

Operational figures as of end 2018

- 39.8 million customer sites
- 126.5GW\(^{(1)}\) installed capacity
  - Nuclear 72.9GW
  - Renewables (incl. Hydro) 31.1GW
  - Fossil-fired 22.4GW
- 584.0TWh electricity output\(^{(2)}\)
  - Nuclear 78%
  - Renewables (incl. Hydro\(^{(3)}\)) 12%
  - Gas-fired 8%
  - Other fossil-fired 2%
- 165,790 employees
  o.w. 65,368 in EDF, 38,691 in Enedis, 14,545 in Framatome, 16,017 in Dalkia and 13,460 in EDF Energy

2018 Financials

- Sales: €69.0bn
- EBITDA: €15.3bn
- Net income excluding non-recurring items\(^{(4)}\): €2.5bn
- Net investments: €14.0bn
- Net financial debt: €33.4bn
- Ratings\(^{(5)}\): A- stable (S&P) / A3 stable (Moody’s) / A- stable (Fitch)

Extra-financial ratings

- CDP Climate: score of A (vs. A- in 2017), Leadership level
- RobecoSam: score of 79/100 (vs. 84 in 2017), Sustainability Leaders group
- Sustainalytics: score of 83/100 (vs. 82 in 2017), Leader of Utilities sector
- FTSE4Good: score of 4.4/5 (vs. 4.6 in 2017)

\(^{(1)}\) Consolidated capacities of EDF group
\(^{(2)}\) Output from fully consolidated entities
\(^{(3)}\) Hydro output including pumping
\(^{(4)}\) Net income excluding non-recurring items is not defined by IFRS, and is not directly visible in the consolidated income statement. It corresponds to the Group net income excluding non-recurring items, net changes in fair value on Energy and Commodity derivatives, excluding trading activities, net of tax and excluding net change in fair value of debt and equity securities, net of tax
\(^{(5)}\) Sources: rating agencies as of 19/03/2019
EDF SINCE 1946

Structural changes in the EDF group

Development in France

International development

1946
Nationalisation of the electricity and gas sectors

Creation of EDF as an EPIC by the Law of 8 April 1946

1963
Launch of the commercial-scale nuclear program

Development of the French industrial base, including hydro and nuclear facilities

1990
Start of the international development, first in South America, then in Europe with the UK (from 1998 onwards), Germany (2001) and Italy (2005)

1999

2004
On 20 November 2004, EDF becomes a French SA

IPO in 2005 and creation of RTE to guarantee non-discriminatory access to the market

2005
March 2014: acquisition by EDF of Dalkia’s activities in France

March 2014: acquisition by EDF of Dalkia’s activities in France

2009
March 2017: indirect sale of 49.9% of RTE to Caisse des Dépôts and CNP Assurances

March 2017: acquisition of British Energy Edison’s takeover

2011
March 2017: around €4bn of share capital increase

2012
March 2017: around €4bn of share capital increase

2014
March 2017: indirect sale of 49.9% of RTE to Caisse des Dépôts and CNP Assurances

April 2014: delegation to Exelon of the operational management of the nuclear reactors owned by CENG

2016
December 2017: launch of the Solar Plan

December 2017: Acquisition of 75.5% of Framatome capital

2017
November 2017: disposal of EDF Polska’s assets (Poland)

December 2017: Acquisition of 75.5% of Framatome capital

2018
December 2018: completion of the 2015-2018 Disposal Plan (Dunkerque LNG...)

France multi-year energy programme (PPE): Project published (25 January 2019)

GROUP STRATEGY

For more information, refer to the press release of 12 July 2018

For more information, refer to the slide p. 123

(1) For more information, refer to the press release of 12 July 2018

(2) For more information, refer to the slide p. 123
EDF GROUP: FLOW CHART

(1) Simplified flow chart
(2) Stakes with sizeable non controlling interests
(3) Please refer to the slide “Performance of EDF SA dedicated assets” on p.247
(4) Companies and participations held at different levels by the EDF Renewables Group
(5) The EDF’s stake disposal in Alpiq was announced in the Press release of 5 April 2019
THE EDF GROUP WILL PLAY ITS ROLE IN THE FRENCH ENERGY TRANSITION STRATEGY

The PPE paves the way for 3 structural measures of particular importance to EDF

STRENGTHENING THE REGULATORY FRAMEWORK

"The government will propose modalities for a new regulation of the existing nuclear fleet that will ensure the protection of consumers against market price increases beyond 2025 by making them benefit from the competitive advantage linked to the investment made in the historic nuclear fleet, while giving the financial capacity to EDF to ensure the economic sustainability of the generation units to meet the needs of PPE in low price scenarios."(1)

OPTIMIZING THE GROUP’S ORGANISATION

- Formal request to study alternative organisations of the Group’s assets and submit a proposal within 6 months of the adoption of the PPE decree
- Overarching goal to support the Energy Transition in France in connection with a change in the regulatory framework for existing nuclear assets
- EDF to remain one integrated Group
- Preservation of credit rating

PREPARING THE CASE FOR NUCLEAR NEW BUILD IN FRANCE

- EDF to prepare a comprehensive case for nuclear new build in France, addressing all relevant dimensions such as competitiveness, legal and regulatory framework and pre-financing
- Key milestone mid-2021 to enable a final investment decision

(1) Source: press pack released on 27/11/2018 by the Ministry for Ecological and Inclusive Transition
GROUP INDUSTRIAL PLAN: CAP 2030

EDF, an efficient and responsible electricity company that champions low-carbon growth

1 transformation programme

ACCOUNTABILITY PERFORMANCE

SIMPLIFICATION

DIGITAL INNOVATION

3 priorities

CUSTOMER FOCUS
To create new, competitive decentralised solutions, new personalised energy services and smart grids

LOW-CARBON GENERATION
To rebalance the energy generation mix by accelerating the development of renewable energy and guaranteeing the safety and performance of existing and new-build nuclear facilities

INTERNATIONAL DEVELOPMENT
To expand into new geographical areas by developing our low-carbon solutions in growth countries while bolstering our positions in Europe

Driven by human ambition
CAP 2030: AMBITIOUS OBJECTIVES ON 3 STRATEGIC AXES

CUSTOMER PROXIMITY

- Create new, competitive decentralised solutions, new personalised energy services and smart grids
  - Deploy new digital services for retail customers
  - Support the development of new uses of electricity (electric vehicles, buildings, etc.)
  - Accelerate R&D on storage, photovoltaics, electric mobility and new networks

LOW-CARBON GENERATION

- Achieve a new balance for the generation mix by accelerating the development of renewables and guaranteeing the safety and performance of existing and new-build nuclear facilities
  - Double the installed capacity of the Group’s renewable energy and hydropower fleet: from 28GW in 2014 to 50GW in 2030
  - Develop 30GW of photovoltaic solar in France between 2020 and 2035
  - Extend the lifespan of the existing French nuclear fleet beyond 40 years
  - Extend lifespan of the existing British nuclear fleet
  - Commission up to 10 EPRs by 2030 in France, the United Kingdom and internationally

INTERNATIONAL DEVELOPMENT

- Expanding into new geographical areas by developing our low-carbon solutions in growth countries while bolstering our positions in Europe
  - Triple the Group’s international activities by 2030
  - Become the benchmark in 3 to 5 emerging markets, and ensure a significant presence in a dozen countries to support their energy transition
  - Develop energy services activities and engineering services internationally

---

(1) Since the acquisition of British Energy by EDF, the operating life of the RAG plants has been extended by 8 years on average. For more information, see p. 88
(2) Partially financed by the Group
THE EDF SOLAR POWER PLAN\(^{(1)}\): ACCELERATION OF THE SOLAR MARKET IN FRANCE TO ACHIEVE CLIMATE PLAN GOALS

Solar photovoltaic power: internationally recognised expertise

EDF will draw on its industrial and financial capabilities to accelerate the development of photovoltaic solar power in France:

- Target of 30% of solar market share in France between 2020 and 2035, with first achievements as of 2020
- Total budget of €25 billion, financed mainly by partnerships
- Development of a robust and competitive solar industry

\(\text{(1) For more information about the Solar Power Plan, please see the heading "Renewables", p. 119}\)
THE STORAGE PLAN: A TARGET TO BECOME THE LEADER OF THE EUROPEAN SECTOR BY 2035

Storage has a critical role to play in the energy transition, alongside energy efficiency, nuclear and renewables. As a pioneer in this area, the Group is already involved in the main storage technology applications, including batteries and PSPS (1) Hydroelectricity.

EDF’s goal is to develop **10GW of additional storage** around the world by 2035, **on top of the 5GW** already operated by the Group

Representing an **investment** of **€8 billion** (2) during the 2018-2035 period (3)

EDF’s ambitions are focused **on all electricity storage markets**

- **To help ensure the smooth running of a balanced electricity system**

  - West Burton B, installation developed by EDF Renewables, commissioned in 2018

- **For residential customers, businesses and local communities**

  - The solar kit by ZECI, the Ivorian joint venture of EDF and OGE

- **To facilitate access to electricity in developing countries**

  - The offer **Mon Soleil&Moi** by EDF Énergies Nouvelles Réparties

**Increasing its R&D and its innovation capacity**

- **Investment in research into storage** for the power system of €70m for the 2018-2020 period

- €15m, a third of EDF Pulse Croissance’s investment in the next two years, allocated to projects and start-ups linked to electricity storage and flexibility

**2018 Achievements**

- **3 battery installations** commissioned for the balance of the electrical system in the United Kingdom, Italy and Reunion

- Obtaining a Power Purchase Agreement for the **Big Beau Solar Project** (128 MWp Solar and 40 MW Battery Storage) in the United States

- **New commercial offers** for private and corporate customers in the UK, Germany, Italy

- **Extension of the electricity access offer with solar panels and batteries in Ghana and Togo**, following the success in Côte d’Ivoire

---

(1) Pumped Storage Power Station
(2) Through equity investments and partnerships
(3) Please refer to the press release published by EDF on 27 March 2018
EDF’S ELECTRIC MOBILITY PLAN: 3 CORNERSTONES

AMBITION OF BEING THE LEADING E-MOBILITY ENERGY COMPANY IN EUROPE BY 2022

on our 4 main markets: France, UK, Italy, Belgium

<table>
<thead>
<tr>
<th>Leading power supplier for electric vehicles</th>
<th>Biggest charging network operator</th>
<th>Europe’s &quot;smart charging&quot; leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>A wider range of innovative commercial offerings</td>
<td>Turnkey charging solutions for all our customers in all situations</td>
<td>Stepping up the development of a &quot;smart charging&quot; infrastructure and related services</td>
</tr>
<tr>
<td><strong>TARGETS</strong></td>
<td><strong>TARGETS</strong></td>
<td><strong>TARGETS</strong></td>
</tr>
<tr>
<td>→ 2022: Supplying power for 600,000 electric vehicles = 30% of market share</td>
<td>→ 2020: 1 charging solution for all our customers with a parking space</td>
<td>→ 2020: 4,000 smart charging points deployed</td>
</tr>
<tr>
<td></td>
<td>→ 2022: 75,000 charging points deployed and providing access to 250,000 interoperable terminals</td>
<td>→ 2035: 1.5 million smart vehicles = 25% of market share</td>
</tr>
</tbody>
</table>

A stronger partnership strategy
Low-carbon electricity: a strategic focus for EDF

Commitment taken in May 2018 to continue strongly reducing the Group’s direct emissions

- 2030 Objective: 30 MtCO₂ or -40% vs. 2017 (~40gCO₂/kWh)
- Monitoring of the objective and management of the Group’s carbon budget at EDF's Executive Committee level

Outstanding CO₂ performance in 2018: 35.5 MtCO₂ (57gCO₂/kWh), due to:

- Exit of fossil assets from the scope (sale of coal assets in Poland, closing of the last fuel units in France)
- The best hydraulic production in France for 15 years
- France nuclear availability up sharply
- A competitiveness of gas plants vs. coal plants, improved in line with the significant rise of CO₂ prices in Europe

CO₂ EMISSIONS(1): EXCEPTIONAL PERFORMANCE IN 2018, EFFORTS TO MAINTAIN TO REACH GROUP COMMITMENTS

(1) Direct CO₂ emissions (scope 1 in total), excluding life cycle analysis (LCA) of generation plants and fuel
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</table>
The materiality analysis identifies the relevant issues that may have an impact on the company’s performance and ranks them according to their potential impact on the company and its environment. The materiality matrix (1) was created on the basis of documentary studies, interviews and workshops conducted with about a hundred people. The external stakeholders included internationally-recognised and qualified individuals, as well as representatives of the Group’s main stakeholders (administrative authorities, public officials, shareholders, banks, customers, partners, subcontractors, suppliers, NGOs). Internally, members of the Executive Committee have been involved in the drafting process, as well as managers from the main departments and subsidiaries of the Group. The matrix was examined in a meeting of the EDF stakeholders panel and the Sustainable Development Board (2), and then validated by the Executive Director of Innovation, Strategy and Planning. The great majority of these updated issues are the subject of specific attention in the context of the Corporate Social Responsibility Goals and are detailed in the Reference Document.

(1) In accordance with the definition of the principle of materiality, as it appears in Article 225 of the Grenelle 2 Law, the AA 1000 assurance standard, the GRI G4 guidelines, ISO 26000 standard and the IIRC framework on integrated reporting.

(2) This concerns a panel of external EDF stakeholders which contributes to challenging Group issues submitted to it.
SIX AMBITIOUS CORPORATE SOCIAL RESPONSIBILITY GOALS SET THE ROADMAP FOR THE GROUP TO DELIVER CAP 2030

- A commitment to change and to working as closely as possible with customers and regions, at the heart of the energy transition and climate issues
- Major and prior commitments, with results reported by the Group\(^{(1)}\) every year

<table>
<thead>
<tr>
<th>CSRG no.1</th>
<th>CLIMATE CHANGE</th>
</tr>
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<tbody>
<tr>
<td>The Corporate Responsibility Objective is to go beyond the 2 °C path by limiting the Group's direct CO(_2) emissions to 30mt in 2030. In 2018, the indicator amounted to 35.5mt</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CSRG no.2</th>
<th>HUMAN DEVELOPMENT</th>
</tr>
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<tbody>
<tr>
<td>To adopt industrial groups' best practices in terms of human development: health &amp; safety, gender diversity, and social advancement</td>
<td></td>
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<tr>
<th>CSRG no.3</th>
<th>FUEL POVERTY</th>
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<tr>
<td>To offer all vulnerable people information about and support with energy use and energy benefits</td>
<td></td>
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</table>

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<tr>
<th>CSRG no.4</th>
<th>ENERGY EFFICIENCY</th>
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<tbody>
<tr>
<td>Supporting the energy transition of our customers, through tailored offers and more broadly that of all energy consumers through the development of electric mobility, storage solutions and smart grids</td>
<td></td>
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<table>
<thead>
<tr>
<th>CSRG no.5</th>
<th>DIALOGUE &amp; CONSULTATION</th>
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<tr>
<td>To systematically organise a process of transparent and open dialogue and consultation for every new project around the world</td>
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<tr>
<th>CSRG no.6</th>
<th>BIODIVERSITY</th>
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</thead>
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<tr>
<td>To launch a positive approach to biodiversity, not limited to understanding and reducing the impacts of our activities in the long run but having a positive effect on biodiversity</td>
<td></td>
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</tbody>
</table>

\(^{(1)}\) 2018 Reference document, Chapter 3 – Environment and societal Information – Human resources
**CO₂ EMISSIONS**\(^{(1)}\) **UNDERGO A STRUCTURAL DECREASE**

The reduction in CO₂ emissions is the result of a long-term low-carbon industrial policy with the closure of coal-fired power plants and the improving of the efficiency of thermal power plants and the environmental performance of the power generating fleet.

- **Double the installed capacity of the renewable energy fleet throughout the world:** going from 28GW in 2014 to 50GW in 2030

**Group’s renewable energy fleet at the end of 2018**

Data consolidated according to EDF’s percentage ownership in Group companies, including investments in associates and joint ventures

### Specific CO₂ emissions\(^{(1)}\) (g/kWh)

**2018**

- France – Generation and supply activities: 14 g/kWh
- France – Regulated activities: 502 g/kWh
- EDF Group worldwide: 57 g/kWh

---

\(^{(1)}\) CO₂ emissions from electricity and heat production power plants, fully consolidated according to IFRS financial standards, excluding the life cycle analysis of the means of production and fuels.
To meet its industrial challenges, EDF must remain a socially-responsible and engaged employer, a leader in terms of the professionalism and involvement of its employees, by developing their skills and the diversity of their profiles. The Group also seeks to set an example in terms of social innovation by promoting a participative approach and making it easier to share good practice, in order to ensure long-term performance.

**5 fundamental values of the “Human Ambition” supported by CAP 2030**

- Developing a digital culture and new ways of working
- Making people accountable and simplifying working procedures
- Developing and adapting skills
- Transforming the recognition model
- Being the leader in health and safety field

**Being a benchmark employer in terms of employee commitment and social performance**

- The framework agreement “Corporate Social Responsibility” signed on June 19, 2018 aims to ensure the development of a social base common to the 160,000 employees of the Group and to consolidate the international social dialogue. It includes several important and innovative social responsibility commitments, such as tax transparency, whistleblower protection, the duty of care to subcontractors and suppliers. It is complementary to the 6 Corporate Social Responsibility Goals (CSRG) of which the CSRG n°2 and the strategy of the Cap 2030 Group.

- A level of employment that remains at a high level (> 9,500)
- 40,901 women, 24.6% of the workforce
- 26.3% of women on the Management Committees
- 6,958 students on work-study programs present in the Group in 2018

In 2018, EDF: keeps its first place as energy company among students of engineering schools.
Transformation support that combines agility with responsibility:

New modes of knowledge transmission:
- The enhanced digitalisation of training: use of virtual and augmented reality, simulators, MOOC, serious games, eLearning modules, etc.
  - In 2018, nearly 33,600 employees attended a self-service e-learning module on ecampus.
- The Chocolaterie, an internal incubator, has welcomed more than 10,000 people since its inception in 2016 and has contributed to the deployment of more than 100 projects through innovative methods such as "Design Thinking" or the development of business projects

Development of managerial training programs by the Group University of Management
- The project management training offer widened with the launch of new offers for junior and senior managers
- Training offers in the areas of energy and Group strategy were renewed in 2018
- Training of nearly 1,000 leaders and talents of the Group in 2018

Modernization of tools in support of mobility and career development:
- "Cart’Emploi", a geolocation tool for sites, with information on available positions
- The “MyJob” project: helps match the projects of employees whose activity has been decreased or eliminated with jobs in departments looking for candidates
- Creation of a single area dedicated to career paths, mobility and training
- “Profile sheets” of employees on the intranet, in order to valorise their experiences and skills
- "Mobileasy" platform, offering digital services to support employees at each phase of their mobility project, and to promote the matching of the supply and demand of skills

- Employees trained

7,629,101 Training hours
138,131 Employees trained
83% Employees were trained in the year
The Group's new health and safety policy, adopted in April 2018, defines a framework of common consistency in which this policy is applicable:

- in all companies controlled by the Group, in all countries where EDF operates;
- Group employees and subcontractors working on its premises and offices;
- the new policy builds on a commitment signed by the President and all members of the Comex.

The CAP 2030 programme’s strategic health and safety objectives:

- To eradicate deadly accidents
- To reduce the number of accidents
- To combat the absenteeism

The key ambition for the coming years is implemented in all the companies of the Group in order to:

- Make health and safety one of the Group’s major commitments and an essential component of its culture
- Place managers at the heart of the deployment of health & safety policy
- Make all employees accountable on a daily basis
- Protect and promote the health of all: employees, service providers, clients and local people

Results in line with the ambition

Frequency rate of occupational accidents with absence(1)

- Frequency rate involving the employees in the Group stable in 2018

Health and safety training

- EDF’s profit-sharing criteria on the number of safety and health training courses taken by employees in e-learning

Did you know?

In 2018, 33.9% of EDF Group employees are covered by a Health and Safety Management System certification (OHSAS18001, ISO 45001, MASE, VCA).

(1) Number of occupational accidents that led to an absence from work of more than one day, recorded over the current year and per million hours worked
BIODIVERSITY

This commitment, taken from the Group’s scope, concerns the entire lifecycle of facilities, from the study of projects, through construction and operation, to the end of life of the facilities. It covers the entire value chain, including procurement policies and relations with suppliers and subcontractors. The Group intends to develop a positive approach to biodiversity, focusing on improving its practices and avoiding as much as possible irreversible damage to nature. Indeed, EDF does not wish to be limited to a defensive approach to biodiversity, only focused on reducing the impact of its industrial activities on ecosystems. In 2018, the Group’s commitment to the act4nature initiative specifies how to deploy this CSRG, which is now broken down into five main objectives:

- mobilizing the Group’s entities;
- knowing the biodiversity issues and implementing concrete actions;
- innovating for biodiversity;
- committing in a participatory and open process;
- contributing to public policies.

Committed to biodiversity

Rate of knowledge of the ecological quality of land\(^{(1)}\): **69%**

\(^{(1)}\) These are field inventories; in 2018, the scope of this indicator covered EDF (metropolitan France) and EDF Energy; it will be gradually extended to all Group entities.

### Number of threatened species located in EDF’s local authorities

<table>
<thead>
<tr>
<th>IUCN Categories of Threatened Species</th>
<th>Global Red List</th>
<th>National Red List</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR</td>
<td>EN</td>
</tr>
<tr>
<td>France mainland</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Overseas &amp; French Islands</td>
<td>18</td>
<td>23</td>
</tr>
</tbody>
</table>

**Data updated in 2018.**


**UICN :** l’Union internationale pour la conservation de la nature

### Number of EDF sites located in or near a protected area

<table>
<thead>
<tr>
<th>Protected areas / international conventions</th>
<th>Protected Areas at National Level (IUCN Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ia</td>
</tr>
<tr>
<td>France - Mainland</td>
<td>23</td>
</tr>
<tr>
<td>Europe except France</td>
<td>24</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>1</td>
</tr>
<tr>
<td>Total amount</td>
<td>67</td>
</tr>
</tbody>
</table>

**CRG no. 6  BIODIVERSITY**
WATER: A RESOURCE UNDER CONTROL, AN INTERNATIONAL COMMITMENT

Low Group exposure to water stress

The exhibition of means of production of water stress group was evaluated and is under control. Most of the water withdrawn from its facilities is in France 81% and in the United Kingdom 17% in areas where there is no permanent water stress; most nuclear and thermal installations are located on the seaside so do not use fresh water. In addition, in situations where a potential one-time risk has been identified, appropriate measures have been taken at design or during operation. In accordance with local discharge regulations, the Group’s companies take the necessary measures to comply with water quality and temperature requirements, and take immediate corrective action in the event of non-compliance.

Breakdown of water withdrawn by type of water (%)

- Sea water
- Brackish or estuary water
- Fresh water

Innovating towards sustainable water use

The EDF Group has been committed since 2013 to preserving water resources in all its activities and, since 2015, to publishing its “water footprint”

<table>
<thead>
<tr>
<th>Group</th>
<th>Water consumed/thermal production in (l/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1.06</td>
</tr>
<tr>
<td>2016</td>
<td>1.03</td>
</tr>
<tr>
<td>2017</td>
<td>1.03</td>
</tr>
<tr>
<td>2018</td>
<td>0.97</td>
</tr>
</tbody>
</table>

Cooling towers at the Saint Laurent des Eaux nuclear plant on the banks of the Loire
A RIGOROUS MONITORING SUPPORTED BY AN EXTERNAL VERIFICATION

- **Certification**: 95.6% of Group sales covered by the ISO 14001 certification

- **Certification ISO 14001 (2015 standard)**: In 2018, the Afnor certifier underlined the ever stronger integration of sustainable development into the Group's strategy, as well as the efforts made to tool and simplify the process (as for example in the operational implementation of the HSE tool on regulatory compliance watch)

- **Third party verification**: since 2005, the Group undergoes a voluntary process whereby the quality of its social and environmental indicators is verified by Statutory Auditors

**2005 & 2006**
- "Agreed-upon procedures" level of verification

**2007 - 2010**
- "Limited assurance" verification on a selection of indicators

**2011 & 2012**
- "Mixed assurance" verification
  - reasonable on carbon and workforce
  - limited on other indicators

**2013 – 2017**
- Attestation of presence of CSR information
- Reasoned opinion on the sincerity of this information with insurance
  - reasonable on CO₂ and effective
  - moderate on other indicators

**2018**
- Certificate of conformity of the DPEF
- Reasoned opinion on the conformity and sincerity of the DPEF and the results of policies with insurance
  - reasonable on CO₂ and headcount
  - moderate on other indicators

**Compliance of the statement according to the Commerce Code**
- Continuation of the voluntary process

Voluntary progressive approach until the obtaining of a Mixed Assurance
NON-FINANCIAL RATINGS (1/2)

- Maintaining a high level of performance: EDF reinstated in the *CDP Climate change A List* and confirmed in the *DJSI World*
- Higher rating by Sustainalytics and VigeoEiris (EDF included in all four indices to which the Group is eligible)

| ROBECOSAM | EDF confirmed at DJSI World in 2018
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze Class of Sustainability Yearbook 2018, 8th of 98 Electric Utilities</td>
<td></td>
</tr>
<tr>
<td>EDF score</td>
<td>2017</td>
</tr>
<tr>
<td>Average Electricity sector score</td>
<td>84%</td>
</tr>
<tr>
<td>50%</td>
<td>46%</td>
</tr>
</tbody>
</table>

| CDP | EDF member of the A list, member of CDLI France and Bénélux 2018
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Climate Disclosure Leadership Index)</td>
<td>Overall Annual Score</td>
</tr>
<tr>
<td>Performance and transparency</td>
<td>A-</td>
</tr>
</tbody>
</table>

| FTSE4Good | EDF member of the FTSE4Good Index
| --- | --- |
| Group admission confirmed en 2018
EDF 3rd company in its sector
EDF rated 4.4/5 in 2018 (vs. 4.6/5 in 2017) | |
| EDF is one of the five global nuclear operators meeting the stringent criteria developed and overseen by the FTSE4Good Policy Committee |

| SUSTAINALYTICS | EDF member of the STOXX ESG Leaders Index 2018, 6th of 193 Utilities and 1st among his peers
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Leaders Index)</td>
<td>EDF rated 83/100 in 2018 (vs. 82/100 in 2017)</td>
</tr>
</tbody>
</table>

| EUROPEX | EDF member of all Euronext Vigeo indices: World 120, Europe 120, Eurozone 120 et France 20 and 5th of 62 Electric & Gas Utilities
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EDF rated 66/100 in 2018 (vs. 60/100 in 2016)</td>
</tr>
</tbody>
</table>
2018: the EDF group once again in CDP Climate Change “A List”

Out of the 7,018 global companies that responded to the CDP in 2018, only 126 (or less than 2%) made the prestigious “A list”, including 22 French companies.

Out of the 274 electric utilities surveyed by investors, only 3 are members of the A list CDP Climate Change A List, including EDF.

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Global performance (D- to A)</td>
<td>B</td>
<td>B</td>
<td>A-</td>
<td>A</td>
<td>A-</td>
<td>A</td>
<td>↗</td>
</tr>
</tbody>
</table>

This highest rating “A” illustrates in particular the commitment made by the Group in 2018 to reduce emissions (1) of CO₂ (to 30mt in 2030) and underlines its excellent CO₂ performance (1): 57g/kWh in 2018, while the world average is 490g, and that of the European Union is 299g. EDF’s performance has made a significant positive contribution in terms of avoided emissions.

(1) Direct emissions, excluding life cycle analysis of the means of generation and fuels.
CAP 2030: EDF PULSE EXPANSION: EDF GROUP’S START-UP INCUBATOR (1/3)

EDF Nouveau Business changes its name to become **EDF Pulse Expansion** and join the Group's innovation brand: EDF Pulse

Creating the EDF Group of tomorrow

Through strategic partnerships, equity investments and joint ventures with external start-ups

By investing through 13 venture capital funds (Electranova Capital, etc.)

By offering an incubation and acceleration program for entrepreneurs and projects developed by Group employees

**MISSIONS AND MEANS**

**€30m TO INVEST PER YEAR**

Finding new growth drivers for the EDF group

Launching new offers and new innovative and competitive services for customers

Creating new activities for the Group
CALLS FOR PROJECTS

Launching thematic calls for projects several times a year to enable start-ups to stand out and benefit from paid experimentation. These calls for projects are carried out with the Group’s different business lines and external partners.

<table>
<thead>
<tr>
<th>Year</th>
<th>Category</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>NUCLEAR DECOMMISSIONING</td>
<td>6 winners, 1 acquisition: OREKA Solutions</td>
</tr>
<tr>
<td>2018</td>
<td>SILVER ECONOMY</td>
<td>3 winners</td>
</tr>
<tr>
<td>2018</td>
<td>INHABITANT SERVICES</td>
<td>3 winners, 1 acquisition: ZENPARK</td>
</tr>
</tbody>
</table>
CAP 2030: EDF PULSE CROISSANCE: EDF GROUP’S START-UP INCUBATOR (3/3)

Investments already made since September 2017

Our mission is to explore the energy and digital transition in its multiple dimensions

Michel Vanhaesbroucke, Director of EDF Pulse Growth
R&D TO INNOVATE TODAY AND VENTURE INTO TOMORROW

EDF’s R&D supports the departments and subsidiaries of the EDF group on a daily basis with 2 missions:

- Improve performance in all activities today
- Prepare for the future by working on breakthrough technologies

R&D also conducts research for clients outside the EDF group through partnerships or orders.

EDF’s R&D covers all the business areas and activities in the energy sector. In line with EDF Group’s Cap 2030 strategy, its research focuses on four main priorities:

- Customers and regions
  - Develop and test new energy services
- Competitiveness of energy systems in France and abroad
  - Prepare the electricity grids and networks of tomorrow
- Nuclear and renewable energies
  - Consolidate and develop competitive and low-carbon generation mixes
- Partnerships
  - Support the development of the Group internationally by developing research partnerships

EDF’s R&D in 2018:

- 1,900 employees in France
- 117 PhD students
- 160 teacher-researchers
- 9 research centres:
  - 3 in France
  - 6 internationally (Germany, United Kingdom, China, United States, Singapore and Italy)
- 13 joint laboratories with partners
- + 300 academic and industrial partnerships around the world
- 615 patented innovations protected by 1,906 property titles in France and abroad
- €510 million budget in 2018
R&D: EXPERTISE, TEST FACILITIES, GLOBAL KNOW-HOW

- R&D mobilises its energy experts for the benefit of the EDF group entities and subsidiaries, as well as external customers. It relies on more than 70 platforms for testing, measurement and simulation, among the most modern and effective in the world, in all areas of the energy sector.

- R&D also provides its customers with expertise in large-scale digital simulation software and supercomputers. EDF’s R&D has a computing capacity of 4 péttaFLOPS, making it one of the largest players in this field.

- R&D also shares its knowledge and expertise through training courses taught by EDF researchers within ITECH.

3 research priorities

- The electricity transition
- The climate transition
- The digital and societal transition

EDF has decided to create its largest R&D centre in the heart of Paris-Saclay, which will ultimately bring together 20% of research in France.
R&D INNOVATES TO PREPARE FOR THE FUTURE

R&D is leading 5 new technological breakthrough projects

- Electricity to decarbonise the economy
- Storage and decentralized production
- Smart building & smart cities
- The nuclear power of tomorrow
- Towards a more agile R&D at the service of tomorrow's EDF group

Did you know?

Since 2011, EDF Pulse Explorer* has identified nearly 8,000 innovative start-ups in the field of energy in France and around the world, and offers the Group's business divisions and subsidiaries around 120 demonstrations a year.

* In 2019, Innovation Hub joins EDF Pulse, the EDF group’s innovation network, and becomes EDF Pulse Explorer

R&D Inside: the contribution of R&D to some major achievements of the EDF group

- **OFFSHORE WIND POWER**
  Study of foundations, flotation solutions, connection and site selection

- **SOWEE CONNECTED STATION**
  Development of algorithms

- **INTELLIGENT CHARGING**
  Of electric vehicles

- **VVPRO PREPRA**
  Using virtual reality to help plan work in a nuclear power plant

- **STORAGE**
  Battery frequency adjustment

- **EDF CITY PLATFORM**
  Support tool for decision-making in urban planning
THE GROUP EDF

- GROUP STRATEGY P. 6
- CORPORATE RESPONSIBILITY P. 17
- INNOVATIONS P. 29
- GOVERNANCE P. 36
COMPOSITION OF THE BOARD OF DIRECTORS AND OF ITS COMMITTEES AS OF 16/05/2019

Audit Committee
- Chaired by a director appointed by the General Shareholder’s Meeting
- 2 other directors appointed by the General Shareholders’ Meeting
- 4 directors elected by the employees

Board of Directors
- 11 directors appointed by the General Shareholders’ Meeting
  - 5 on recommendation from the French State
  - the Chairman and Chief Executive Officer
  - 5 independent directors
- 6 directors elected by the employees
- 1 Representative of the French state

Governance and Corporate Social Responsibility Committee
- Chaired by an independent director appointed by the General Shareholders’ Meeting
- 2 other directors appointed by the General Shareholders’ Meeting
- 3 directors elected by the employees

Nuclear Commitments Monitoring Committee
- Chaired by a director appointed by the General Shareholders’ Meeting
- 3 other directors appointed by the General Shareholders’ Meeting
- 2 directors elected by the employees

Appointment & Compensation Committee
- Chaired by an independent director appointed by the General Shareholders’ Meeting
- 1 other independent director appointed by the General Shareholders’ Meeting
- 1 Representative of the French State
- 1 director elected by the employees

Strategy Committee
- Chaired by the Chairman and Chief Executive Officer
- 3 other directors appointed by the General Shareholders’ Meeting
- 1 Representative of the French State
- 4 directors elected by the employees

(1) These members meet the criteria of both expertise (article L.823-19 of the French Commercial Code) and independence (code AFEP-MEDEF)
(2) This member meets the criteria of independence (code AFEP-MEDEF)
(3) Directors who are not members of the Strategy Committee may attend its meetings
**BOARD OF DIRECTORS MEMBERS AS OF 16/05/2019**

### Directors appointed at the General Shareholders’ Meeting

- Jean-Bernard LÉVY (1)
- Bruno CREMEL (1)
- Colette LEWINER (2)
- Laurence PARISOT (2)
- Claire PEDINI (3)
- Philippe PETITCOLIN (1)
- Gilles DENOYEL, appointed on recommendation of the French State (1)
- Maurice GOURDAULT-MONTAGNE, appointed on recommendation of the French State (2)
- Marie-Christine LEPETIT, appointed on recommendation of the French State (2)
- Anne RIGAIL, appointed on recommendation of the French State (1)
- Michèle ROUSSEAU, appointed on recommendation of the French State (2)

### Director representing the French State

- Martin VIAL

### Directors elected by the employees

- Christine CHABAUTY (4)
- Jacky CHORIN (4)
- Christophe CUVILLIEZ (4)
- Marie-Hélène MEYLING (4)
- Jean-Paul RIGNAC (4)
- Christian TAXIL (4)

### Characteristics of the Board of Directors' composition

- 41.7% independent qualified directors (5)
- 50.0% of women sitting on the Board (5)
- Skills and expertise in line with the diversity policy which was adopted by the Board
- Staggered renewal of the directors (4 years term of office)

---

(1) Term of office expiring at the end of the General Meeting called to approve the financial statements for 2022.
(2) Term of office expiring at the end of the General Meeting called to approve the financial statements for 2020.
(3) Term of office expiring at the end of the General Meeting called to approve the financial statements for 2019.
(5) Excluding directors that represent the employees
EDF GROUP EXECUTIVE COMMITTEE AS OF 01/07/2019

- Jean-Bernard LÉVY Chairman and Chief Executive Officer (CEO)
- Marc BENAYOUN Group Senior Executive Vice President in charge of Customers, Services and Regional Action. He also oversees Edison and the Group’s gas business
- Bruno BENSASSON Group Senior Executive Vice President in charge of Renewable Energies.
- Christophe CARVAL Group Senior Executive Vice President in charge of Group Human Resources
- Xavier GIRRE Group Senior Executive Vice President in charge of Group Finance
- Véronique LACOUR Group Senior Executive Vice President in charge of Change Management and Operational Efficiency
- Marianne LAIGNEAU Group Senior Executive Vice President in charge of the International Division
- Cédric LEWANDOWSKI Group Senior Executive Vice President in charge of Nuclear and Thermal business
- Alexandre PERRA Group Senior Executive Vice President in charge of Innovation, Corporate Social Responsibility and Strategy
- Simone ROSSI Group Senior Executive Vice President, CEO of EDF Energy
- Pierre TODOROV Group Senior Executive Vice President and Group General Secretary
- Xavier URSAT Group Senior Executive Vice President in charge of Engineering and New Nuclear Projects

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

(1) See the press release of 20 May 2019

GOVERNANCE
EDF: SHAREHOLDING STRUCTURE AS OF 31/12/2018

Share capital as of 31/12/2018

- **EDF employees**: 1.15%
- **Institutional and retail investors**: 15.06%
- **Treasure shares**: 0.12%
- **French State**: 83.67%

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

---

Share information as of 31/12/2018

<table>
<thead>
<tr>
<th>Shares</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of shares</td>
<td>3,010,267,676</td>
</tr>
<tr>
<td>Number of shares outstanding</td>
<td>3,006,539,657</td>
</tr>
<tr>
<td>Number of treasure shares</td>
<td>3,728,019</td>
</tr>
<tr>
<td>French security identification no. (ISIN code)</td>
<td>FR0010242511</td>
</tr>
<tr>
<td>Main index</td>
<td>CAC Next 20, Euro Stoxx Utilities, Stoxx Europe 600 Utilities, Euronext 100</td>
</tr>
<tr>
<td>Listing</td>
<td>Paris (Euronext Paris)</td>
</tr>
</tbody>
</table>

Pursuant to article L 225-123 of the French Commercial Code, as amended by the Act n°2014-384 of 29/03/2014, the so-called “Loi Florange”, all fully-paid shares that have been held in registered form for at least 2 years in the name of the same shareholder will automatically entitle their holder to double voting right. These provisions have taken effect on 3 April 2016. As of 31 December 2018, the French State holds 83.67% of EDF’s share capital and 88.83% of EDF’s voting rights.

---

(1) On January 15, 2018, the French State entered into a share allotment agreement with EPIC Bpifrance, whereby it allotted 389,349,361 EDF shares, representing at December 31, 2018, 12.93% of the share capital and 8% of the voting rights. They will act together and will have to consult each other before every Shareholders’ Meeting of EDF. The EPIC Bpifrance has undertaken not to transfer the securities, to put them back as collateral or otherwise to dispose of them.

(2) Including Epic Bpifrance
EDF: A LISTED COMPANY MAJORITY OWNED BY THE FRENCH STATE

EDF state-owned company: legal and contractual framework

- EDF’s chairman and CEO is appointed by decree of the President of France on recommendation of the Board of Directors.
- In accordance with article 13 of the French Constitution, the chairman and CEO is appointed based on the candidates’ interviews and the opinion of the relevant permanent committees of the French National Assembly and Senate.
- Since the Shareholders’ Meeting of November 2014, the Board of Directors can be composed of 3 to 18 members, including members appointed by the Shareholders’ Meeting(1), a State representative(2), and one-third of employees’ representative elected in accordance with the provision of the Act of 26 July 1983.
- Any decision related to financials, investments, acquisitions and disposals, or related to the compensation of corporate officers must be approved by the French State (the Decree of 9 August 1953 and the Order of 20 August 2014).
- The company faces numerous financial controls by different authorities: State Inspector, Cour des Comptes (Government Audit Body), Finance Inspection.
- The French State Shareholdings Agency (APE) represents the State as a shareholder.

EDF listed company: corporate governance

- EDF has to abide by listed companies laws and specific standards of a public sector entity.
- Internal rules of its Board of Directors are similar to those of other listed companies.
- EDF adheres to the consolidated AFEP- MEDEF Code which is the corporate governance code to which the company refers, in accordance with the French commercial code, subject to the specific laws and regulations applicable to EDF.
- EDF is subject to the rules relative to the balanced representation of women and men on Boards of Directors and Supervisory Boards and has to respect the proportion of members of the Board of each sex of not less than 40%, excluding directors that represent the employees (Commercial Code and executive order of 20 August 2014). In accordance with AFEP-MEDEF Code, the EDF Board must include a third of independent qualified members (3). The Board of directors is required to adopt a diversity policy for its members (Commercial Code).
- The Board of Directors has created five dedicated committees to review and prepare certain projects before their submission to the Board of Directors.
- The Governance and Corporate Social Responsibility Committee reports annually on the functioning of the Board of Directors and proposes areas for improvement. Furthermore, every 3 years, this evaluation is conducted by a specialist external consultant under the supervision of the the Governance and Corporate Social Responsibility Committee.
- EDF is compliant with internal control procedures COSO(4).

---

(1) If need be upon recommendation from the State, in accordance with article 6 of the Order of 20 August 2014.
(2) Appointed by the Minister of Economy amongst State agents, in accordance with article 4 of the Order of 20 August 2014.
(3) In accordance with the independence criteria indicated by the AFEP-MEDEF code.
(4) Committee Of Sponsoring Organizations of the Treadway Commission.
EDF’S INTERACTION WITH THE FRENCH STATE SHAREHOLDING AGENCY (APE)

- The French State Shareholding Agency (APE) is a national department controlled by the Minister of Economy and Finance. It performs the function of the State shareholder by safeguarding the State’s patrimonial interests and the management of its investments. As such, it proposes and implements the decisions and policies of the French State with the related ministries.

- Its main objectives consist of:
  - Reviewing the appropriateness and financial health of the company
  - Representing the French Government as a shareholder
  - Facilitate relationship between the company and the French Government

- As a result, the APE has expressed the following requirements to public sector enterprises. They have to:
  - Designate points of contact persons for the APE
  - Prepare a scorecard reporting for the APE on the main financial and qualitative data
  - Organise regular meetings, at least once a year to present the company strategy and financial performance
  - Inform the APE of any investment operation, or any specific audit mission
OTHER REGULATORY BODIES WITH AN IMPACT ON EDF’S ACTIVITIES

The French Nuclear Safety Authority (ASN)

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

- Regulation through the submitting of opinions to the French government on draft decrees and ministerial orders, and by the regulatory decisions of a technical nature that it adopts
- The individual authorisations it grants for the operation of the plants, in particular the authorisations for restarting after the reactor stoppages
- The control of the installations that it carries out through the on-site regulatory inspections, scheduled or unannounced (with an average of 650 INB inspections per year, and 635 in 2017), in particular on the occasion of periodic reviews of compliance and re-evaluation security, mandatory for the continuation of the operation of the plant

The CRE (French Energy Regulation Commission)

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

- Energy networks
  - Access to regulated networks and their operation and development
  - Independence of network operators
- Energy markets
  - Monitor deals on energy and CO₂ markets
  - Monitor retail markets (for instance, making proposals for regulated tariffs’ evolution)
- Regulated tariffs
  - As per the provisions of the French Energy Code, the CRE henceforth is in charge of proposing the evolutions of all the regulated electricity sale tariffs
OTHER CONTROL PROCEDURES INVOLVING EDF

EDF may be subject to State audit procedures, in particular through economic and financial evaluation assessment and through verifications by the French General Finance Inspectorate (Inspection Générale des Finances).

The company's accounts and management, and where applicable, those of its directly-held majority subsidiaries are under the control of the Cour des Comptes (National Audit Court). Thus have been published on the Cour des comptes website:

- Report on EDF's international strategy
- Report on the management of the Électricité de Strasbourg group
- Report on working hours in the Group’s main entities
- Summary proceedings with the Minister for the Ecological and Inclusive Transition and to the Minister of Economy and Finance on the assessment of the implementation of Regulated Access to Historic Nuclear Power (ARENH)
- Annual public report 2019, Volume II, on the wage policy at EDF SA

EDF must also undergo the audit procedures performed by the French Parliament.
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<td>P. 59</td>
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</table>
EDF GROUP’S NET INSTALLED CAPACITY BY COUNTRY IN 2018

The Group is driving its transformation forward based on an energy mix that combines nuclear and renewable power. In France, it is implementing an industrial strategy of extending the operating life of nuclear power plants beyond 40 years by investing €45 billion in the Grand Carénage programme for the period 2014-2025. Elsewhere, its subsidiary EDF Renewables is developing positions in new markets: South Africa, Brazil, Chile, India and China.

- **Europe 121,355 MWe**
  - France 95,317 MWe
  - United Kingdom 14,454 MWe
  - Italy 6,517 MWe
  - Switzerland 1,711 MWe
  - Belgium 1,983 MWe
  - The Netherlands 435 MWe
  - Portugal 205 MWe
  - Greece 250 MWe
  - Germany 309 MWe
  - Poland 194 MWe

- **Americas 7,247 MWe**
  - United States 4,671 MWe
  - Brazil 1,208 MWe
  - Chile 188 MWe
  - Mexico 349 MWe
  - Canada 631 MWe

- **Asia 3,675 MWe**
  - Indonesia 402 MWe
  - China 2,659 MWe
  - Vietnam 432 MWe

- **Africa 106 MWe**
  - United Arab Emirates 43 MWe
  - South Africa 56 MWe
  - Morocco 50 MWe

**N.B.** The values correspond to the first decimal or integer closest to the sum of the precise values, taking into account rounding (1) Including small hydropower plants in France and assets in overseas France
(2) Excluding energy storage capacity and EDF Renewables biogas production capacity

Data consolidated according to EDF’s percentage ownership in Group companies, including associates and joint ventures.

Source: Performance 2018
# ELECTRICITY OUTPUT AS OF 31 DECEMBER 2018

**Output from fully consolidated entities**

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In TWh</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>447.7</td>
<td>457.8</td>
</tr>
<tr>
<td>Hydro(^{(1)(2)})</td>
<td>40.9</td>
<td>51.6</td>
</tr>
<tr>
<td>Other Renewables</td>
<td>15.1</td>
<td>17.2</td>
</tr>
<tr>
<td>Gas</td>
<td>50.1</td>
<td>44.1</td>
</tr>
<tr>
<td>Coal</td>
<td>21.7</td>
<td>8.6</td>
</tr>
<tr>
<td>Fuel oil</td>
<td>5.3</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td>580.8</td>
<td>584.0</td>
</tr>
</tbody>
</table>

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 after deductions of pumped volumes is 33.8TWh in 2017 and 44.3TWh in 2018.

\(^{(2)}\) Including marine energy: 0.6TWh 2017 and 0.5 in 2018.
FRANCE – COUNTRY PROFILE

Key points

- EDF is active on the whole electricity value chain, from generation to sales and optimisation/trading. The activities can be split into:
  - **Unregulated activities**: generation and supply, optimisation and trading
  - **Regulated activities**, with RTEn(1,2)(transmission) and Enedis(2) (distribution). EDF’s activities in Corsica and the French overseas departments and municipalities are managed by the Island Energy Services (SEI) and are regulated, as well as the activities of the subsidiary ES (Electricité de Strasbourg)(3)

- EDF owns the largest nuclear fleet worldwide, o/w 58 operating plants in France

- RTE(1) and Enedis are subsidiaries of EDF but are operationally independent (legal unbundling), within the meaning of the provisions of the French Energy Code

- EDF also plays a holding role through the 100% control of EDF International (which controls the greater part of EDF stakes in international subsidiaries) as well as interests in various companies, including:
  - **EDEV** (o/w EDF Renouvelables, Électricité de Strasbourg, Citelum, etc.)
  - **Dalkia** (energy services provider)
  - **EDF Trading** (market operator for the Group)
  - **Framatome** (supplier in the nuclear industry), see the p. 64

Installed capacity and output in 2018(1)

<table>
<thead>
<tr>
<th>CAPACITY</th>
<th>MW</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>63,130</td>
<td>71</td>
</tr>
<tr>
<td>Hydro(2)</td>
<td>20,015</td>
<td>22</td>
</tr>
<tr>
<td>Thermal(3)</td>
<td>6,222</td>
<td>7</td>
</tr>
<tr>
<td>Total(4)</td>
<td>89,367</td>
<td>100</td>
</tr>
</tbody>
</table>

(1) EDF SA data for mainland France. For EDF group data in France (including EDF Renewables), p 46 and 47
(2) Excl. Corsica and the French overseas department, i.e. 437MW in 2018
(3) Excl. Corsica and the French overseas department, i.e. 1,621MW in 2018
(4) Excl. wind capacities of 12MW and including tidal capacity of 240MW

<table>
<thead>
<tr>
<th>OUTPUT</th>
<th>TWh</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>393.2</td>
<td>88</td>
</tr>
<tr>
<td>Hydro(1,2)</td>
<td>46.5</td>
<td>10</td>
</tr>
<tr>
<td>Thermal(3)</td>
<td>10.9</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>450.6</td>
<td>100</td>
</tr>
</tbody>
</table>

(1) Excl. Corsica and the French overseas department, i.e. 1.7TWh in 2018
(2) Output including pumped volumes: the electricity consumption needed for the operation of STEPps amounted 7.3TWh in 2018, resulting in total output after deduction of pumped volumes of 39.2TWh. Including generation from the tidal power on the Rance river of 0.5TWh
(3) Excl. Corsica and the French overseas department, i.e. 4.2TWh in 2018

<table>
<thead>
<tr>
<th>EBITDA 2018</th>
<th>EBITDA (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>€bn</td>
<td></td>
</tr>
<tr>
<td>Unregulated (Generation &amp; supply)</td>
<td>6,327</td>
</tr>
<tr>
<td>Regulated</td>
<td>4,916</td>
</tr>
</tbody>
</table>

(1) RTE is consolidated by the equity method via the CTE holding company
(2) Subsidiaries managed with complete independence, within the meaning of the provisions of the French Energy Code
(3) For more information on the ES activities, please see the p. 140
MARKET DEVELOPMENT IN FRANCE

French market deregulation chronology

Implementation of the NOMEx law of 7 December 2010 to foster competition on the French market

1946: Nationalisation of the electricity and gas sector pursuant to the Law of 8 April 1946


2011: 28 October 2014: publication of the decree that defines the new tariff construction method by costs stacking (ARENH price, cost of supply of the complementary purchases, on wholesale power markets, electricity networks and commercial costs, plus a normal rate of return)
CRE proposal on new tariff, then Ministerial order, who only have an opposition right

On 1 January 2012, ARENH price was set to €42/MWh
For a transitory expected period of 3 years, the ARENH price is set by Ministerial order, after a CRE consultation

2012: 1 July 2011: NOME law entered into force guarantying to EDF’s competitors, for a 15-year transitory period, a regulated and limited access to EDF’s historical nuclear generation capacity (ARENH) to supply their end customers located in France. The available global energy volume cannot exceed 100TWh \(^{(1)}\) per year

2013:

2014: Regulated electricity sales tariffs (TRV):
31 December 2015: end of Yellow and Green regulated tariffs
1 January 2016: The CRE is henceforth in charge of proposing changes to the regulated tariffs

Capacity market mechanism:
1 January 2017: the French capacity mechanism became effective \(^{(2)}\)

2016: ARENH:
14 November 2016: decree relating to the evolution of the ARENH framework agreement to fix the modalities of anticipated resignation by suppliers. Clarification of the “monotonie clause” by the decree of 21 March 2017

2017:

2018: France multi-year energy programme (PPE):
Project published (25 January 2019)

2019:

(1) Excluding supply losses
(2) For more information on the capacity auctions in France and on the impact on EDF’s EBITDA, please see p. 150 - 153

COUNTRY PROFILE
**Main entity:**
EDF Energy, one of the UK’s largest energy companies and the largest producer of low carbon electricity.

3 principal activities:

1. **Customer business:** managing power and gas supply and customer service activities for residential and business customers (4.9 million residential customer accounts at the end 2018).

2. **Generation:** 15 reactors on 8 nuclear power stations (1), 2 coal-fired power stations (2) (o/w one coal-fired and Open Cycle Gas Turbine (“OCGT”)) and onw Combined Cycle Gas Turbine (“CCGT”).

3. **Nuclear New Build business:** in charge of EPR Hinkley Point C (3.2GW) power plant construction project and of EPR Sizewell C (3.2GW) power plant project development in partnership with China General Nuclear Power Corporation (“CGN”), as well as developing proposals for a new nuclear station UK HPR1000 (“Hualong”) by CGN at Bradwell.

The Group is also active in oil and E&P in the North Sea through EDF Production UK (a subsidiary of Edison).

**Strategy:**

- Transition to a lower-carbon economy through the generation of safe, reliable and affordable low-carbon electricity. At the same time, meeting of customer’s needs in an efficient, simple and responsible way, enabling customers to control their energy usage.

- EDF Energy aims to be the energy partner of choice for its customers, doing things better, faster and more cheaply, and making energy easy for customers by applying digital technologies and innovation. Helping customers to make the most of their energy consumption and production, whilst providing excellent service and convenience.

- In generation, EDF Energy seeks to create value through continued operational excellence of existing assets and by developing a portfolio of new investments. Leading the revival of nuclear new build in the UK and extending the lifetime of existing nuclear plants, when safe and commercially viable.

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(1) Including Centrica’s 20% stake
(2) The decommissioning of Cottam power station planned for 30 September 2019, see EDF Energy press release of 7 February 2019
(3) BEIS data of December 2018. Gas share is for residential market only.
(4) Including 1MW of Barkantine CHP
(5) Coal capacity represents transmission entry capacity. Net power including biomass
ITALY – COUNTRY PROFILE

The Italian energy markets is strategic for EDF due firstly to their major significance in the European gas and electricity markets, secondly to their connection to the French markets and the key position in the Mediterranean basin.

Edison:

- The Group owns 97.446% of Edison’s share capital, which is a major player in the Italian gas and electricity markets, and the 3rd largest producer at the national level\(^{(1)}\). Edison’s main activities are:
  - **Power and gas sales**: In 2018, Edison completed the acquisition of the Italian activities of Gas Natural Vendita Italia, increasing by 50% the number of its customers and expanding its market coverage in Central and Southern Italy.
  - **Energy and environmental services\(^{(2)}\)** provided to industrial clients, SMEs and Public Administration. The projects are developed in the form of partnerships or performance contracts with customers. The Market Division for Energy Services regroups the activities of Fenice as well as those of Edison Energy Solutions. In 2018, Fenice acquired Zephyro, specialized in integrated services for energy management, mainly for hospitals.
  - **Electricity generation** from thermoelectric, hydroelectric, solar, wind and biomass sources. In the renewable sector, Edison and EDF Renewables own a 30% stake in partnership with the fund F2i (70%) in E2i Energie Speciali srl (E2i), a company holding 661MW of generation assets, mainly wind. 100% of the energy generated by E2i is transferred to Edison, which uses it for integrated management of its production portfolio.
  - **Hydrocarbon production, procurement and sales**: Edison’s gas supply portfolio is mainly based on long-term contracts.
  - **Gas storage**: through Edison Stoccaggio, 100% subsidiary of Edison.
  - **Gas distribution**: through Infrastrutture Distribuzione Gas SpA.
  - **Gas infrastructures**: partnership in pipeline construction projects, among which ITGI-Poseidon (50%), IGB (50%) and EastMed (50%)\(^{(3)}\).

EDF Renewables\(^{(4)}\) is present in the Italian market, with 424.2MW of gross wind and 76.9MW of gross photovoltaic power.

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\(^{(1)}\) According to 2017 data published by the AEEG, the 2018 data will be available in mid-2019. Edison’s net electricity output in Italy in 2018 represents ~7% of net Italian electricity generation.

\(^{(2)}\) For more information on energy efficiency activities, see p. 169.

\(^{(3)}\) For more information about the Group’s gas infrastructure, see p. 178.

\(^{(4)}\) In April 2018, EDF Énergies Nouvelles’ international subsidiaries were rebranded EDF Renewables (see EDF EN’s press release of 12 April 2018).
BELGIUM AND NETHERLANDS – AREA PROFILE

Key points

The Benelux region features important interfaces with the Franco-German power marketplace. At the start of 2018, the construction of an underground very high voltage power line will provide new links with Germany. The Benelux is an important hub of the European gas market because of its numerous import and transit infrastructures, such as the Zeebrugge hub and its proximity to the Dunkirk terminal.

Main entities:

- **Luminus**
  - EDF majority shareholder (68.63%), through EDF Belgium.
  - 2nd largest player in the Belgian energy market with 10% of the national generation capacity. Total electricity output of 5.2TWh in 2018.
  - Present in renewable energies through 7 hydropower plants.
  - Leader in wind power with 52 onshore wind farms, the group built 24 wind turbines with a total capacity of 62.8MW in 2018.
  - Owning 10.2% (419MW) of the nuclear power plants Tihange 2 and 3, and Doel 3 and 4, Luminus also has 100MW of drawing rights on the French Chooz B nuclear power plant.
  - The company has 2,000 employees, including the recently acquired subsidiaries.
  - EDF is pursuing its expansion strategy in energy services in the HVAC sector (heating, ventilation and air conditioning), by acquiring M. Lemaitre SA via Newelec and Holding Léonard SPRL via Dauvister.

- **EDF Belgium**: wholly-owned by EDF, it holds 50% of the Tihange 1 nuclear plant, or 481MW, representing 2% of Belgian generation capacity. The life span of this power plant has been extended to 2025.

- **Sloe Centrale B.V.** (Netherlands): 4,923 hours of operation in 2018, a very good performance under market conditions that were not very favourable to gas-powered plants.

**2018 key figures**

<table>
<thead>
<tr>
<th>Country</th>
<th>Company</th>
<th>Main activities</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>EDF Belgium</td>
<td>Electricity generation</td>
<td>Nuclear installed capacity: 481MW</td>
</tr>
<tr>
<td>Belgium</td>
<td>Luminus</td>
<td>Electricity generation</td>
<td>Installed capacity: 2,129MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electricity and gas sales</td>
<td>18% gas market share in Belgium</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delivery points: ~1.7 million</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Sloe Centrale B.V.</td>
<td>Electricity generation</td>
<td>Installed capacity CCGT: 870MW</td>
</tr>
</tbody>
</table>

In 2018, EBITDA in Belgium amounted to €141 million

In 2019, Luminus was awarded the Top Employers in Belgium for the 7th consecutive year.

**Did you know?**

In 2018, Luminus' wind capacity increased by 17%, from 376MW in December 2017 to 440MW at the end of 2018. By 2021, the company aims to reach 600MW, making Luminus the leading wind energy company in Belgium.
In North America the group has
- More than 11GW of installed and under construction gross capacity
- Around 52GW of capacity managed on behalf of third parties through O&M (operation and maintenance) or optimization services contracts

Activities in North America:
- Renewable energies: EDF Renewables(1), holds 3.8GW of net capacity (6.9GW installed and under construction gross capacity), mainly located in the USA, and close to 10GW managed for third parties
- Trading: EDF Trading operates in the Northern American markets for electricity (including financial transmission rights) and gas. EDF Trading activities also include trading of RECs(2), biogas, carbon emissions and credits and weather derivatives
- Nuclear: EDF Inc. has 49.99% stake in CENG which operates 5 nuclear reactors with Exelon, with a global capacity of 4,272MW. The NYPSC(3) has established that Ginna and Nine Mile Point nuclear facilities are eligible for the ZEC programme(4). This programme of credits was created in order to preserve the low-carbon nuclear generation installations, which comply with the criteria determined by the NYPSC. Framatome also helps supply electricity to 36 million North American households

Energy supply
- Commercialization of gas and electricity: EDF Trading, through its subsidiary EDF Energy Services, is part of the Top 5 suppliers to non-residential customers in North America, offering all environmental products, natural gas and electricity

Energy services
- Renewables: EDF Renewables(1) manages about 10GW through operation and maintenance contracts on its own or on behalf of third parties
- Trading: EDF Energy Services (100% subsidiary of EDF Trading North America) provides management and optimization services for thermal, wind, PV and hydro power generators
- Local management of energy and energy efficiency: through Dalkia, a 100% subsidiary of the EDF Group, with 448 employees
- Lighting: Citelum provides integrated street lighting systems with turnkey solutions and won several contracts in the USA in 2018

R&D
- EDF Innovation Lab: in 2016, this R&D and Innovation team located in Silicon Valley identified Off Grid Electric (OGE), EDF’s partner in the supply of competitive off-grid solar energy in the Ivory Coast

Did you know?
In 2018, Citelum, EDF’s public lighting subsidiary, installed more than 20,000 LED lights in the city of Albuquerque (New Mexico) and set up an Internet of Things (IoT) infrastructure. Citelum, is committed to providing a better level of lighting, while reducing energy costs, for the next fifteen years

(1) In April 2018, Énergies Nouvelles’s international subsidiaries were rebranded EDF Renewables (please refer to EDF Renouvelables’s press release of 12 April 2018)
(2) Renewable Energy Certificates
(3) NYPSC: New York Public Service Commission
(4) Zero emission credit
The EDF group has operations in 42 out of 50 states and in 5 out of 10 Canadian provinces.

EDF present subsidiaries:
- EDF Inc
- DK Energy US
- EDF Renewables Energy
- EDF Renewables Canada
- EDF Renewables Mexico
- EDF Renewables Energy Services
- EDF Trading North America
- EDF Energy Services
- TIRU
- Citelum

Since 12 April 2018, wind and solar activities, US operations & maintenance projects, as well as projects in Mexico and Canada have been led by EDF Renewables. Projects in the province of Quebec in Canada are registered under the EDF Renouvelables brand.

(1) Acquisition of 75.5% stake in share capital of Framatome in December 2017
**BRAZIL**

- **EDF Norte Fluminense (EDF NF)**
  - The Group owns 100% of **EDF Norte Fluminense**, which has built and operates a CCG\(^1\) with an installed capacity of 826MW.
  - EDF NF owns 51% of the **Sinop Energy Company (SEC)**, which is responsible for the construction and operation of the Sinop hydroelectric facility (408MW) (see slide p. 107).

- **EDF Renewables**: (100% subsidiary of EDF) has been present in Brazil since February 2015, following the acquisition of 80% of the portfolio of Ventos da Bahia, a wind power plant with a total capacity of 182MW.
  - In 2018, EDF Renewables Brazil (a subsidiary of EDF Renewables), commissioned phase 2 (116MW) of **Ventos de Bahia**.
  - EDF Renewables Brazil commissioned the **Pirapora II project (114.9 MWp)**.
  - EDF is also present in Brazil through **the activities of Edison** (Iberitermo subsidiary which operates a CCG of 226MW) and those of **Citelum** (subsidiary 100% owned by EDF dedicated to public lighting). In 2018, Citelum won the lighting contracts for the city of Macapá.

**CHILE**

- In partnership with **AME (Andes Mining Energy)**, the subsidiary of the **EDF Chile Group**, created in 2014, is developing a gas to power project, combining the construction, operation and maintenance of a CCG of around 600MW and of an FSRU\(^2\) type offshore LNG storage and regasification infrastructure.

- **EDF Renewables** is present in Chile with 3 assets: the **Bolero solar power station (146MWp)**, the **Santiago Solar photovoltaic project (115MWp)** and the **Cabo Leones 1 wind farm** with a gross capacity of 115MW which was connected to the grid in June 2018.

- **Citelum** is present in Chile on the public lighting market. In 2018, in Independencia, in the Province of Santiago, Citelum installed the city’s lighting works.
**CHINA – COUNTRY PROFILE**

### Key points

- The EDF group is one of the largest foreign investors in the electricity sector in China, with interests in thermal power plants for a total net capacity of 2,525MW(1).

- As the first foreign company to invest in a project to build and operate a nuclear power plant in China, EDF owns 30% of TNPJVVC, which aims to finance, build, commission and operate two EPR nuclear reactors(2). Unit 1 was the first EPR in the world to enter commercial service on 13 December 2018.

- In January 2018, EDF signed two 30-year concession contracts to build and operate a nuclear power plant in Lingao (Henan) and a cooling network for the air conditioning of hotels located in a tourist area in Sanya (Hainan). The two projects are under construction.

- EDF Renewables acquired in July 2016 a majority share (80%) in UPC Asia Wind Management (AWM), which develops and builds wind power projects in China. At the end of 2018, EDF holds an interest in 6 wind farms for a net installed capacity of 140.2MW(1). In February 2018, EDF Renewables created a joint venture with ACC (AsiaClean Capital) to develop solar roofing solutions for industrial customers.

- In May 2016, EDF and Datang signed an agreement to create a JV (65% owned by EDF) for the construction and operation of the Sanmenxia (Henan) urban heating network. The network went into operation in November 2016.

- EDF owns 49% of FPC, a joint-venture with a subsidiary of Datang, which built and operates the “ultra-supercritical” coal-fired power plant of Fuzhou. This technology ensures better performance (~44% for Fuzhou) and a limited environmental impact. The first unit was commissioned in late 2015 and the second in April 2016.

### Thermal and nuclear generation capacity

- **DSPC**
  - SANMENXIA 2 Project
  - 2 x 600MW coal SC(4)
  - EDF: 35%

- **TNPJVVC**
  - TAISHAN(2)
  - EPR 2 x 1,750MW nuclear (under construction)
  - EDF: 30%

- **SZPC**
  - 3,060MW of total capacity
  - 3 coal-fired power plants
  - EDF: 19.6%

- **Fuzhou (FPC)**
  - 2 x 1,000MW coal USC(4)
  - EDF: 49%

### Partnership with CGN

- **On 29 September 2016** EDF and CGN signed the final contracts for the Hinkley Point C power plant project(3). EDF’s stake in Hinkley Point C is 66.5% and CGN’s is 33.5%. An agreement covering the development of the UK HPR1000 (Hualong One) technology at Bradwell, United Kingdom was also signed at that time. In addition, EDF is working with CGN to advance a project similar to Hinkley Point C, a 3.2GW EPR construction project at Sizewell.

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(1) Data in proportion to EDF's equity

(2) For more information on the Taishan 1&2 EPR project, see p. 70

(3) For more information on the Hinkley Point C EPR project, see p. 67

(4) SC = “supercritical” technology, USC = "ultra-supercritical" technology

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**Did you know?**

EDF led the design, construction and commissioning of the Daya Bay nuclear power plant (2 x 1,000MW) and assisted the Chinese group CGN in the construction of the Ling Ao power plant (4 x 1,000MW). Today, EDF provides support to the CGN group in the operation of its entire fleet.
In March 2018, the EDF group and the Indian energy company NPCIL(1) signed an industrial agreement for the construction of 6 EPRs on the Jaitapur site in India. With a total power of about 10GW, Jaitapur will be the largest nuclear project in the world(2).

Citelum, an EDF subsidiary specialised in street lighting, is also present in India where it manages 178,000 luminous points in the city of Ahmedabad and will renovate the lighting infrastructure of the city of Noida, in partnership with Tata Projects Ltd.

Solar photovoltaic sector: In 2018, the Group has a total of 207MWp of gross solar capacity in operation in India, through EDEN, the joint venture created in 2016 by EDF Renewables and EREN Renewable Energy.

Wind power sector: EDF Renewables, a wholly owned subsidiary of EDF, has taken a position in onshore wind energy since 2016, with the acquisition of 50% of SITAC Wind Management and Development, an Indian wind power company. At the end of 2018, the Group’s total installed wind power capacity is 82MW net. In September 2018, a portfolio of 300MW of wind projects were won in a government call for tenders.

In October 2018, EDF deployed its microgrid offer throughout Southeast Asia following the inauguration of the microgrid demonstrator “MASERA” in partnership with local universities.

At the end of 2018, the Group owns 40% of Nam Theun 2 Power Company (NTPC), which owns the Nam Theun 2 Hydropower Complex (1,070MW installed capacity). Built by EDF under a turnkey contract, the plant represents approximately 18% of the country’s installed capacity. The other shareholders are the Thai company EGCO (4)(35%) and the Laotian society LHSE (25%). NTPC company operates the power plant on a 25-year concession contract concluded with the government of Laos.

In December 2018, part of the stake in Nam Theun Power Company (NTPC) was allotted to dedicated assets at that date, the rest will be allotted in 2019.
The Group wishes to develop on the continent of Africa by assisting countries with high-energy demand, on a selective basis appropriate to each geographical region, and by building sustainable and multi-industry partnerships. EDF is also intensifying its action in the supply of competitive off-grid energy.

South Africa

- Since 2007, EDF has a subsidiary in Johannesburg, focused on reviving the South African nuclear program
- **Wind energy sector:** Since 2011, EDF Renewables has been developing in the wind energy market and operates three wind farms with a gross capacity of 110.6MW through its 94%-owned EDF Renewables South Africa subsidiary
- In December 2018, EDF acquired 30% of GIBB POWER, a subsidiary of the South African group GIBB Engineering and Architecture, in order to increase its activity in thermal engineering, hydraulics, transportation and distribution services
  
Morocco

- In 2018, EDF won a tender to renovate public lighting installations in the city of Fez.
- **Wind energy sector:** EDF is developing the Taza wind farm (150MW) in partnership with Mitsui & Co. Since the acquisition of Futuren in 2017, the Group’s wind gross capacity in this country has reached 50.4MW

Egypt

- **Solar energy sector:** EDF Renewables entered in Egypt by partnering with Egypt’s group Elsewedy Electric to develop two photovoltaic plants (130MWac of total installed capacity) in the Benban solar complex (1.8GWac)

Cameroon

- EDF will build and operate through its 40% stake in Nachtigal Hydro Power Company (NHPC) alongside IFC, the State of Cameroon, Africa50 and STOA, the Nachtigal hydroelectric dam (420MW)

Ivory Coast

- In partnership with SIFCA, the Ivorian agro-industrial group and Meridiam, EDF is developing the "Biovéa" biomass plant project (2 x 23 MW). The investment decision is targeted in the first half of 2019

Off-Grid

- EDF has fifteen years of experience in the field of “Off-Grid” (decentralized energy). The Group partners with innovative start-ups to provide energy and services to a rural clientele of several thousand people in Côte d’Ivoire (partnership with Off Grid Electric), Ghana (partnership with CH Group), Senegal, and Togo, according to their income and needs.
- **Kenya:** In 2018, EDF joined the shareholders of the Kenyan company SunCulture to sell, install and maintain solar pumps for rural households
- **Senegal:** EDF owns 70% of ERA, an electrification operator in the rural area of Kaffrine-Tambacounda-Kédougou (25% of Senegalese territory). Assisted by AFD, ERA now supplies a portfolio of around 6,000 clients.

**Did you know?**

At the end of 2018, EDF rewarded the winners of the **EDF Pulse Africa** Awards, accompanying committed innovators for energy development. The 1st Prize, was awarded to SAVANNA CIRCUIT TECH, which is developing a mobile cooling system for milk powered by solar energy.

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(1) See press release of 8 October 2018
(2) Agence Française de Développement
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<td>MARKET DATA</td>
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<td>APPENDICES</td>
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</table>
EDF: UNIQUE EXPERTISE AND KNOW-HOW IN THE NUCLEAR INDUSTRY

EDF, the world’s leading nuclear operator

- 58 reactors in France (63.1GW)
  - 1 Reactor under construction
  - 1 Reactor in operation in France (China / Taishan)
  - 2 Reactors under construction
  - 1 Reactor under construction in the UK (8.9GW)

EDF, global expertise

- EDF manages the entire lifecycle of nuclear generation facilities: design, operation and decommissioning
  - EDF is the world’s leading nuclear operator with a standardised nuclear fleet of 58 reactors in France and 15 reactors in Great Britain
  - EDF is investing to continue the operation, safely, of its reactors beyond 40 years, a guarantee of the competitiveness of electricity generation in France
  - Construction of EPR-type reactors throughout the world (France, China, Great Britain) and development of an optimised version of the EPR (EPR 2) for the renewal of the nuclear fleet by 2030
  - EDF is present in the French and international markets for the decommissioning of nuclear power plants and radioactive waste treatment facilities

To operate the existing nuclear fleet beyond 40 years, EDF plans to invest €45 billion over the period 2014-2025, as part of the “Grand Carénage” programme.

The integration of Framatome, originating from the AREVA NP subsidiary, into the EDF group and the pooling of EDF and Framatome engineering teams in a joint subsidiary Edvance, are the major milestones in the re-engineering of the French nuclear sector, for new projects in France and abroad.

EDF and its subsidiary Cyclife have won their first contracts on the international markets of nuclear decommissioning and waste treatment facilities.

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(1) AIEA (Agence Internationale de l’Énergie Atomique), Nuclear power reactors in the world, 2017 edition
(2) In 2013 euros (or €48 billions in current euros)
(3) Please refer to Framatome’s press release of 4 January 2018
(4) On 17 May 2017, the EDF group’s Board of Directors approved the creation of the company Edvance, bringing together EDF’s and AREVA NP’s engineering expertise around the nuclear island
(5) Please refer to the press releases published by EDF on 6 February and 21 February 2018
World nuclear capacity expected to expand over the next quarter century

Today, nuclear power represents ~11% of global output. By 2040, it is expected to reach ~10% of global output. The world’s primary energy demand is expected to grow by 25% by 2040. The electricity share in the world’s final energy consumption is expected to reach 24% in 2040, compared to 19% in 2017.

The share of nuclear power in global output is expected to stay relatively stable between 2017 and 2040, at 10%.

Unique positioning on global new nuclear build growth

In 2040, IEA(1) expects ~10% of global output to be nuclear power.

1st Unit: Start of commercial operation on 13 December 2018
2nd Unit: Start up expected in 2019 (2)
Fuel loading: Objective end of 4th quarter 2019, the start up of the reactor (3)
Final contracts signed by EDF, CGN and the UK Government on 29 September 2016
First pouring of the slab concrete of the reactor building of the Unit 1 on 11 December 2018
Commissioning of the first reactor expected in 2025

In 2016, EDF also signed two other agreements with CGN concerning studies on two nuclear construction projects in the UK, Sizewell C and Bradwell B (4).
In 2018, EDF and the Indian company NPCIL signed an Industrial Way Forward Agreement for the construction by NPCIL of six EPRs at the Jaitapur site in India (5). On December 14, 2018, EDF submitted a complete and packaged technical and commercial offer.
EDF Group (EDF SA, Framatome, Edvance) drives the French nuclear sector with the following goals:

- Make project delivery and management more effective by harnessing each company’s core strengths and the synergies expected from Framatome’s integration into EDF group and the pooling of the EDF and Framatome engineering teams as part of the joint subsidiary Edvance.
- Enhance the competitiveness and appeal of our technologies and services through complementary expertises.
- Provide development opportunities for the French nuclear sector by ensuring ever greater engineering and business expertise in integrated projects.

A promising market and active projects on every continent.
FRAMATOME, A MAJOR INTERNATIONAL PLAYER IN THE NUCLEAR INDUSTRY

An international presence

Benchmark supplier in the nuclear industry

Designer and supplier of nuclear steam supply system and nuclear equipment, services, fuel and control systems for high levels of safety and performance

6 business areas

- **Installed base**: Maintenance and engineering services for existing nuclear fleets and fleets under construction
- **Fuel**: Develop, design, license and manufacture fuel assemblies and associated services
- **Large Projects**: Contribute to new build construction projects
- **Components**: Design and produce heavy and mobile equipment for the nuclear island
- **Instrumentation & Control**: Design and manufacture of instrumentation and control solutions for the safety of the nuclear boiler
- **Engineering and Design Authority**: Development, design and licensing of boilers and associated services

€3.3bn in sales\(^{(1)}\)
€12.6bn backlog\(^{(1)}\)
56 sites in 18 countries\(^{(1)}\)
14,500 employees\(^{(1)}\)

\(^{(1)}\) Data provided at Framatome’s own scope, end of 2018
EPR, A SAFE AND HIGH-PERFORMING REACTOR

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

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

- **Radioprotection**
  - At least 40% cut in collective annual exposure

- **Environment**
  - Very important reduction in radioactive waste and gaseous and liquid discharges
FLAMANVILLE 3 EPR (1,650 MW)

Construction progress at end of March 2019
- Main civil engineering work completed
- Electromechanical assembly nearly finished, the remaining activity being carried out as the system performance tests are being performed
- 67% completion of building finish work (1)
- 51% progress of facility transfers to the operator

System performance tests
- 6 January 2018: end of “cold” tests (filling primary circuit with pressurised water) conducted, including successful completion of the leak-tightness test of the reactor’s primary circuit (2)
- 3 April 2018: end of reactor building pressurisation operations, known as the “containment building pressure test” (3)
- From 22 February 2019 to 22 March 2019: 1st phase of the “hot” tests with more than 95% of the test criteria testing compliant

Reworking of secondary system welds
In July 2018 (4), EDF decided to repair 33 welds that were found to have quality deficiencies and to completely rework 20 welds that did not meet its break preclusion requirements (5); moreover, EDF proposed a specific justification method to the ASN for 8 welds located in the reactor containment building structure.

On 3 December 2018, EDF submitted to ASN a technical file presenting the procedures for repairing and upgrading the main secondary circuit welds, which had showed deficiencies with respect to the break preclusion requirements, as well as for the specific justification method for the 8 welds located in the reactor containment building structure.

On 9 April 2019, ASN convened its Permanent Group of Experts for nuclear pressure equipment (GP ESPN) as part of the investigation into quality deviations affecting the welds located on the main steam transfer pipes covered by the break preclusion principle of the Flamanville 3 EPR. EDF has reviewed the position of the Permanent Group of experts made public on 11 April 2019. It is continuing its discussions with ASN, which will decide in a few weeks’ time on the follow-up to the investigation of this case.

Schedule and cost (6)
The recommendations made and the solutions suggested by the Permanent Group could have an impact on the commissioning schedule and construction costs.
A detailed update of the schedule and construction cost of the Flamanville EPR will be given after the ASN ruling has been published.
As a precautionary measure, EDF requested on 12 March 2019 the amendment of the construction authorisation decree for Flamanville 3 with a view to extend the deadline.

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(1) Finish work aimed at a high quality standard for the facility (cleanliness, paint, weather-stripping), in accordance with the standard of an operating nuclear power plant.
(2) See EDF press releases dated 9 October 2017 and 8 January 2018
(3) See EDF press release dated 10 April 2018
(4) See EDF press release dated 25 July 2018
(5) See significant incident report (30 November 2017) on correct application of “high quality” requirements
(6) See EDF press release dated 11 April 2019
# HINKLEY POINT C: PROJECT OVERVIEW

<table>
<thead>
<tr>
<th><strong>Location</strong></th>
<th>Bridgwater, Somerset, UK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology</strong></td>
<td>Two EPR reactors</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>3.2GW (2 x 1.6GW)</td>
</tr>
<tr>
<td><strong>Operating life</strong></td>
<td>60 years+</td>
</tr>
<tr>
<td><strong>Responsible Designer</strong></td>
<td>EDF</td>
</tr>
<tr>
<td><strong>Main contractors</strong></td>
<td>Framatome, GE, Bouygues/Laing O’Rourke, Alliance of Cavendish Nuclear/Balfour Beatty/Altrad/NG Bailey and Doosan Babcock</td>
</tr>
<tr>
<td><strong>Contract for difference</strong></td>
<td>CID strike price fixed over 35 years: £201292.50/MWh or £201289.50/MWh if a positive FID is taken for Sizewell C (indexed to British inflation)</td>
</tr>
<tr>
<td><strong>Investors’ participation</strong></td>
<td>EDF Energy: 66.5% ; CGN: 33.5%</td>
</tr>
<tr>
<td><strong>Economic benefits</strong></td>
<td>25,000 jobs on site during construction, with 5,600 people on site at peak construction – 4,500 jobs in France</td>
</tr>
</tbody>
</table>
Reminder of the key points on Hinkley Point C project

- "J0" milestone: Complete the common raft (pouring of the nuclear safety concrete) for Unit 1 scheduled for mid-2019
- Project completion costs estimated at £19.6 billion in 2015 sterling, an increase of £1.5 billion in 2015 sterling compared to the initial cost, subject to the implementation of the action plans necessary to achieve this objective
- Commissioning of Unit 1 scheduled end-2025. Risk of deferral of delivery (COD) estimated at 15 months for Unit 1 and 9 months for Unit 2. The materialisation of this risk would entail an additional cost of around £0.7 billion in 2015 sterling

Project progress in line with “J0” target at this stage:
- Successful completion of the design on 26 September 2018
- Achievement of the 4 project goals set for 2018:
  - Completion of Unit 1 pre-stressing gallery construction – work on Unit 2 has also begun
  - Completion of Unit 1 “Deep dig”, which will contain the 54m tall water pumping station
  - Handover of the design package for Unit 1 Nuclear Island Common Raft, enabling to start work on site
  - First pouring of the concrete for the Unit 1 Nuclear Island Common Raft

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(1) Please refer to press release published by EDF on 3 July 2017
(2) Given the long-term horizon of investment in the HPC project, the EDF Group is deploying a progressive strategy to hedge the risk of appreciation of the pound in its investment HPC.
(3) Excluding interim interests and excluding forex effect versus the reference exchange rate for the project 1 Sterling = 1.23 Euro. The exchange rate on 31 December 2018 was 1.12 euro
(4) Additional costs net of action plans
## SIZEWELL C: PROJECT OVERVIEW

<table>
<thead>
<tr>
<th>Location</th>
<th>Sizewell, East Anglia, UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Two UK EPR reactors</td>
</tr>
<tr>
<td>Capacity</td>
<td>3.2GW</td>
</tr>
<tr>
<td>Operating life</td>
<td>60 years+</td>
</tr>
<tr>
<td>Design</td>
<td>European Pressurised Reactor replicated on HPC design, approved for construction in UK in 2012, UK required design changes achieved and frozen in 2018. EDF provides Responsible Design</td>
</tr>
<tr>
<td>Key milestones</td>
<td>Stage 3 DCO(^{(1)}) consultation Jan-March 2019 FID in 2021</td>
</tr>
<tr>
<td>Shareholder’s structure</td>
<td>Pre-FID: EDF Energy: 80%; CGN: 20% At FID, EDF Energy plans to sell the majority of its shares to external partners and does not intend to consolidate the project after FID</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Development Consent Order
TAISHAN 1 & 2 (EDF 30%)

Progress of the construction as of 30 April 2019

- **Unit 1**
  - Authorisation to fuel loading on 10 April 2018
  - First chain reaction on 6 June 2018
  - First grid connection on 29 June 2018
  - Commercial operation started on 13 December 2018

- **Unit 2**
  - End of the primary circuit hydraulic testing of the modifications on the command control on 12 July 2018
  - End of “hot functional tests” on 25 January 2019
  - Fuel loading on 16 April 2019

Next steps communicated by CGN

- **Unit 2**
  - Commercial operation in 2019

2 EPR of 1,750MW

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(1) The purchase price of electricity of Taishan has been approved to RMB435/MWh (tax inclusive) (Cf. CGN Press release of 28 March 2019)
The EDF Group has been involved in civil nuclear cooperation between France and India since 2010, within the framework of bilateral agreements signed between France and India. Jaitapur is the flagship project of this collaboration. 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 located in the state of Maharashtra 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 since 2016.

- On Saturday, 10 March 2018, Jean-Bernard Lévy, EDF Chairman and CEO, and Satish Kumar Sharma, Chairman and MD of Nuclear Power Corporation of India Limited (NPCIL), the government-owned Indian energy company, signed an Industrial Way Forward Agreement- IWFA for the implementation of six EPR reactors at the Jaitapur site in India. Jaitapur is set to be the biggest nuclear project in the world. The agreement defines the project’s industrial framework, the roles and responsibilities of the partners, as well as a planned timetable for the next steps.

- EDF is expected to act as supplier of the EPR technology. EDF would undertake all engineering studies and all component procurement activities for the first two reactors. For the other four units, the responsibility for some purchasing activities and studies could be assigned to local companies. EDF would also provide NPCIL with its valuable experience in the construction of EPR reactors.

- In its capacity as owner and future operator of the Jaitapur Nuclear Power Plant, 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 agreed schedule in the IWFA, signed on March 10 by Mr. Levy, in the presence of French Republic President, EDF deliver to NPCIL last December 14, 2018 a complete conditional offer. The convergence process based on this technical-commercial offer is launched with NPCIL.

- The 2019 objective for NPCIL and EDF is the signature of a definitive and binding agreement (General Framework Agreement), and the launch of the Front End Engineering and Design work.
71.7% (1) of French power generation in 2018

58 reactors in operation with a capacity of 63,130MW

19 sites

A unique technology, PWR (Pressurised Water Reactors), 3 series:

- 900MW 34 reactors 31GW with an average age of 37 years
- 1,300MW 20 reactors 26GW with an average age of 30 years
- 1,450MW 4 reactors 6GW with an average age of 18 years

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

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

(1) The total French electricity output reached 549TWh in 2018 (Bilan électrique 2018 of RTE)
Nuclear power plant without air cooling

**Fuel building**
- Houses a pool in which the spent fuel waiting to be transferred for reprocessing is stored, and the new fuel waiting to be loaded into the reactor.

**Reactor building**
- Houses all the equipment needed to allow nuclear power to transform water into steam in steam generators. This is called the “primary” circuit. The steam is sent to the turbine in the machine room.

**Auxiliary nuclear building**
- Houses all the circuits that ensure a reactor’s safe operation.

**Pumping station**
- Collects the sea water used to cool part of the circuits.

**Condenser**
- At the turbine outlet, the steam from the cooling circuit is transformed back into water by means of a condenser containing cold water from the sea or a river. The cold water withdrawn from the environment never comes into contact with other water circuits. This is called the “cooling” circuit.

**Transformer**
- Raises the voltage of the electricity generated by the alternator so that it can be transmitted through very high voltage lines.

**Machine room**
- Houses the turbo-alternator generator that uses the steam produced in the reactor building by the steam generators. This steam rotates a turbine that drives a generator. The generator produces the electricity.
The outages cycle of nuclear reactors

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

Types of planned outages

- Two types of planned outages are alternated at the end of each generation campaign:
  - Ordinary outage for refueling only (ASR): unloading spent fuel and refueling fresh fuel. **Standard period ~35 days**
  - Partial inspection (PI): refueling and maintenance. **Standard period ~70 days**, varying according to programs for maintenance work
  - 10-year inspections (VD): **standard period ~110 days**, varying according to programs for safety upgrades and maintenance work
  - Regulatory obligations (safety tests and various controls), adapting safety to latest standards, maintenance work
  - Detailed examination of the main components relating to the safety of the facility (reactor vessel, containment building) and realisation of the upgrades aimed to reinforce the safety level of the facility
A SEASONAL SCHEDULE OF PLANNED OUTAGES

- A minimum number of planned outages during winter
- Necessary balance between 12-month and 18-month generation cycles

2018 Year: number of reactors in planned outage per week seen from the 1st January 2018

The planning refers to a specific instant $t$
HISTORICAL AVAILABILITY OF THE FRENCH NUCLEAR FLEET

Did you know?

The $K_d$, or "availability factor", represents the available energy over the maximum theoretical energy corresponding to the maximum capacity all along the year. The winter $K_d$ is the availability factor measured between the 1st of December and the 14th of February of the next year, when the consumption reaches its maximum levels.

The $K_u$, or "utilisation factor", is the produced energy over the available energy. It reflects environmental, social and regulatory constraints, the consumption profile of customers, the supply of system services and the optimisation.

\[ K_p = K_d \times K_u \]

The multiplication of the $K_d$ and the $K_u$ leads to the $K_p$, or "load factor", defined as the generated energy compared to the maximum theoretical energy.

---

$K_d$ and $K_u$ (%)

Winter $K_d^*$ (%)

(*) from 1st December (N) to 14 February (N+1)

(1) Excluding the outages for regulatory reasons such as outages relating to the irregularities found at Creusot factory, that are included in $K_u$ factor.
**CHANGE IN LOAD FACTOR AND NUCLEAR OUTPUT IN FRANCE**

### Annual load factor of nuclear fleet in France

<table>
<thead>
<tr>
<th>Year</th>
<th>Load Factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>77.6</td>
</tr>
<tr>
<td>2006</td>
<td>77.4</td>
</tr>
<tr>
<td>2007</td>
<td>75.6</td>
</tr>
<tr>
<td>2008</td>
<td>70.5</td>
</tr>
<tr>
<td>2009</td>
<td>75.3</td>
</tr>
<tr>
<td>2010</td>
<td>73.8</td>
</tr>
<tr>
<td>2011</td>
<td>73.0</td>
</tr>
<tr>
<td>2012</td>
<td>73.0</td>
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<tr>
<td>2013</td>
<td>69.2</td>
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<tr>
<td>2014</td>
<td>75.4</td>
</tr>
<tr>
<td>2015</td>
<td>71.1</td>
</tr>
<tr>
<td>2016</td>
<td>68.6</td>
</tr>
<tr>
<td>2017</td>
<td>71.1</td>
</tr>
<tr>
<td>2018</td>
<td>68.6</td>
</tr>
</tbody>
</table>

### Net output of PWR\(^{(1)}\) fleet in France

<table>
<thead>
<tr>
<th>Year</th>
<th>TWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>417</td>
</tr>
<tr>
<td>2003</td>
<td>421</td>
</tr>
<tr>
<td>2004</td>
<td>427</td>
</tr>
<tr>
<td>2005</td>
<td>429</td>
</tr>
<tr>
<td>2006</td>
<td>428</td>
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<td>2007</td>
<td>418</td>
</tr>
<tr>
<td>2008</td>
<td>418</td>
</tr>
<tr>
<td>2009</td>
<td>421</td>
</tr>
<tr>
<td>2010</td>
<td>408</td>
</tr>
<tr>
<td>2011</td>
<td>405</td>
</tr>
<tr>
<td>2012</td>
<td>404</td>
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<td>2013</td>
<td>416</td>
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<td>2014</td>
<td>417</td>
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<tr>
<td>2015</td>
<td>384</td>
</tr>
<tr>
<td>2016</td>
<td>379</td>
</tr>
<tr>
<td>2017</td>
<td>393</td>
</tr>
<tr>
<td>2018</td>
<td>384</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Pressurized Water Reactor
EDF has completed the exhaustive review of the manufacturing files for components from the Creusot Forge factory, installed on its nuclear reactors in operation. This review gives rise, for each reactor, to the writing of a summary report which has been transmitted to the ASN for review. As before each reactor restart, the ASN then decides on its authorisation to restart. The schedule for sending the files has been agreed with the ASN; it ran from September 2017 until the end of 2018.

Several steps are required in the sending of a summary report for each reactor: the first step aims at the inspection of all the manufacturing files concerning forged parts intended for the nuclear fleet, to identify the findings. The experts then analyse these findings in order to characterise them, that is to say, to determine during technical reviews whether they are classified as deviations. These technical reviews have now been finalised for all the manufacturing files of the fleet in operation to be analysed: 100% of the files were examined, with no major discrepancies discovered (other than the one already processed and cleared (2) for the steam generator at Fessenheim 2). Based on the technical reviews, a summary report is then written for each reactor by Framatome and checked by EDF before being sent to the ASN for review.

As of 1st April 2019, the 58 summary reports (ie all) sent to the ASN have been investigated and cleared by it, which allow all the reactors to receive their authorisation to restart.

EDF also responded in 2018 to all the requests included in ASN's decision of 15 September 2017. These included an analysis of the equipment files produced by Creusot Loire. No significant difference was detected.

(1) As of 4 January 2018, New NP, a subsidiary of AREVA NP, has become Framatome, a company whose capital is owned by the EDF group (75.5%), Mitsubishi Heavy Industries (MHI - 19.5%) and Assystem (5%). Please refer to the press release published by Framatome on 4 January 2018.

(2) On 12 March 2018, ASN lifted its suspension of the pressure test certificate of a steam generator N. 335 installed on reactor 2 of the nuclear plant of Fessenheim. The ASN considers that the anomaly during the forging of a shell of this steam generator did not compromise its serviceability and that its compliance with the regulations was thus demonstrated.
Security

- 2018 is a record year in terms of accident frequency rate\(^{(1)}\) for service providers (AFR service providers) which continues to fall (2.4 in 2018 vs 2.7 in 2017)

Safety

- 2018 is a record year (historic low) in terms of Automatic Reactor Outages (ARO)

Radiation protection

- Satisfactory results in 2018 with the continuation of actions aimed at reducing collective dosimetry

Environment

- Very satisfactory results were obtained in terms of the environment in 2018

\(^{(1)}\) Number of accidents with work stoppage per 1 million hours worked

Cattenom nuclear power plant, planned outage of the generation unit number 1, maintenance work on the turbine in the machine room.
OPERATIONAL PERFORMANCE OF THE NUCLEAR FLEET IN 2018 (2/2)

2018: a good year in terms of safety and radiation protection

Number of automatic reactor outages (1)

2018: lowest historical result

Number of injured on critical risks (3)

Accident frequency rate (AFR) (2)

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(1) Automatic reactor outage is a safety and protection system of a reactor. This is an important indicator in terms of safety which measures the quality and rigour of reactors’ operation.

(2) Number of accidents with work stoppage per million hours worked of the nuclear generation division in France.

(3) Accumulated lifting accidents, electrocution and fall height of the nuclear generation division in France.
EXISTING NUCLEAR FLEET AND GRAND CARÉNAGE PROGRAMME

- Industrial strategy to continue the operation of plants after 40 years for a competitive energy mix
  - 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) accounted as of 1 January 2016
  - Strategy confirmed by the guidelines of the multi-year energy plan project 2019-2023 / 2024-2028

- Grand Carénage programme
  - Programme cost over the 2014-2025 period: total investments costs of an initial amount of €2013 55bn revised to €2013 45bn(1) mainly through project optimisation allowing a reduction and a postponement beyond 2025

(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 €2013100bn for the 2014-2030 period, the investment-expenditures estimated at €201374.73bn should be distinguished from the operating expenditures estimated at €201325.16bn. Within the €201374.73bn of investment expenses between 2014 and 2030, €201355bn 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.
By integrating all of the investments for the French nuclear fleet, the “Grand Carénage” programme responds to three major challenges:

- The renewal and replacement of major components at the end of their technical lifetime, in particular the steam generators. These are the exceptional maintenance operations.

- Carrying out the modifications needed to improve safety (including post-Fukushima modifications and Decennial Visits).

- The demonstration of equipment qualification after 40 years. These are studies or tests to ensure that “qualified” equipment, that is, those capable of operating under particularly difficult conditions, retain this capability after 40 years of operation.

The works are carried out mainly during maintenance shutdowns, but also during certain periods of operation of the installations.

An operational programme 5 years after its launch:

- The 3rd ten-year inspections for the 1,300MW series began in 2015 and will be completed by 2025.

- More than 3/4 of the 4th ten-year inspections for the 900MW series will be completed by 2025, the first of which will take place at Tricastin in 2019.
As a major industrial program, Grand carénage incorporates all the investments made by EDF on its French nuclear fleet. It is now made up of 22 investment projects (of which 20 are active today).

Each project covers the design and construction phases of all EDF nuclear power plants.
SOME LARGE PROJECTS IN 2018

The first two backup diesel generators were put into operation at Saint Laurent

Leak tightness reinforcement of Flamanville 1’s reactor containment building

The restart of the Paluel 2, Cattenom 2 and Saint-Alban 2 units after the third ten-year inspections

The completion of the “Tranche en marche” work on the first-in-series unit for the 4th ten-year inspection of the 900 series, at Tricastin 1

The continuation of the major components replacement program at the end of 2018: alternator stators (47 renovated/49 units to be renovated), main transformers (126 transformer poles replaced/174), filter drums, condensers, heaters, etc. And 28 units of the 900MW series out of a total of 34 units have had their steam generators replaced.
10-YEAR INSPECTIONS OF THE NUCLEAR FLEET

In 2019, there will be one 3rd and one 4th 10-year inspections of 900MW reactors.

In 2020, there will be one 3rd and two 4th 10-year inspections of 900MW reactors.

(1) Forecast data as of 30 January 2019
(2) Of which 3rd 10-year inspection (1,300MW) of Paluel 2 started in 2015 and 3rd 10-year inspection (900MW) of Gravelines 5 started in 2016
(3) Of which 3rd 10-year inspection (900MW) of Cruas 2 started in 2017, excluding 3rd 10-year inspection continuation (1,300MW) of Paluel 2 started in 2015 and recoupled in March 2018
Did you know?

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

An AGR has a graphite moderator helping to control the reaction. The reactor is encased in a steel-lined pre-stressed concrete pressure vessel several meters thick which also acts as a biological shield. The steam generator in which water is heated is situated inside the pressure vessel. An AGR uses enriched uranium dioxide encased in a stainless steel pin for its fuel and CO$_2$ as its coolant.

A PWR is contained inside a steel pressure vessel filled with pressurised water which acts as the moderator and coolant. The fuel used is enriched uranium dioxide and is contained in zirconium alloy tubes.
KEY CHARACTERISTICS OF EDF ENERGY’S NUCLEAR FLEET

A nuclear fleet with an average age of 34 years

- Total power generation capacity of 8.9GW
- An output of 59.1TWh in 2018

Nuclear safety is the over-riding priority

- Adequacy of each station confirmed at each statutory outage by the Office for Nuclear Regulation (ONR) that has to provide consent to restart after each outage
- Periodic safety review (PSR) undertaken every 10 years, also requiring ONR acceptance

Delivering life extensions

- Life extension subject to review of safety, technical and economic factors
- The lives of the AGRs(2) have been further extended by an average of 8 years (relative to the planned closure dates at British Energy’s acquisition in 2009)
- It is anticipated that Sizewell B PWR(2) can be extended by 20 years

(1) Unit Capability factor
(2) For more information about EDF Energy’s nuclear fleet and about the AGR and PWR technologies RAG and REP, see p. 86
Hartlepool / Heysham 1 were extended by 5 years in 2010 and a further 5 years in 2016, Hunterston B/ Hinkley Point B by 7 years in 2012, Heysham 2 / Torness by 7 years in 2016 and Dungeness B by 10 years in 2015

An average eight-years extension across the AGR\(^{(1)}\) fleet (relative to planned closure dates at British Energy acquisition in 2009)

\(^{(1)}\) For more information about EDF Energy’s nuclear fleet and about the AGR and PWR technologies RAG and REP, see p. 88
CONTINUOUS IMPROVEMENT IN OPERATING CONDITIONS AT EDF ENERGY

Number of automatic reactor trips

Industrial safety accident rate(1)

Average annual collective dose per reactor

Individual annual dose above 15mSv

(1) Number of accidents with work stoppage (lost time injuries and restricted time injuries) per million hours worked: ISA (Industrial Safety Accidents) and CISA (Contractor Industrial Safety Accidents) indicators
STAGES OF THE NUCLEAR FUEL CYCLE IN FRANCE
THE PLANT Dismantling CYCLE: 3 KEY STEPS

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

- **Dismantling excluding the reactor building**
  - The second phase starts after the obtaining of the decree on final shutdown and dismantling (MAD/DEM) and consists in dismantling all equipment and buildings (with the exception of the reactor building), as well as the packing and removing of all waste to appropriate storage facilities

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

The duration of a Pressurised Water Reactor (PWR) is 15 years starting from the decree on the final shutdown and dismantling (MAD/DEM). The duration of the operations may vary for other technologies (NUGG, LWR, FNR) according to the complexity of works that have to be realised.
EDF NUCLEAR PLANTS BEING DISMANTLED IN FRANCE

1 pressurised-water reactor (PWR)

1 heavy-water reactor (HWR)

6 natural uranium/graphite gas reactors (NUGG)

1 fast-neutron reactor (FNR)

(1) MAD/DEM decree: decree on the final shutdown and dismantling (Décret de Mise à l’Arrêt Définitif et Démantèlement)
(2) INBE decree: decree on nuclear spent fuel storage facility (Installation Nucléaire de Base d’Entreposage) (partial dismantling authorisation of a nuclear facility)
THE FIRST PRESSURISED WATER REACTOR UNDER DECOMMISSIONING: CHOOZ A

Commissioned in 1967 and in operation until 1991, Chooz A is the first Pressurised Water Reactor (PWR) to be decommissioned. On 8 March 2017, the site entered its final phase for the segmentation of the reactor vessel.

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>• Closure of the facility, removal of fuel and emptying of main circuits</td>
</tr>
<tr>
<td>2007</td>
<td>• Obtaining of the final shutdown decree allowing the first dismantling operations</td>
</tr>
<tr>
<td>2007-2009</td>
<td>• Preparatory work for the dismantling</td>
</tr>
<tr>
<td>2009-2012</td>
<td>• Dismantling of the non-nuclear and nuclear parts of the facilities, excluding the reactor “cave”</td>
</tr>
<tr>
<td>2012-2016</td>
<td>• Dismantling of the reactor “cave”, excluding the reactor vessel</td>
</tr>
<tr>
<td>2012-2016</td>
<td>• Preparatory work for the dismantling of the reactor vessel</td>
</tr>
<tr>
<td>2017-2022</td>
<td>• Dismantling of the reactor vessel</td>
</tr>
<tr>
<td>2017-2022</td>
<td>• Soil cleaning actions</td>
</tr>
<tr>
<td>2022</td>
<td>• End of dismantling</td>
</tr>
</tbody>
</table>

Dismantling of the internal vessel components, December 2017
### RADIOACTIVE WASTE MANAGEMENT (1/2)

<table>
<thead>
<tr>
<th>TYPE OF WASTE</th>
<th>EXAMPLE</th>
<th>POSITION/STORAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY-LOW-LEVEL WASTE (VLLW)</td>
<td>They come from the decommissioning of nuclear installations (concrete, scrap, piping, etc.)</td>
<td>On the surface at the Morvilliers storage centre managed by ANDRA&lt;sup&gt;(1)&lt;/sup&gt;</td>
</tr>
<tr>
<td>SHORT-LIVED INTERMEDIATE- AND LOW-LEVEL WASTE (SL-ILW and LLW)</td>
<td>They come from maintenance works (tools, clothes, dismantled parts, etc.); waste from the processing of liquid and gaseous effluents of operating plants; other deconstruction waste</td>
<td>On the surface at the Soulaines storage centre, managed by ANDRA&lt;sup&gt;(1)&lt;/sup&gt;</td>
</tr>
<tr>
<td>LONG-LIVED, LOW-LEVEL WASTE (LL-LLW)</td>
<td>They essentially are graphite waste from the dismantling of first generation plants</td>
<td>At the production site waiting for a special subsurface storage (from 15 to 200m) to be built. Project under study</td>
</tr>
<tr>
<td>LONG-LIVED INTERMEDIATE-LEVEL WASTE (LL-ILW)</td>
<td>Metallic structures of the assemblies separated during the processing of spent fuel, other dismantling waste</td>
<td>At the production site then at the ICEDA storage facility (Installation d'Entreposage et de Conditionnement des Déchets Actifs), as early as its commissioning mid-2019, while awaiting for the deep geological waste storage Cigéo&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>HIGH-LEVEL WASTE (HLW)</td>
<td>Non-recyclable material from the processing of spent fuel</td>
<td>Temporarily stored in dedicated installations in La Hague site of ORANO, while awaiting for the deep geological waste storage Cigéo&lt;sup&gt;(2)&lt;/sup&gt;. Beginning of the pilot industrial phase in 2026</td>
</tr>
</tbody>
</table>

---

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

<sup>(2)</sup> For more information about Cigéo, please see p. 96
RADIOACTIVE WASTE MANAGEMENT (2/2)

UNITS IN DECOMMISSIONING

- Rubble, scrap metal, pipes
- Technological and filtration waste
- Operating, maintenance and decommissioning waste
- Graphite from 1st generation gas cooled reactors
- Metal components belonging to the reactor core
- Metallic structures from spent fuel assemblies
- Spent fuel fission products

UNITS IN OPERATION

- WASTE
- TREATMENT
- INCINERATION
- MELTING
- COMPACTION
- VITRIFICATION

PACKAGING

- Drums, big bags or bins
- Drums, metal, plastic or concrete boxes
- Concrete containers
- Concrete boxes
- Concrete containers
- Steel containers
- Steel containers

DISPOSAL

- Surface disposal
- Surface disposal
- Near surface disposal
- Storage facility
- Storage facility
- Deep geological disposal

EDF

MAIN BUSINESSES NUCLEAR
CIGÉO – A DEEP-STORAGE INDUSTRIAL CENTRE

French deep-storage project for Long-lived Intermediate-level and High-level radioactive waste, generated mainly by the existing French nuclear facilities (nuclear power industry, research, defense, etc.). Such waste represents 3% of the total volume of radioactive waste and is alone responsible for 99% of waste radioactivity.

- The French law of 28 June 2006 tasked the National Agency for Radioactive Waste Management (ANDRA) with designing, constructing and operating Cigéo.
- The authorisation request of the Cigéo creation will be submitted in 2019. It plan the site to be located in eastern France, on the border between the Meuse and Haute-Marne, near the ANDRA underground laboratory (Bure).

The principle of reversible storage in deep geological strata

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

Secure and robust facilities that are adaptable on two levels

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

Following the acquisition of the English and Swedish assets of Studsvik holding company, in 2016, a subsidiary “Cyclife” was created to centralise the Group’s activities on nuclear decommissioning and waste treatment for the French and international market.

The offerings of Cyclife cover the entire value chain of the decommissioning and waste treatment: preliminary studies, engineering, management, training, etc.

Cyclife owns complementary waste treatment facilities located in 3 countries:

- The low-activity waste processing and packaging centre by smelting or by incineration (Centraco), in France
- Facilities for waste processing by metal recycling, incineration and pyrolysis situated at the Nykoping site in Sweden
- The Workington Metal Recycling Facility (MRF) in Workington, the UK

<table>
<thead>
<tr>
<th>Country</th>
<th>Metal waste treatment (clean up, cutout): 2,500 t/year</th>
<th>~ 20 employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>Metal waste treatment (clean up, cutout): 2,500 t/year</td>
<td>~ 20 employees</td>
</tr>
<tr>
<td>Sweden</td>
<td>Smelting: 5,000 t/year Incineration: 600 t/year Pyrolysis: 50 t/year</td>
<td>~ 85 employees</td>
</tr>
<tr>
<td>France</td>
<td>Smelting: 3,500 t/year Incineration: 5,000 t/year</td>
<td>~ 230 employees</td>
</tr>
</tbody>
</table>

(1) After transaction – maximum authorised capacities
EDF GROUP MAIN BUSINESSES

- NUCLEAR P. 60
- RENEWABLES P. 98
- THERMAL POWER P. 124
- REGULATED ACTIVITIES (NETWORKS) P. 129
- OPTIMISATION & TRADING P. 141
- CUSTOMER SOLUTIONS P. 154
- ENERGY SERVICES P. 167
- GAS P. 177
EDF’s leadership in renewables activities is a strong platform for growth

International presence

- Hydro: 23.0 GW
- Wind: 7.9 GW
- Solar: 1.4 GW
- Other: 0.3 GW

Balanced capacity mix with 32.5 GW in operation

- Capacities in operation: 23 GW of hydropower and 9.5 GW of other renewable energies
- Leader in Europe with a growing development pipeline

Capacity by technology

- Hydro: 23.0 GW
- Wind: 7.9 GW
- Solar: 1.4 GW
- Other: 0.3 GW

(1) Net installed capacity, corresponding to consolidated data according to EDF’s percentage ownership in Group companies, including associates and joint ventures.
# RENEWABLE OUTPUT

Output from fully consolidated entities

<table>
<thead>
<tr>
<th>In TWh</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydro</strong>&lt;sup&gt;(1)(2)&lt;/sup&gt;</td>
<td>40.9</td>
<td>51.6</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>13.2</td>
<td>14.3</td>
</tr>
<tr>
<td><strong>Solar</strong></td>
<td>0.6</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Biomass</strong></td>
<td>1.4</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total electricity Group</strong></td>
<td>56.0</td>
<td>68.8</td>
</tr>
<tr>
<td><strong>Total heat Group</strong></td>
<td>6.8</td>
<td>8.9</td>
</tr>
</tbody>
</table>

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 after deductions of pumped volumes is 33.8TWh in 2017 and 44.3TWh in 2018

(2) Including marine energy: 0.6TWh in 2017 and 0.5TWh in 2018
FRENCH HYDROPOWER – A DIVERSIFIED & FLEXIBLE FLEET

Net Renewable installed capacity\(^{(1)}\) of the Group in France

- **22.4 GW**
  - Hydro & marine: 20.6GW
  - Other Renewables: 1.8GW

**433 plants** in France (mainland), average age of **74 years**

Covering the different kinds of hydropower facilities:
- Run-of-river / Pondage water / Reservoirs (lake-supplied) / Pumped storage / Tidal power

**Hydropower France** provides ~14GW of storage
- Reservoirs: 8.1GW
- Pumped storage: 5.04GW
  - Including the 1.8GW Grand’Maison facility, the largest European storage asset

**Only sizeable & cost competitive** electricity storage technology

**Estimated weekly flexibility needs\(^{(2)}\)**

- **+50 %**
  - Aujourd'hui
  - 2030

**Response time to reach full capacity of dispatchable units**

- **In ~10 minutes**
  - 0 GW
  - 14 GW

- **Allows quick adjustments to within-day fluctuations in the supply-demand balance**
  - Consumption peaks
  - Non forecasted loss of generation capacity

- **Hydropower is the most significant contributor to ancillary services**

---

\(^{(1)}\) Power generation capacity, in proportion of the share the EDF group held in each asset
\(^{(2)}\) Source: RTE (Bilan prévisionnel 2017)
DIFFERENT TYPES OF HYDROPOWER FACILITIES

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

- **Run-of-river**
  - No storage capacity
  - Energy generation depends solely on the current water condition

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

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

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

- **Tidal power**
  - The tidal power plant of the Rance river uses the tides and sea currents to power the turbines and thus generate electricity (renewable)
EDF’S HYDROPOWER FLEET IN MAINLAND FRANCE

Installed capacity ~20GW(1)

- Reservoirs ~8.1
- Pondage ~3.1
- Run-of-river ~3.6
- Tidal ~0.24
- STEP ~5.04

~22% of the overall EDF’s generation capacity in France

Average producible hydropower output(3): ~41.2TWh

- Reservoirs ~14.2
- Pondage ~8.2
- STEP ~1.5
- Run-of-river ~16.8
- Tidal ~0.5

~10% of the average EDF output in France

---

(1) Excluding Corsica and overseas departments, equivalent to 437MW.
(2) The tidal power plant of the Rance generates electricity by using the up and down movement of the tides.
(3) Gross average producible hydropower output: maximum quantity of energy that can be generated from the water sources (rain, snow) over one year, on average on the 1960-2015 period.
EDF POTENTIAL HYDROPOWER CAPACITY IN MAINLAND FRANCE\(^{(1)}\)

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

Potential hydropower capacity: maximum quality of power that can be produced from hydraulic sources (rain, snow) over a given period of time.
EDF HYDRO OUTPUT IN MAINLAND FRANCE

In TWh

- 2017 cumulative output (1)
- 2018 cumulative output (1)

Seasonal mins. and maxs. between 2002 and 2017

Normal hydro productibility levels

(1) Hydro output excluding island activities before deduction of pumped volumes
(2) Output after deduction of pumped volumes: 30.0 TWh for 2017 and 39.2 TWh for 2018
DEVELOP HYDROPOWER IN FRANCE AND ABROAD

Currently, 95% of France’s hydropower potential is being used. EDF is committed to developing its hydropower activities in order to increase their power and availability. EDF’s expertise is also recognised internationally.

≡ France

- **Romanche-Gavet (Isère):** increase in hydro output
  
  Launched in the Romanche valley, near Grenoble, the Romanche-Gavet site consists of replacing six old plants with a single 92MW underground plant that is more efficient and better integrated into its environment. The new plant will ultimately generate 560GWh/year, with 30% more generation than the current six plants. The new hydropower development at Romanche-Gavet will also be more respectful of the environment and will restore ecological continuity over more than 10 km. The end of the construction is scheduled for 2020.

- **La Coche (Savoie):** construction of the most powerful generation unit in France
  
  EDF is building the most powerful generation unit in France at La Coche: 240MW. This generation unit, which will be completed in 2019, will increase the capacity of the existing development by 20% and produce additional 100GWh each year.

≡ International

- **Sinop (Brazil):** construction of a 408MW dam (see p. 107)

- **Nachtigal (Cameroun):** construction of a 420MW dam (see p. 108)
SINOP HYDROELECTRIC DAM IN BRAZIL

Key features of the project
- 408MW hydropower facility in the State of Mato Grosso
- 2 X 200MW Kaplan turbines, which are among the most powerful and largest in the world for this technology
- Average output of 2,100GWh/yr and a reservoir area of 337 km²
- The project is led by Companhia Energética SINOP SA (CES), which is responsible for building, equipping and operating the dam. EDF acquired a 51% stake in the company in December 2014; the two other shareholders are Eletrobras subsidiaries: Eletronorte (24.5%) and Chesf (24.5%)
- Sale of the electricity generated under 34 30-year Power Purchase Agreements (PPA) with distribution companies.

Financing structure
- Total projected project cost: c. €880 million(1)
- ~26% financing by the Brazilian Development Bank (BNDES) and a €54 million infrastructure debenture bond issue in June 2018. The remainder is equity financed.

Schedule
- Q2 2018: EDF Norte Fluminense was awarded the SINOP O&M contract
- 24 January 2019: filling permission
- H2 2019: Operating license and commissioning expected

(1) As of 31 March 2019 exchange rates
NACHTIGAL HYDROELECTRIC DAM IN CAMEROON (1)

Key project features

- Design, construction and operation for a period of 35 years of a 420-MW run-of-the-river hydropower plant on the Sanaga river near the Nachtigal Falls
- Construction of a 50-km power transmission line
- Will be owned and operated by NHPC (Nachtigal Hydro Power Company), currently comprising EDF (40%) (2), IFC (3) (20%) and the Republic of Cameroon (15%), Africa50 (15%) and STOA (10%)
- Expected power generation to cover 30% of the country’s electricity demand (~3TWh p/y)
- Substantial economic benefits: up to 1,500 direct jobs during peak construction periods, of which 65% will be locally sourced within a 65-km radius of the construction site. The project will generate dozens of permanent jobs.

Financing structure

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

Schedule

- Final and binding agreements signed on 8 November 2018, financial closing on 24 December 2018
- Start of construction early 2019
- Commissioning expected in 2023

---

(1) Please refer to press release published by EDF on 8 November 2018
(2) Equity consolidation method
(3) IFC – a sister organization of the World Bank and member of the World Bank Group
(4) DFI include: AfDB, IFC, 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
THE RENEWAL OF HYDROPOWER CONCESSIONS

In 1993, under the “Sapin” Law to fight corruption, all public service delegations, including concessions, must go through a call for tenders procedure, unless there is a monopoly or if the public service is entrusted to a public institution. Given the preferential right provided for by the 1919 Law, its status as public institution and its monopoly on the electricity sector, EDF had its concessions renewed by mutual agreement until the beginning of the 2000s. Since 2004, with the conversion of EDF into a public limited company, hydropower concessions now falls within the scope of the Sapin law, but a right of preference is always recognised by law to the outgoing concessionaire.

- **2006/2008**: The preferential right granted to the outgoing concessionaire was eliminated by the Water and Aquatic Environments Act in 2006. The Borloo Decree, which organised the publicity and competitive tendering procedure applicable to the renewal of hydropower concessions, was adopted on 26 September 2008. The award procedures already underway before its entry into effect on 29 September 2008 were not called into question for concessions for which: (i) the administrative authority had acknowledged receipt of a concession application or a request for an amendment before 29 September 2008, or (ii) a renewal procedure had been initiated before 29 September 2008 for the benefit of concessionaires who were public institutions on the date on which they were invited to submit a concession application by the administrative authority.

- **17 August 2015**: adoption of the Energy Transition to Green Growth Law reflecting in particular the reflections made by the State on the competitive bidding process and including the following provisions:
  
  • Possible grouping of concession contracts forming a “series of facilities that are hydraulically linked”
  
  • Possible creation of semi-public hydroelectric companies (SEM) made up of a private-sector operator selected through a tender and a public Division (State, local authorities, etc.), each of which holds at least 34% of the shares
  
  • Possible extension of certain concession contracts in return for investments (works) by operators where these upgrades are necessary in order to reach national energy policy targets

- **22 October 2015**: Formal notice sent to the French State by the European Commission (EC) on the grounds that the concentration of concessions with EDF would harm competition on the retail electricity market

- **12 April 2017**: The State notified to the European Commission (General Division Growth - “GROW”) on 12 April 2017 a project for the extension of the concessions of the Truyère valleys in return for investments. This file is still under study.

- **7 March 2019**: Formal notice sent to the French State by the European Commission on the grounds that, in particular, (i) the absence of a competitive tendering procedure for the renewal of hydropower concession contracts is contrary to European law, and (ii) the non-compliance of the French law governing these renewals with the European law on public orders.
EDF RENEWABLES: NET INSTALLED CAPACITY AS OF 31 DECEMBER 2018

Key
Wind installed (MW)
Solar installed (MWp)
Wind and solar under construction (MW)

Other technologies

<table>
<thead>
<tr>
<th>Gross</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity</td>
<td>12,891MW</td>
</tr>
<tr>
<td>Capacity under construction</td>
<td>2,360MW</td>
</tr>
<tr>
<td>Total</td>
<td>15,251MW</td>
</tr>
</tbody>
</table>

Source: EDF Renouvelables
Note: MWp: Megawatt peak (measure of the power under laboratory lighting and temperature conditions)
EDF RENEWABLES: A LEADING RENEWABLES PLAYER WITH STRONG TRACK RECORD

EDF Group’s subsidiary for the development of new renewables

- Strengthened positioning in offshore wind
- Entry into Morocco, and South Africa
- Entry into Brazil and Chile
- First merchant solar PV project
- Entry into China
- Strong development in distributed solar PV (US: groSolar acquisition, France: “Mon Soleil & Moi” self-consumption offering launched)
- EDF Énergies Nouvelles rebranded EDF Renouvelables in France and EDF Renewables internationally(1)

2011
- EDF Group takes 100% of EDF EN
- Entry into Mexico and Israel

2012
- Strong development of Operation & Maintenance activities
- Entry into India

2013
- EDF Renewables commissioned its first PV + storage project (Toucan, French Guyana)

2014
- Acquisition of Futuren
- Collaboration with Masdar for the largest solar PV plant in the region of Middle-East & Northern Africa (DEWA 3 - 800MW)

2015

2016

2017

2018

EDF Renewables’ scope includes all non-hydro renewables activities of the Group, except some assets in Italy (Edison), Belgium (EDF Luminus) and in the UK (50% held by EDF Energy)

(1) For more information please refer to EDF Renewables’s press releases of 12 April 2018 and 6 September 2018
EDF RENEWABLES: A SUSTAINABLE BUSINESS MODEL, LEVERAGING KEY COMPETITIVE ADVANTAGES

KEY COMPETITIVE ADVANTAGES...

- Extensive and diversified international footprint
- EDF brand name with dynamic and flexible structure leveraging on local Group synergies
- Integrated O&M skills and capabilities: operational excellence

... SUPPORTING A MODEL GEARED TOWARDS SUSTAINABLE GROWTH

- Partnerships bringing strong development opportunities and local market knowledge, with reduced balance sheet impact
- An intensified development phase starting 2017, with gradually growing CAPEX and a robust projects pipeline
- A generator aiming to gradually grow installed capacity and output
- A strong ability to maximise value from selective asset rotation to cover corporate and development costs

An integrated player, active across the entire value chain, with the ability to develop highly competitive projects with high returns
EDF RENEWABLES: A DEDICATED SUBSIDIARY TO BENEFIT FROM RENEWABLES CAPACITY GROWTH

**Net installed capacity x3 since 2010**

- 2010: 2.7GW
- 2018: 8.3GW

**Significant increase in total output**

- 2010: 6.1TWh
- 2018: 15.2TWh

**INTEGRATED OPERATOR ALONG THE VALUE CHAIN**
- Development, Construction and Operation
- Operation & maintenance (15GW under management)
- DSSA(1)

**LEADING POSITION IN WIND**
- 13.3GW developed and built over the last 15 years
- 2nd company in wind power in France

**ACCELERATION IN THE SOLAR**
- 54% of 2018 commissioned projects

(1) Development and sale of structured assets
EDF RENEWABLES : DEVELOPMENT OF HIGH VALUE CREATION PROJECTS

A SELECTIVE DEVELOPMENT POLICY…  … TO DELIVER ATTRACTIVE IRR SPREADS\(^{(1)}(2)\) ABOVE WACC

- Rigorous country analysis
- Stringent initial project selection
- Advanced engineering capabilities to estimate projects’ returns
- Unique procurement process with in-depth due diligence of supply chain
- Strict investment decision processes

\(1\) Average performance based on a review of all projects over €50m CAPEX until mid-2016
\(2\) Scope EDF Renewables. Based on estimations at 31 December 2016 of revenues from fully consolidated assets. Includes regulated, quasi-regulated and long-term contracted assets

~150 to 200 bps

Onshore wind

Solar PV
WITH OVER 3.8GW SOLD SINCE 2013, DSSA(1) IS AT THE CORE OF EDF RENEWABLES’S BUSINESS MODEL

EDF Renewables has an excellent DSSA track record

CONSISTENT ROTATION OF OPERATIONAL ASSETS (EDF RENEWABLES NET CAPACITY SOLD)

- 2013: 0.5 GW
- 2014: 0.7 GW
- 2015: 0.6 GW
- 2016: 1 GW
- 2017: 0.3 GW
- 2018: 0.8 GW

DSSA: a self-funding and value accretive business model

- DSSA consists of the disposal of certain fully-structured projects (typically in operation and financed)
- Allows the execution of additional market opportunities with superior returns

CUMULATIVE ASSET ROTATION 2013 TO DATE

- Rest of the world: 5%
- Europe: 23%
- North America: 72%

3.8 GW

DSSA ACTIVITIES ARE AN IMPORTANT PART OF EDF EN’S BUSINESS MODEL

KEY BENEFITS OF DSSA

- Immediate value crystallisation: Realise premium on capex
- Balance portfolio through asset rotation
- Increase financial flexibility through management of investments
- Increased competitiveness due to lower financing costs due to participation of a co-investor

(1) Development and sale of structured assets (DSSA)
WITH 15GW UNDER MANAGEMENT, O&M EXPERTISE CREATES VALUE FOR THE WHOLE CHAIN

4 key principles

- **Competition with turbine manufacturers, particularly on contract renewals**

- **M&A and DSSA(1): improved evaluation of acquisitions and an advantage for asset divestitures**

- **Better price positioning on tenders / auctions and increase of the IRR by operational services**

- **Strong credibility** regarding the turbine manufacturers and third party investors

- **Rationalising of projects** by optimising conception and construction

- **Tender preparation**

- **Transparency and a shared goal of improvement** of the production

- **Continuous innovation and predictive maintenance programs**

---

(1) Development and sale of structured assets (DSSA)
EDF RENEWABLES: A SUBSIDIARY FOCUSED ON LARGE-SCALE STORAGE SOLUTIONS

EDF Renewables is responsible, together with other EDF entities, for the commercial and technical success of the Electricity Storage Plan, in particular:

- **LARGE SCALE STORAGE**
  - Economic and commercial responsibility - on storage projects in France and the USA
  - Economic and commercial responsibility - on all hybrid projects (including micro-networks)
  - Technical responsibility for all projects

- **DISTRIBUTED STORAGE IN MASS MARKETS**
  - Economic and commercial responsibility in the United States and Germany
  - Technical responsibility together with EDF ENR

Emerging markets with various value creation opportunities (system services, peak reduction, arbitration, etc.)

First interesting projects:
- Frequency regulation:
  - McHenry (US)
  - West Burton B (UK)
- Stockage C&I: NewBorn (Germany)

The projects concretise the complementarity of the storage associated with renewable energies:
- Batteries and hydropower (Pézilla project in France, system services)
- CSP(1) and PV (Noor Middelt project in Morocco)
- Batteries and PV (US, Israel)

Complementary projects will feed the pipeline for years to come.

West Burton B Project
49MW - United Kingdom

(1) Concentrated Solar power
EDF RENEWABLES: A SIGNIFICANT PORTFOLIO OF RENEWABLE PROJECTS UNDER DEVELOPMENT

A wind and solar pipeline of around 26.5GW

Capacity by technology

Wind 17GW

Solar 9.5GW

26.5GW

Source: EDF Renewable
NB: the pipelines are indicated for EDF Renewable and include capacities in construction
EDF’S SOLAR POWER PLAN: BECOME THE LEADER OF SOLAR IN FRANCE BY 2035

Challenges

- In addition to small and medium-sized power plants on the ground and on roofs, necessity to deploy large solar power plants on the ground (savings on construction costs, optimised operation & maintenance costs, implementation of more efficient and innovative technical solutions)
- Between 25,000 and 30,000 hectares of land must be identified
- Tender process on larger solar power plants using large bank loans, partnerships and power purchase agreements

Resources deployed by the EDF group

- Mobilisation of the Group supply chain as well as industrial and financial partners
- Use of internal resources and acceleration of development effort
- Identification of suitable land from EDF portfolio of land assets
- Cooperation with public authorities to access large sites

- Target of 30% market share in solar energy in France between 2020 and 2035
- ~€25bn of investment needs
- EDF equity investment optimised via the financing structure and the search for partnerships
- 1st estimate of the equity commitment of EDF: ~ €200m/year, from 2020

- A significant pipeline of projects c. 900 MWp gross capacity under development, 100% solar in France

- A fully integrated player:
  - Development
  - Construction
  - Operation and Maintenance

- A renowned team specialized in development and operation of solar projects in France

~1 GWc gross capacity in operation or under development in France
Successful value creation through a strategic partnership in the 3 first French offshore wind projects

Eolien Maritime France portfolio
- 3 offshore wind projects in France
- Over 1.4GW of combined capacity

Highly valuable partnership with Enbridge

Total investment costs of c. €6bn
- Efficiency increases with economies of scale

Optimised financial structure
- Partnering up to share funding, development and construction risks
- Equity method

Innovation in floating offshore

Innovative pilot awarded in France in November 2016
- Floating foundations allow for higher load factors as they can be placed in particularly windy areas previously untapped
- Contract awarded to EDF Renewables for the installation of three 8-MW turbines on floating foundations in the Faraman area (off Fos-sur-Mer)
## OFFSHORE WIND POWER: THE BLYTH PROJECT IN THE UNITED KINGDOM

<table>
<thead>
<tr>
<th><strong>Capacity</strong></th>
<th>41.5MW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turbine type</strong></td>
<td>5 x 8.3MW MHI Vestas</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>~6 km from the coast</td>
</tr>
<tr>
<td><strong>Depth of water</strong></td>
<td>~38 m</td>
</tr>
<tr>
<td><strong>Ground conditions</strong></td>
<td>Sand, silt and clay</td>
</tr>
<tr>
<td><strong>Interconnection lines</strong></td>
<td>~11 km at sea and 1.5 km on land</td>
</tr>
<tr>
<td><strong>Foundation weight</strong></td>
<td>15,000 tons</td>
</tr>
<tr>
<td><strong>Electricity generation</strong></td>
<td>Supply of electricity to 34,000 British homes</td>
</tr>
</tbody>
</table>

### Key dates
- **FID:** January 2016
- **Start of construction:** June 2016
- **Turbine installation:** September 2017
- **Start of electricity generation:** October 2017
### Key Project Facts
- Project Capacity 448MW
- Expected output ca. 1,850GWh
- Fully Consented Project in Pre-Construction Phase
- Located in the Outer Firth of Forth (Scottish Territorial Waters)
- Ca. 37km of Offshore Export Cable and 12km onshore export cable
- Water depths of between 45 – 55m
- Contract for Difference (“CID”) 15yy from COD at £127 (2018, fully CPI Indexed)

### Key Dates
- May 2018: Acquisition by EDF-ER
- December 2018: New Consent Awarded
- Target Financial Close: Summer 2019
- Start of on-shore works: Q3 2019
- Start of offshore works: 2020
- Target Commissioning Window (CID): March 2022 – March 2023

---

### Key Project Facts
- Project Capacity 1.7 to 2.4GW
- Size of the project: 742km²
- Joint Venture project with Shell, pari passu 50/50
- Water depths of 20 meters, 10 miles from shore
- Wind Turbine Generator Unit Capacity 12-15MW
- Two separate areas for the project
  - **New Jersey Leases**
    - Established NJ Wind Energy Area ~57km by 20km
    - North lease acquired in December 2018
    - Lease area ~20km from shore and 20m depth
  - **New York Leases**
    - BOEM\(^1\) proposing up to five new Bight Sites (Areas NY 1-5)
    - 85-100km from shore and 40-50m depth

### Key Dates
- Atlantic Shores Offshore Wind submitted bid into the New Jersey RFP on 28 December 2018
- The New York RFP bid will be submitted on February 14, 2019
- Project construction is expected in 2026+ horizon

---

\(^1\) Bureau Of Ocean Energy Management (BOEM), manages the competitive leasing policy and program for energy development
ADJUSTMENT OF THERMAL POWER TO EDF’S LOW CARBON STRATEGY

Modernisation of the EDF’s fleet in mainland France to improve its technical and environmental performance

- Final shutdown of fuel oil production units: two units in Aramon on 1 April 2016, four in Porcheville and one in Cordemais in spring 2017. The last fuel oil plant in EDF’s French fleet (Cordemais 3) was shut down on 31 March 2018

- Commissioning of four combined-cycle gas turbines (CCGT) between 2011 and 2016 to replace the coal-fired power plants that were shut down. CCGTs emit half as much CO₂ per kWh generated, three times less nitrogen dioxide, very little sulphur and virtually no dust

- In January 2019, EDF and the Ministry of Ecological and Solidarity Transition validated a work program prior to a decision on the Ecocombust project. The purpose of this work program is to qualify, by the fall of 2019, the technical tests, the environmental impact studies and the economic model of the project. At that date, subject to satisfactory conclusions, EDF will begin the industrialisation phase for the manufacture of fuel starting in 2022.

- Thermal represents ~ 18% of the EDF group’s installed capacity(1). The share of thermal in the energy mix of the Group varies from one country to another: in 2018, it reached ~ 2% of electricity generation in France(2) and ~ 79%(3) in Italy.

Did you know?

The EDF group’s thermal fleet as of end-2018(1):

~ 22GW
installed in the world

~ 10GW
of coal-fired and fuel oil power plants

~ 12GW
Of gas plants
(including cogeneration)

---

(1) Consolidated capacity of the EDF’s group as of end-2018
(2) Excluding Corsica and overseas departments (1.7TWh in 2018)
(3) Of which 14,724GWh in generation and 859GWh in Energy Efficiency services to customers
EDF THERMAL PLANT FLEET IN MAINLAND FRANCE

~ 5.4GW⁽¹⁾ (excluding overseas departments and Corsica) divided as follows:

- **Coal-fired plants**
  - Three 580MW units

- **Combined-Cycle Gas turbines (CCGT)**
  - Four CCGTs totalling 1,932MW

- **Combustion turbines (TAC)**
  - Thirteen TACs totalling 1,843MW

⁽¹⁾ As of 01/04/2019
AN INDUSTRIAL PROJECT FOR A BETTER ENVIRONMENTAL PERFORMANCE

Atmospheric emissions from the EDF SA thermal fleet in mainland France

CO₂ emissions from the EDF SA thermal fleet in mainland France

Air pollutant emissions from EDF SA’s thermal power generation fleet in continental France

In 2018, thanks to the modernisation of the thermal fleet

- Specific emissions\(^{(1)}\) of CO₂ of the EDF fleet in mainland France have been reduced by 45% since 2000

- All specific emissions of SO₂, NOₓ and dust from EDF's thermal fleet in mainland France have been reduced by 90% since 2005.

The ECOCOMBUST project

Under experimentation at the Cordemais power plant, this project consists in the manufacturing of an innovative and ecological fuel based on recovered wood, allowing for the operation of heating installations or electricity generation. The manufacture of the fuel, carried out locally, would make it possible to launch a new sector for the valorisation of materials which are not used today and which are most often buried or put in landfills.

\(\text{(1) Specific emissions: pollutants’ quantity brought to a standard value: g/kWh for this case}\)
EDF enhances its expertise and know-how in thermal power and transportation by developing the sale of services to third parties. Its offer extends over the entire value chain of electricity generation facilities, from feasibility studies to decommissioning and including construction and operation. Among the main operations in 2018:

- **Qatar Project**: assistance for the construction of substations and lines
- **Saudi Arabia**: technical support and maintenance at the e-monitoring system at the Saudi Electricity Company
- **Senegal**: technical assistant for the implementation and supervision of operation and maintenance of the Sendou plant
- **Morocco**: technical assistance and training for TAQA in safety
- **Greater Mekong**: interconnection studies between the 6 Mekong countries
- **Ivory Coast**: supervision of transmission facilities: substations and high-voltage lines
- **Egypt**: design of the control room for the Talkha regional power grid
EDF GROUP MAIN BUSINESSES

- NUCLEAR P. 60
- RENEWABLES P. 98
- THERMAL POWER P. 124
- REGULATED ACTIVITIES (NETWORKS) P. 129
- OPTIMISATION & TRADING P. 141
- CUSTOMER SOLUTIONS P. 154
- ENERGY SERVICES P. 167
- GAS P. 177
**ENEDIS(1): HIGH VISIBILITY ON GROWTH AND RETURNS FROM REGULATED ACTIVITIES**

**LEADING DISTRIBUTION PLAYER IN EUROPE**

- ~36m delivery points
- 375 TWh electricity distributed
- Enedis(1) #1 electricity distribution network in Europe
- ~1.4m kms of lines
- ~38,691 employees

**2018 KEY FIGURES(2)**

<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>2017</th>
<th>2018</th>
<th>Δ%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>14,023</td>
<td>14,203</td>
<td>+1.3</td>
</tr>
<tr>
<td>EBITDA</td>
<td>3,993</td>
<td>4,028</td>
<td>+0.9</td>
</tr>
<tr>
<td>Net income excl. non-recurring items</td>
<td>791</td>
<td>852</td>
<td>+7.7</td>
</tr>
<tr>
<td>Gross operating investments(3)</td>
<td>3,767</td>
<td>3,998</td>
<td>+6.1</td>
</tr>
</tbody>
</table>

---

(1) Enedis is an independent subsidiary of EDF under the provisions of the French energy code  
(2) Local data  
(3) Including Linky, project led by Enedis
ENEDIS(1): QUALITY OF DISTRIBUTION IN FRANCE

- Criteria B(2) excluding exceptional events and excluding RTE: 64 minutes in 2018
- Criteria B(2) including all causes (TCC): 81 minutes(3) in 2018

---

(1) Enedis, an independent EDF subsidiary as defined in the French energy code
(2) Cumulated average duration in minutes of outages per low customers voltage
(3) Four exceptional climatic events: Eleanor storm and the Seine flood in January, the storms of July 4th in the South West, and the episode of sticky snow from the night of October 29 to 30 in the Rhone Valley and in Auvergne
TARIFF FOR USING THE PUBLIC ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS (TURPE) GENERAL PRINCIPLES

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

- ... complemented by criteria to best meet the expectations of stakeholders
  - Efficiency: the tariff signal leads users to modify their behaviour and encourages the reduction of costs over the long term
  - Readability: level of complexity appropriate to the type of user and the voltage level considered
  - Consistency: the different options offered to the same user must reflect the costs with the same degree of detail
  - Feasibility: tariffs must be able to be implemented
  - Progressivity: a change in tariffs must generate progressive effects
TARIFF FOR USING THE PUBLIC ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS (TURPE) FINANCIAL ASPECTS

From a financial perspective, the TURPE must comply with Article L341-2 of the French Energy Code, which stipulates that “the tariffs for using the public transmission network and the public distribution networks are calculated in a transparent and non-discriminatory manner, in order to cover all the costs borne by the operators of these networks to the extent that these costs correspond to those of an efficient network operator”

TURPE 5 is structured in this line around the hedging of operating expenses and capital charges, and in a differentiated manner for transport and distribution, with two separate resolutions from the regulator

<table>
<thead>
<tr>
<th>Duration</th>
<th>around 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff change</td>
<td>at 1 August, based on inflation + tariff catch-up</td>
</tr>
<tr>
<td>CRCP(^{(1)})</td>
<td>coverage of the difference between the realised and the projected trajectory</td>
</tr>
<tr>
<td>Incentive regulation</td>
<td>quality of supply, requirement level in terms of quality of services, performance on controllable OPEX</td>
</tr>
<tr>
<td>Operating costs:</td>
<td>for the covered portion to the nearest euro (system operating costs), for the required portion (business operating costs)</td>
</tr>
<tr>
<td>Capital charges</td>
<td>includes the differentiated remuneration between transport (remuneration of the RAB(^{(2)}) to a WACC(^{(3)})) and distribution (margin on assets included in the RAB of regulated equity), as well as the hedging of long-term investment trajectories</td>
</tr>
</tbody>
</table>

TURPE includes provisions for incentive regulation (bonus/malus for technical objectives, in addition to required OPEX), but also secures financial trajectories through the “CRCP\(^{(1)}\)” mechanism

---

\(^{(1)}\) CRCP: “Compte de Régularisation des Charges et des Produits”, Income and expenses adjustment account This is a non-accounting tool that can be used to cover any ex post facto discrepancies, on clearly identified expense and revenue items, between the realisations and the forecasts taken into account for the preparation of the tariff

\(^{(2)}\) RAB: Regulated Asset Basis

\(^{(3)}\) WACC: Weighted average cost of capital
PUBLIC ELECTRICITY NETWORK ACCESS TARIFF (TURPE): KEY DATES OF TURPE 5 “BIS”

- Decision by the CRE\(^{(2)}\) on 28 June 2018\(^{(3)}\) regarding the decision on the TURPE 5 bis HTA/BT distribution rates, which come into effect from **1 August 2018** for a period of approximately three years (not retroactive):
  - Increase in regulated equity of Enedis\(^{(4)}\) pursuant to the decision by the Council of State of 9 March 2018 totalling circa €1.6 billion (representing an increase in authorised income of €64 million for 2018, falling in subsequent years). Over time, this will provide Enedis\(^{(4)}\) with additional income equal to, on a net present value of cash flows before tax basis, €\(_{2018}^{750}\)m according to the estimate by the French Energy Regulator.
  - Update of the corporate tax rate, resulting in an adjustment of the return rate to 4% for regulated equity and 2.5% for the margin on assets (versus 4.1% and 2.6% previously)
  - No reconsideration of the other aspects of TURPE 5 HTA/BT: trajectory of operating expenses, net investments, incentive regulatory framework of TURPE 5 HTA/BT and of Linky maintained
  - Average change as of 1 August 2018 of -0.21%, including +1% for inflation, -1.27% to clear the balance of the so-called CRCP, a balancing mechanism and +0.06% for regulated equity revaluation and corporate tax rate update

---

(1) CRE: Commission de Régulation de l’Énergie (French Energy Regulator)
(2) Published in the Official Journal of 28 July 2018
(3) Enedis, an independent EDF subsidiary as defined in the French Energy Code
## REGULATED ASSET BASE IN FRANCE

<table>
<thead>
<tr>
<th>Transmission</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulated Asset Base as of 01/01/2019</strong></td>
<td></td>
</tr>
<tr>
<td>NBV of fixed assets(^{(2)})</td>
<td>NBV of fixed assets(^{(2)})</td>
</tr>
<tr>
<td>(= €14.3)bn</td>
<td>(= €51)bn</td>
</tr>
<tr>
<td>Regulated equity(^{(3)})</td>
<td>Regulated equity(^{(3)})</td>
</tr>
<tr>
<td>(= €7.6)bn</td>
<td></td>
</tr>
<tr>
<td>NBV of Linky</td>
<td>NBV of Linky</td>
</tr>
<tr>
<td>(= €1.7)bn</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal remuneration rate before corporate tax</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.125%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indexation CPI + K(^{(1)})</strong></td>
<td>(+6.76)% as 01/08/2017 (+3.0)% as 01/08/2018</td>
</tr>
</tbody>
</table>

- **Change in tariff**
  - \(-0.21\)\% as 01/08/2018 \(\approx +2.9\)\% as 01/08/2019\(^{(6)}\)

---
(1) CPI: Consumer price index covering all of France excluding tobacco of year \(Y-1\) - K: CRCP reconciliation term, within a range of +/-2\% (CRCP: The CRCP mechanism (Compte de Régularisation des Charges et des Produits) corrects for the differences between forecast and actual expenses and products, from one year to another)
(2) Excluding financial assets and assets under construction and after regulatory restatement of investment subsidies
Under TURPE 3, tariffs included only industrial D&A’s. Under Turpe 4, provision for renewal as well as all D&A’s are included
(3) Difference between the net book value of the fixed assets and the sum of the specific accounts of concessions, the provisions for renewal, the investment subsidies and, where appropriate, the financial loans; the regulated equity amount indicated takes into account the TURPE 5 bis decision and includes 1.6 billion in regulated equity as such
(4) Rates revised by the CRE in TURPE 5 bis vs. TURPE 5 to take into account the reduction of corporate tax rates provided for in the 2018 French Finance Act
(5) Premiums/penalties during the deployment phase
(6) Estimated revaluation based on the accounting elements and the incentive regulation known at 18/01/2018
TURPE 5 TRANSMISSION (TRANSPORT): AVERAGE FIGURES FOR 2017-2020

Capital charges adopted by CRE

- Compensation of assets in progress at 4.6%: 57 million Euros
- RAB remunerated at 6.125%: 891 million Euros
- Coverage of the RTE\(^{(1)}\) amortisation trajectory: 861 million Euros

Business Opex: CRE incentive based on RTE\(^{(1)}\) proposal: 1,889 million Euros

System Opex: cost coverage

- Interconnections and CRCP: (397) million Euros

Total authorised revenue adopted by CRE: 4,298 million Euros

Source: French Energy Regulation Commission (CRE)

\(^{(1)}\) RTE is an independent subsidiary of EDF under the provisions of the French energy code.
### TURPE 5 DISTRIBUTION: 2018 FIGURES (1)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (in millions of Euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital charges adopted by CRE</td>
<td>4,321</td>
</tr>
<tr>
<td>Equity charges Linky</td>
<td>250</td>
</tr>
<tr>
<td>Equity charges except Linky</td>
<td>4,071</td>
</tr>
<tr>
<td>Business Opex: mostly with incentive by the CRE</td>
<td>4,694</td>
</tr>
<tr>
<td>System Opex: cost coverage</td>
<td>4,663</td>
</tr>
<tr>
<td>Linky CRL and CRCP clearance</td>
<td>(296)</td>
</tr>
<tr>
<td>Total authorised revenue adopted by CRE</td>
<td>13,382</td>
</tr>
</tbody>
</table>

Source: French Energy Regulation Commission (CRE)

(1) Best vision corresponding to the CRE’s decision on TURPE 5 of 17/11/2016 for 2018 year, while awaiting for a new CRE’s decision for the period post 1st August 2018 which will precise the new values following the 09/03/2018 decision on partial cancellation of TURPE 5 by the French State Council.
LINKY(1): PREDICTABLE REGULATED RETURNS AND POSITIVE CASH FLOWS FROM 2022

15.6m customers equipped with the Linky meter at end-2018

~ 34m clients equipped by end-2021

~ €4bn(4) investments over 2014-2021

A specific 20-year tariff (regulation model with dedicated RAB)

2014 – 2021 investment pattern

<table>
<thead>
<tr>
<th>Year</th>
<th>In €bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>0.1</td>
</tr>
<tr>
<td>2015</td>
<td>0.1</td>
</tr>
<tr>
<td>2016</td>
<td>0.3</td>
</tr>
<tr>
<td>2017</td>
<td>0.6</td>
</tr>
<tr>
<td>2018</td>
<td>0.8</td>
</tr>
<tr>
<td>2019</td>
<td>0.9</td>
</tr>
<tr>
<td>2020</td>
<td>0.7</td>
</tr>
<tr>
<td>2021</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Linky – Return

7.25% pre-tax nominal return rate

+ 3% additional premium(3)

Key points as of 31/12/2018

- Compliance with the objectives of the regulatory incentives in terms of costs, deadlines and system performance
- A drop in installations between June and August, with a tendency to recover in the last quarter, in a climate of persistent opposition
- 354,000 terminals are equipped with a concentrator
- Publication at the end of September by ADEME of a new opinion highlighting the important contribution of smart meters.
- Development of commercial offers by suppliers using the Linky meter

(1) Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code
(2) Estimated Data
(3) +3% / -2% incentive premium / penalties depending on cost control, fulfillment of deadlines and system performance, during the deployment phase
(4) Costs at the end of the program have been revised downwards after taking into account the prices of the last equipment markets (concentrating meters) and delivery services signed.
## ELECTRICITY SMART METERING REGULATORY FRAMEWORK IN FRANCE, GREAT BRITAIN AND ITALY

<table>
<thead>
<tr>
<th>Deployment responsible entity</th>
<th>France(1)</th>
<th>Great Britain</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributors</td>
<td>Energy Suppliers</td>
<td>Distributors</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulatory entity</th>
<th>France(1)</th>
<th>Great Britain</th>
<th>Italy</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Targets</th>
<th>France(1)</th>
<th>Great Britain</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 million meters (deployment rate of 90%) to be installed by 2021. Incentive-based regulation focusing on 3 parameters (installation schedule, costs management and service quality) with bonuses and penalties</td>
<td>Take “all reasonable steps” to achieve 100% of residential and small business customers by end of 2020. Material fines for non-compliance with milestones and targets. 53 million meters(2) to be installed, and ‘In-Home-Displays’ must be offered to customers</td>
<td>Already reached: Italy has been a pioneer and deployment rate of smart meters exceeds 95% by the end of 2011</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project status</th>
<th>France(1)</th>
<th>Great Britain</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of the large-scale deployment in December 2015. Over 16 million customers equipped with Linky meter at end-2018</td>
<td>More than 13 million first generation smart meters were installed at the end of 2018. Suppliers also began installing second-generation smart meters. All industry parties are aware the 2020 end date has to be extended, discussions on what the timeframe and new regulatory framework for the new period will be have begun with BEIS</td>
<td>In April 2017, the Authority approved Enel’s plan to roll out, from 2017 to 2031, the 2nd generation smart meters, replacing all the 1st generation and having additional functionalities, to provide innovative services. The roll out is on going.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remuneration</th>
<th>France(1)</th>
<th>Great Britain</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff model, based on OPEX coverage and on a specific RAB remuneration, applicable for the whole life of assets, until 2040</td>
<td>BEIS have not updated the Impact Assessment (IA) since the original was written, as such the text is correct, but it should be added that an updated IA will be published in July 2019</td>
<td>Investment and installation costs of meters for distributors are remunerated on the basis of the tariff set by the Authority</td>
<td></td>
</tr>
</tbody>
</table>

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(1) For more information on France, please see p.138
(2) Electricity and gas meters


**ÉLECTRICITÉ DE STRASBOURG**

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

**Electricity distribution** (Strasbourg Électricité Réseaux)
- 14,000 kilometres of lines (including 700 kilometres in HVB) in more than 400 Alsatian municipalities having conceded their distribution network
- 540,000 delivery points, 7TWh distributed

**Supply of energies** (ÉS Énergies Strasbourg)
- 542,000 customers for electricity (6TWh) and 112,000 for gas (4.5TWh): residential, businesses and local authorities
- associated services (corrective maintenance, digital services), as well as support services for residential customers in home renovation and construction

**Energy services** (ÉS Services Énergétiques)
- Realisation and operation of energy services installations for local governments, homes, healthcare, the tertiary sector and industry
- operation of the three large-scale Eurométropole heat networks and 2,500 thermal installations

**Renewable energy generation**
- **Deep geothermal energy**: 2 installations in service (Rittershoffen 170GWh of heat, Soultz-sous-Forêts 7.7MWh of electricity) and a cogeneration project in progress
- **Biomass**: a cogeneration plant (70GW of electricity and 112GW of heat)

~€721 million in sales
~€53 million in net income
EDF GROUP MAIN BUSINESSES

- NUCLEAR P. 60
- RENEWABLES P. 98
- THERMAL POWER P. 124
- REGULATED ACTIVITIES (NETWORKS) P. 129
- OPTIMISATION & TRADING P. 141
- CUSTOMER SOLUTIONS P. 154
- ENERGY SERVICES P. 167
- GAS P. 177
The main role of the optimiser is to:

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

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

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

The optimizer programs the use of physical assets, secures financial results, operates on the wholesale market (through EDF Trading)

The supply-demand balance is forecasted over different time horizons
EDF TRADING, ACCESS PLATFORM TO WHOLESALE ENERGY MARKETS

- EDF Trading operates on all wholesale markets, in Europe and worldwide
- EDF Trading offers a full range of services and products on the wholesale markets: primary energy supply, management of generation assets, transport, regasification and storage capacities, forward purchases/sales
- As an exclusive market operator, EDF Trading maximises the value of the assets of EDF group entities and implements their financial hedging strategy
- EDF Trading extends its services to all EDF group customers, large companies and industrial customers, as well as to many producers and suppliers of energy

Well positioned with a broad geographical presence

- One of the largest suppliers of gas and electricity in North America
- A leading player in the European gas and electricity markets
- Growing development of international trade in the Pacific Basin

EDF Trading EBITDA

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITDA (in €m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>358</td>
</tr>
<tr>
<td>2018</td>
<td>633</td>
</tr>
</tbody>
</table>

Did you know?

In 2018, EDF Trading:
- holds a 33% financial stake in JERA Trading, one of the largest coal traders globally.
- signed a binding agreement with JERA to form an LNG optimization and trading joint venture.
- executed the first I-REC (International Renewable Energy Certificate) for the EDF Group.
For each moment, the optimiser schedules the operation of available means of generation, mobilising them according to the merit order of variable costs until the estimated demand is met.

Before using the market, each producer determines the resources required to meet a given level of demand. It classifies them from the least expensive to the most expensive.

It then determines the marginal cost, the variable cost of the most expensive means of generation called to meet the supply/demand balance of its own portfolio.

Given this marginal cost, it determines the sales and purchases volumes.

Spot power price (day ahead) is based on the marginal cost that forms the intersection of the supply of all producers with the overall demand to meet.

Variable costs: operating costs proportional to the generated energy, fuel costs, CO₂ costs of injection into the grid.
COST OPTIMISATION – SCHEDULING OF GENERATION FACILITIES BASED ON VARIABLE COSTS

Example of one high consumption day in winter in France

Every day, the optimiser sets up for the next day the functioning tool of the generation facilities, reflecting their dynamic constraints.

Did you know?

The merit order is a way of ranking available sources of energy, especially electrical generation, in ascending order of their short-run marginal costs of generation, so that those with the lowest marginal costs are the first ones to be brought online to meet demand, and the plants with the highest marginal costs are the last to be brought on line.
The optimiser, via EDF Trading, accesses the wholesale markets, which can take different forms:

- OTC (over the counter) bilateral agreements: direct trade with counterparty
- Regulated/market exchanges: pooling of supply and demand by a market organiser and settlement of trades (Epexspot in France, Belpex in Belgium, etc.)

The wholesale market is possible over different time periods, and allows the optimiser to secure income against unforeseen circumstances:

- Medium-term: purchases or sales of annual products for the years Y+1/Y+2/Y+3
- Short-term: same principle with purchases/sales today for the next day (spot) or over the next few hours of the day
- Intermediate products (monthly and quarterly products over two to three coming quarters and months, and weekly products over two to three coming weeks) also exist.
ARENH: CURRENT MECHANISM

- The regulated access to historic nuclear power (ARENH) mechanism entered into effect in 2011 to allow alternative suppliers who so request, for the supply to end customers, to benefit from a supply “under economic conditions equivalent to those for EDF resulting from the use of its nuclear power plants” through an annual product, which may be requested twice a year (in November and May), within the limit of an annual ceiling of 100TWh (excluding network losses). This mechanism is open to network operators to cover their losses, The Energy Regulation Commission (CRE) is responsible for managing the mechanism and calculating the fees of which it informs the alternative suppliers individually, and EDF in an aggregated manner.

- The ARENH price has been fixed at €42/MWh since 1 January 2012\(^{(1)}\). Since 2017, the delivered product includes 1MW of capacity guarantees per megawatt of subscribed ARENH.

- A project for the evolution of ARENH requests has been studied to take into account the recommendations of the French National Audit Court. The planned change consisted of spreading out ARENH requests over the year preceding the delivery of the quantities of energy so that the quantities requested correspond to the supply needs of the constituted customer portfolio. This reinforcement of the link between ARENH subscriptions and the contractualisation with the end customers aimed at preventing the risk of having the mechanism used for purposes other than that of making French consumers benefit from the competitiveness of the existing nuclear fleet.

- A draft decree was submitted in 2018 to the Higher Energy Council, the Energy Regulation Commission and the Competition Authority, which issued favourable opinions on the envisaged developments regarding the staggering of the requests and the removal of the mid-year window. However, the government indicated in April 2019 that there will be no change to the ARENH mechanism in 2019.

- Structural reform, however, remains necessary to ensure a balanced regulatory framework for the current nuclear facilities, particularly with regard to the compensation of the generation affected by ARENH and its asymmetrical nature. In the French Strategy for Energy and Climate presented at the end of November 2018, the government indicated that it would propose, in view of supporting the energy transition in France, “modalities for a new regulation of the current nuclear fleet, making it possible to guarantee the protection of consumers against market price increases beyond 2025 by allowing them to benefit from the competitive advantage linked to the investment made in the existing nuclear fleet, while giving EDF the financial capacity to ensure the economic sustainability of its generation facilities to meet the needs of PPE (French multi-year energy programme) in low price scenarios”.

\(^{(1)}\) Order of 17 May 2011
Maximum annual sales volume by EDF for alternative suppliers: 100TWh

Volumes sold in 2018: 94.6TWh

In November 2018, ARENH requests from alternative suppliers for 2019 amounted to 132.93TWh. The volume was therefore clipped to the legal ceiling of 100TWh.

Volumes sold for 2019:
- 49.6TWh for H1
- 50.4TWh for H2

NB: for 2019, the volume sold for network loss coverage was 20.4TWh

Source: CRE
(1) The ARENH volumes to be delivered evolved in the first half of 2015 due to the termination of the framework agreement with 4 suppliers
(2) Difference between half year estimated by EDF from the annual data provided by the CRE, and likely to change during the year through the application of legal, regulatory and contractual provisions (sub-annual window, cancellations, defaults, etc.)
Public service mission: EDF and the LDCs\(^{(1)}\) must buy electricity generated by certain electricity generation facilities (or pay them an "additional remuneration") whose development the French government would like to encourage, at rates set by the government (by decree or through tenders)

Pursuant to Article L. 121-7 of the French Energy Code, EDF is compensated for the additional costs resulting from the purchase obligations (PO) on the basis of a reference to prices from wholesale electricity markets, known as “avoided cost” (compensation). Starting from 1 January 2017, the costs of managing these contracts are also compensated.

### EDF-Purchase obligations:

According to the CRE ruling of 16 December 2014, the energy of purchase obligations is resold on the markets:

- the near certain component (i.e. predictable over the medium term) directly by tenders under transparent and non-discriminatory conditions
- the variable component (i.e. predictable for the day ahead) on EPEX Spot via EDF Trading (in the dedicated book).

Since the capacity mechanism has been set up, EDF has in charge the certification of the facilities under the purchase contract and resells these capacities at the auctions (nearly 6GW)

---

\(^{(1)}\) Local distribution company

\(^{(2)}\) Excluding Corsica and French overseas departments
Established by the NOME law, approved by the European Commission on 8 November 2016

- Latest version of the rules published by decree on 21 December 2018 (explicit participation of cross-border assets and implementation of long-term tender procedures)
- Objective: to remunerate the means of generation and load shedding useful to security of supply
- Definition of the criterion of security of supply by the public authorities: 3h of shedding on average per year

Operated by RTE

- Definition of calculation methods and identifying peaks
- Issue of capacity certificates, controls and management of capacity registry and settlement of gaps
- Ex-post calculation of each supplier’s obligations and the actual availability of certified facilities
- Provision of information on supply and demand for certificates

Source: DGEC, RTE
CAPACITY MECHANISM IN FRANCE: STANDARD CALENDAR

**Year - 4**
- Certification of existing capacities
- Certification of new capacities (including demand-side response)
- Continuous over-the-counter exchanges
- Adjustments by operators, at progressive cost

**Capacity auctions organized by EPEX Spot**
- 15 auctions on the 4 years before the delivery year

**Year - 1**
- Certification of new capacities (including demand-side response)
- RTÉ controls the effective availability of the certified capacity

**Delivery Y Year**
- Budgeting of new capacities

**Year + 1**
- Implementation by suppliers of peak-load shedding measures in their customer portfolio
- Estimated amount of obligations of suppliers

**Year + 3**
- Financial settlement of deviations for capacity not available
- Deadline for transfer of certificates
- RTE calculates the final amount of obligations

**Source:** RTE
### CAPACITY MARKET IN FRANCE: IMPACT ON EBITDA (YEAR Y)

#### Valuation method for certificates

<table>
<thead>
<tr>
<th>Timing of EBITDA impact</th>
<th>Certificates concerned</th>
<th>Price</th>
<th>Volumes concerned&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass through of the capacity price to end customers (market share of supply contracts and tariffs)</td>
<td>At the time of energy delivery</td>
<td>Certificates for delivery year Y</td>
<td>Calculated from auction prices</td>
</tr>
<tr>
<td>Transfers related to ARENH volumes (incl. ARENH share of supply contracts and tariffs)</td>
<td>At the time of energy delivery</td>
<td>Certificates for delivery year Y</td>
<td>ARENH product at €42/MWh includes delivery of associated capacity guarantees</td>
</tr>
<tr>
<td>Certificate sales&lt;sup&gt;(2)&lt;/sup&gt; to alternative suppliers (via auctions or OTC)</td>
<td>At the time of closing of the transactions</td>
<td>Any certificate</td>
<td>Auction price (or negotiated price for OTC sales)</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> The volume of certified capacity certificates in France may be higher than RTE’s estimate of demand. In such a case, a certain amount of the certificates held by EDF would not be sold.

<sup>(2)</sup> Sales volumes net of purchases.
## CAPACITY MARKET IN FRANCE: IMPACT FOR EDF

### Capacity auctions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Volume of certified capacities

- 2017: 76GW
- 2018: 77GW
- 2019: 75GW

### EBITDA impact

- + €580m\(^{(1)}\)
  - Cumulative impacts on regulated sales tariffs\(^{(2)}\), offers at market prices and purchases/sales on the wholesale markets
- The 2018 MRP will apply to the billing of the vast majority of our customers on market-price contracts in 2018 and has been be incorporated into the new February 2018 schedules for customers on regulated tariffs\(^{(3)}\)
- In 2019, most of the customers on market-price will be mainly invoiced on the basis of the 2019 price of the capacity auctions. The 2019 MRP should be incorporated into the changes of the new schedules for customers on the 2019 regulated tariffs

---

\(^{(1)}\) Takes into account the sales on the 2018 Capacity Guarantees market realised by EDF in the last two sessions in 2017

\(^{(2)}\) The MRP of the 2017 capacity of €10/kW was included in the tariff bareme of July 2017

\(^{(3)}\) Please refer to the deliberation of the CRE of 11 January 2018

---

Part of this capacity cannot be directly priced. In particular, the ARENH subscriptions have a negative impact on capacity income insofar as the Arenh product at €42/MWh includes the delivery of capacity guarantees by EDF

- 10.8GW of capacity certificates transferred to suppliers having subscribed to ARENH for 2018
EDF GROUP MAIN BUSINESSES

- NUCLEAR P. 60
- RENEWABLES P. 98
- THERMAL POWER P. 124
- REGULATED ACTIVITIES (NETWORKS) P. 129
- OPTIMISATION & TRADING P. 141
- CUSTOMER SOLUTIONS P. 154
- ENERGY SERVICES P. 167
- GAS P. 177
A RECOGNISED, INNOVATIVE AND DIGITAL CUSTOMER RELATIONSHIP

30 million customer sites of EDF offers, including more than 1.5 million in gas

In the electricity market, nearly 280TWh marketed in 2018. Market shares of ~ 85% B2C and ~65% B2B

In the gas market, more than 30TWh marketed in 2018, representing a market share of 6.6%\(^{(1)}\)

High customer satisfaction in France

- Satisfied customers

9 out of 10 customers

Close customer relations based on personalised, human and digital services

- 5,000 customer advisers serving customers
- 300 “inclusion” advisers
- Sales teams in 8 Regional Directorates serving Businesses and Local Authorities
- All teams based in France, close to customers

Did you know?

All EDF Customer Relationship Centers are located in France. They help to maintain employment areas throughout the territory. EDF is committed to promoting the choice of this social model. A choice shared by the French since 94% of them consider that a customer service based in France is important\(^{(2)}\). EDF reaffirms its commitment to continue its labeling process that has been in place for more than 10 years and is an essential component of its strategy as a responsible employer. The next label adopted by EDF will enable the adoption of a demanding standard based on the ISO 26000 standard. It will value both the quality of the company's social practices in relation to customer relations, particularly through the training of customer advisors or the attention paid to their working conditions, as well as their choice of location.

(1) Excluding Corsica and overseas

(2) Excluding Corsica and overseas

A continuous evolution of our offers and services: to innovate both for and with our customers
EDF CUSTOMER SOLUTIONS IN FRANCE: RESIDENTIAL CUSTOMERS

Energy offers tailored to customer expectations

- Electricity supply offers tailored to customer expectations: the regulated sales tariff and new market offerings
  - A new online offer, at attractive prices launched in 2018: Digiwatt
  - The “Gamme Vert Electrique” with:
    - Vert Electrique
    - Vert Electrique Week-end (for customers equipped with Linky)
    - Vert Electrique Auto (for customers with an electric vehicle) launched in 2018
  - The “Gamme Avantage Gaz”:
    - Avantage Gaz
    - Avantage Gaz Durable, incorporating carbon offsetting
    - Avantage Gaz Connecté, integrating the management of the individual boiler

Services and support to reduce energy consumption

- An offer of troubleshooting assistance
- Three options of troubleshooting assistance, and an efficient and rapid intervention in case of failure in the home
- “Assurénergie” offer to help the customers to pay their bills in the event of hardship
- Customer support dedicated to energy savings with an online path on EDF residential customers’ “Mes Ecos et moi” website:
  - Energy saving tips
  - Électriscore, a platform for comparing electrical appliances
  - The website Prime-energie-edf.fr to receive financial assistance for renovation work and a “EDF Home Solutions Partners” network

Innovative digital solutions

- The e.quilibre solution allows customers to monitor and control their consumption. The customers equipped with Linky could monitor their current daily consumption in euros and kWh
- For customers equipped with Linky meter, the Fil d’Actu solution, available on EDF & Moi application, gives them access to information to understand their consumption and save energy (weather impact, similar homes, heating part, adapted eco-friendly behaviours, etc.).

EDF innovates in order to be the supplier for the well-being of its customers

With a high quality services and reference offers

24.5 million sites
120,3TWh sold

1.45 million sites
13.4TWh sold

5,000 customers advisors, all located in France

6.8 million EDF & Moi app downloaded

152 million visits to websites and the EDF & Me app

Co-innovation with ~6,000 “pulsers”

Energy saving tips
Électriscore, a platform for comparing electrical appliances
The website Prime-energie-edf.fr to receive financial assistance for renovation work and a “EDF Home Solutions Partners” network
EDF CUSTOMER SOLUTIONS IN FRANCE: BUSINESS MARKET
(COMpanies, PROfessionALS AND LOCAL AUTHORITIES)

EDF is positioned as local business partner to assist its customers in the energy transition and their competitive challenges

Energy offers for all consumption profiles

- Electricity and gas supply offers tailored to every customer segment: tailor-made offers, guaranteed price offers, differentiated prices offers by time-slots and by season (off-peak hours/peak hours, Matina, Estivia)...
- Packaged offers for simplicity with the Performance package (Guaranteed contract and SuiviConso service (to monitor consumption)) and Tandem service (electricity and gas).
- All customers have the opportunity to choose a Renewable Energy option.

An extended range of services

- Services to facilitate contract management: electronic billing, consolidated billing…
- Services to control and monitor the consumptions: SuiviConso, AnalyseConso…
- Troubleshooting assistance offer for electrical, gas and plumbing issues
- Local services for business customers: when they set-up, with Bénéfices-Pro and at all times on Izi-by-edf platform
- Assistance services in the energy transition: self-consumption, energy audit, ISO 50001 energy management …

An omnichannel and personalised relationship

- A personalised, human and digital customer relationship: advisors in France, information at every stage of the customer journey, websites
- SMS interactions: SMS conversations between advisors and customers to meet their requests
- Launch of Mr EDF Bot Entreprises available on the website: a chatbot to answer questions about invoicing (account balances, debit dates, etc.)
- Specific tools for large customers: Business Board to track sourcing optimisation and send purchase orders with one click

Key figures

- 1.5 million customers
- 163TWh sold
- 4.5 million Visits to website
- 17,7TWh sold

Specific support for local authorities and social housing lessors

EDF has developed offers tailored to the needs of local authorities and private actors: local energy offers and services, advices for the smart city (energy policy, renewable energy, lighting, mobility) ; or contribution to combat energy insecurity. Special measures for social landlords are also proposed to improve the energy efficiency of social housing: it is the CEE (energy efficiency certificate) production tool “amount of charges”
Sales to end customers\(^{(1)}\)(\(^{(2)}\))

<table>
<thead>
<tr>
<th>Year</th>
<th>Local authorities, companies and professionals</th>
<th>Residential customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Market offers including transitional offer</td>
<td>Regulated tariffs</td>
</tr>
<tr>
<td>2016</td>
<td>146.6</td>
<td>133.9</td>
</tr>
<tr>
<td></td>
<td>39.4</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>145.4</td>
<td>127.6</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>137.4</td>
<td>119.9</td>
</tr>
<tr>
<td></td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

- \(^{(1)}\) Rounded to the nearest tenth
- \(^{(2)}\) Including EDF’s own consumption
- \(^{(3)}\) Blue professional tariff, LDC (Local Distribution Companies) at transfer price and Yellow and Green tariffs, below 36kVA
ELECTRICITY SUPPLY IN FRANCE – SALES UNDER REGULATED TARIFFS SPLIT BY COLOUR

In TWh

Sales to end customers for 2018 (1)(2)

- Local authorities, companies and professionals
  - Market offers including transitional offer
- Residential customers
  - At market offers
- Local authorities, companies and professionals
  - At regulated tariffs
- Residential customers
  - At regulated tariffs

137.4
34.9
119.9

LDC(3) transfer price
Green and yellow tariffs(4)
Blue non-residential tariff
Blue residential tariff

(1) Rounded to the nearest tenth
(2) Including EDF’s own consumption
(3) Local Distribution Companies (LDCs)
(4) Of which Green tariff for 0.1TWh and green tariff for 0.2 TWh - Tariffs lower than 36 kVA
REGULATED SALES TARIFFS IN FRANCE: CHANGE IN 2018

Residential Blue tariff\(^{(1)}\)

<table>
<thead>
<tr>
<th>Date</th>
<th>Energy + fees</th>
<th>Capacity</th>
<th>Cost to serve(^{(2)}) &amp; Margin</th>
<th>Catch-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/02/2018</td>
<td>49.0</td>
<td>14.7</td>
<td>15.3</td>
<td>1.7</td>
</tr>
<tr>
<td>01/08/2018</td>
<td>49.6</td>
<td>14.7</td>
<td>15.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

-0.5% -€0.5/MWh

Average bill breakdown, VAT included (Blue residential customer)

<table>
<thead>
<tr>
<th>Component</th>
<th>01/02/2018</th>
<th>01/08/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency Certificate (TURPE)</td>
<td>42.9</td>
<td>42.9</td>
</tr>
<tr>
<td>Capacity Costs (CSPE)</td>
<td>14.7</td>
<td>14.7</td>
</tr>
<tr>
<td>Cost to serve &amp; Margin</td>
<td>15.3</td>
<td>15.3</td>
</tr>
<tr>
<td>Generation and supply costs</td>
<td>49.6</td>
<td>49.6</td>
</tr>
</tbody>
</table>

€170/MWh\(^{(3)}\)

- Taxes: 38.5
- CSPE: 22.5
- TURPE: 49.5
- Generation and supply costs: 59.5

(1) Source: Data from the deliberation of the CRE of July 12, 2018
(2) Including cost of Energy Efficiency Certificates
(3) Half-rounded figures
FRANCE: COMPONENTS OF THE COST STACKING METHOD FOR THE BLUE TARIFF

1. ARENH
2. Market complement - Energy
3. Market complement - Capacity
4. Supply costs
5. Normal margin on supply activity
6. TURPE

2. Cost calculated according to average consumption characteristics and observed forward market prices
3. Capacity obligation mechanism requiring suppliers to have capacity guarantees as from 2017 covering their customers’ peak consumption
4. Commercial costs of a supplier at least as efficient as EDF in the business of supplying electricity to those customers having subscribed contracts under regulated tariffs
5. Margin earned on electricity supply activity:
   - Remuneration of risks associated with supply
   - WCR coverage
   - Return on capital employed in electricity sales

Source: Decree no. 2014-1250 of 28 October 2014 modifying the decree no. 2009-975 of 12 August 2009 on regulated tariffs
# FRANCE: ENERGY SAVING CERTIFICATES SYSTEM

## Implemented in 2006, confirmed in 2015
- Response to requirements of the European Directive on energy efficiency
- Article 30 of the energy transition law for Green Growth: a new EEC obligation benefitting households suffering from energy poverty, in addition to the traditional EEC obligation

## Enhanced targets, new ambitions
- A 2 May 2017 decree sets the national obligation levels for the 4th period 2018-2020 to 1600TWhc
  - Ambitious doubling of these levels compared to the 3rd period 2015-2017 (700TWhc for the “standard” obligations and 150TWhc for the obligations that are to benefit households in situations of energy poverty)
  - Including 400TWhc for the benefit of households that suffer from energy poverty and 1,200TWhc of obligation of classic CEE

## 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
- Actively promote energy efficiency to their customers
  - Households, local authorities, social housing landlords or business/professionals

## Mechanism
- EDF is the first supplier with the largest obligation and intervenes in several areas
  - Financial incentive for energy renovations in accommodation (individuals, social housing landlords, building management companies), and of professional customers and local communities
  - Financing national programs (for example: ADVENIR on electric vehicles, FEEBat on the training on craftsman, Habiter mieux from ANAH in the fight against energy poverty)
**Residential customers**

- Highly competitive market with ~60 suppliers \(^{(1)}\). 27% of market share gained by small and medium suppliers (end October 2018).
- During 2018, EDF Energy supplied 11.7TWh of electricity and 28.8TWh of gas for the domestic segment.
- As at 31 December 2018, EDF Energy had 3.0 million electricity accounts and 1.9 million gas accounts on this segment.
- 3rd place among Major Suppliers was in the Citizen’s Advice Complaints (domestic) League Table.
- EDF Energy continues to achieve high levels of customer satisfaction assisting a high level of recommendations (Advisor Recommendation score of +53).
- 68% of transactions completed by customers using digital self-service. Digital Net Ease Score of 4.2 out of 5 achieved in digital transition.
- Ofgem announced an increase to the Default Tariff cap on 7th February 2019, increasing the price by £117 for a dual fuel customer at typical consumption from 1st April 2019. EDF Energy has announced a price increase to Standard Variable tariff in line with the Default Cap, effective from 1st April 2019 \(^{(2)}\). All other major suppliers have announced price increases in line with the Default cap.

**Business customers**

- In 2018, the non-domestic segment supplied a total of 32.3TWh of electricity, 1.9TWh to 203,434 small business customers (“SME”) and 30.4TWh to medium and large business customers (“I&C”) accounts.
- Large Business has managed to grow its live on supply volume over 2018 by acquiring and onboarding two strategic prospects, Hanson and Manchester Airport Group.

\(^{(1)}\) OFGEM data
\(^{(2)}\) For more information please see EDF Energy’s press release of 12 April 2018 and 5 July 2018

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**Innovation**

- Blue Lab, is an internal accelerator team, that brings concepts to market through a rapid development approach. A high focus is on the Internet of Things (IoT) with multiple applications being developed. One such project has been the introduction of Howz, a product that helps to monitor energy usage to confirm activity in the house in a non intrusive manner.
- Blue Lab has also developed a number of products aimed at helping customers save money with the introduction of Powervault – a smart way to store free solar or cheap energy from the grid to reduce energy bills.
- In addition Blue Lab has founded two spin-off projects - PowerShift, which aims to be a platform for aggregating and commercialising demand side response as well as Hoppy, a novel Home Services, energy and home media marketplace.
- 515k smart-meters installed by EDF Energy for its customers in 2018.
Edison, through its 100% controlled company Edison Energia is involved in the electricity and gas supply to Italian customers.

The acquisition of the Italian activities of Gas Natural/Naturgy in 2018 allowed to increase by 50% Edison’s client base and to expand the company’s presence in Central and Southern Italy.

**Customer Solutions in Italy: Edison**

**Business Market (B2B)**
- Edison is a leader in the B2B market both in power and gas
- Very fragmented and competitive market
- Market share of 9% for power and 24% for gas

**Retail Market (B2C)**
- Late 2008: Edison entered the retail free market in power and gas, positioning itself as the new real alternative to incumbents (Enel, Eni, ex-Municipalities)
- Strong growth in the retail market from 2008 to 2013. Since 2014: increase of customer base quality (70% SDD payments and >50% electronic bill)

**New Innovative Offers and Services**
- Edison World Platform: a suite of products and services for a connected, safe and comfortable home
  - Edison Casa Relax: 24 h x 365 assistance for electricity system, Unlimited interventions, Monthly fee.
  - Edison My Comfort: Sale, Installation, Maintenance, Insurance of cooling and heating systems.
  - Edison Energy Control(4): device which enables families to supervise, through a data reader and a digital platform, their energy spending in real time.
  - Smart living: a single Hub and single App to manage and optimise the utilisation of a very high number of connected devices.
  - My Sun: a new innovative service that combines a photovoltaic system, a storage and a commodity offer in order to give customers “zero bill” up to 10 years.
  - Edison Plug & Go: electric cars long rental (2-5 years), installation of a charging wall box and app (for public recharges).

**Power Sales in 2018**
- 11.6TWh

**Gas Sales in 2018**
- 6.7bcm(1) o/w
- 2.0bcm resellers
- 4.7bcm business
- 614Mcm(2)

**Contracts**
- 656,221 contracts(3)
- 936,206 contracts(3)

---

(1) Billion of cubic meters
(2) Million of cubic meters
(3) Data at end 2018
(4) Already launched in 2013
EDISON: ACQUISITION OF GAS NATURAL’S ASSETS IN ITALY(1)

- An important expansion of Edison’s customer portfolio, in line with the Group’s strategic goals
- Fit with Edison retail portfolio and operations
  - Customer portfolio: significant size and good quality (low churn rate and good payment record)
  - Mostly gas regulated customers, with optimal geographical fit, strengthening Edison’s position in the south of the country
- Development of significant scale synergies

Customer portfolio evolution

<table>
<thead>
<tr>
<th>In thousands of sites served</th>
<th>Edison</th>
<th>Gas Natural</th>
<th>Attiva</th>
<th>AMG</th>
<th>Edison + Gas Natural + Attiva + AMG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential – electricity</td>
<td>433</td>
<td>485</td>
<td></td>
<td></td>
<td>923</td>
</tr>
<tr>
<td>Residential – gas</td>
<td>462</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>164</td>
<td>184</td>
<td></td>
<td></td>
<td>1,592</td>
</tr>
</tbody>
</table>

+50%

Geographic distribution of retail contracts

(1) The acquisition of Gas Natural Vendita Italia was completed on 22 February 2018. Gas Natural Vendita Italia was renamed Edison Energie and merged into Edison Energia with effect January 1, 2019
CUSTOMER SOLUTIONS IN BELGIUM: EDF LUMINUS

- The second largest player in the Belgian energy market, Luminus supplies electricity and gas to more than 1.7 million residential and professional customers and local authorities. EDF holds 68.63% of Luminus via its wholly-owned subsidiary EDF Belgium.

Wind: Luminus is present in renewable energy through 7 hydropower plants and 52 onshore wind farms, for a total of 189 turbines. Since 2015, the company has been the leader in onshore wind farms in Belgium and has an installed capacity of 440MW. In 2018, the Group erected 24 wind turbines for a total capacity of 62.8MW. In the same year, EDF acquired MegaWindy CVBA, which operates onshore projects in the Flemish region.

Thermal:
- Luminus has a thermal park composed of several plants (combined cycles and open cycles) for a total installed capacity of 1,208MW.
- At the end of 2018, Luminus returned the Ham plant to the market to help the country secure its electricity supply for the 2018-2019 winter.
- Now back on the market, Seraing’s steam gas turbin, combined cycle plant fulfilled its strategic reserve contract for the period from November 2017 to the end of October 2018.

Energy services:
- At the end of 2018, the B2C service portfolio exceeded 175,000 contracts, for its “Comfort” services in the event of unexpected damages to homes, photovoltaic installations, as well as for the sale and management of an intelligent thermostat (Netatmo).
- EDF continued its expansion strategy in 2018 in HVAC (heating, ventilation, air conditioning) energy services by acquiring the companies M. Lemaitre SA through Newelec and Holding Léonard SPRL through Dauvister. The subsidiary ATS Gezel II, a specialist in heating and ventilation, also acquired the heating contractor Acar NV to expand its service offering.
- In 2018, as part of its “Plan Lumières 4.0” plan, SOFICO (the Wallonia infrastructure fund) awarded the PPP contract (Public and private partnership) to light the highways in Wallonia to the LuWa consortium made up of Citelum, Luminus, CFE and DIF.
- The project to refit and connect the lighting of Wallonia’s highway network will take 20 years to complete.

Best employer 2019
In early 2019, Luminus was awarded the “Top Employer” label for the seventh year in a row.

Luminus Energy Management - At the end of 2018, Luminus launched an application enabling customers to manage their energy consumption by following real-time market price trends.

My Luminus also allows them to be alerted when their consumption exceeds their normal consumption levels.

Key figures
- 2,129MW installed
- ~20% market share
- 5.2TWh of electricity generation
- ~97% B2C
- 1.7 million delivery points.

Did you know?
- In early 2019, Luminus opened its first wind farm in a forestry area. Thanks to an annual output of 36.7GWh, its six wind turbines can provide green energy to 9,200 homes and to eliminate nearly 16 tons of CO2.
- In early 2019, the Group is also presenting a project for four new wind turbines in three sections of the city of Mons. Annual generation is expected to reach 36GWh, providing green energy to 9,000 households per year.

(1) See press release of 25 January 2019
(2) See press release of 14 February 2019
EDF GROUP MAIN BUSINESSES

- NUCLEAR P. 60
- RENEWABLES P. 98
- THERMAL POWER P. 124
- REGULATED ACTIVITIES (NETWORKS) P. 129
- OPTIMISATION & TRADING P. 141
- CUSTOMER SOLUTIONS P. 154
- ENERGY SERVICES P. 167
- GAS P. 177
Ambitious target of €11bn of turnover in B2B energy services in 2030

To meet this challenge, EDF is developing a wide range of services to support all our customers in the energy transition with the goal of consuming less, but consuming better

Group’s beliefs:
- Energy efficiency is a major driver of the energy transition
- The proposed solutions must adapt to each customer’s situation and must be sustainable over the long term
- The development of digital technology allows more innovation and performance

Smart home

Smart Building

Smart City

Smart Factory
SERVICES FOR THE GROUP’S INDIVIDUAL CUSTOMERS

Strong expectations of Group’s individual customers:
- homes are becoming increasingly connected,
- customers want to control their consumption and limit their impact on the environment, in search of reliable solutions and at the right price

Our range of service offers is growing, for more serenity and to support the challenges of today and tomorrow:

- Maintenance and troubleshooting of heating and hot water equipment
- Solar photovoltaic solutions « Mon Soleil & moi » for self-consumption
- Electric mobility at home and when traveling with the Izivia Pass
- The control of heating, air quality, the charging station of the electric vehicle, etc. by voice and by touch
- Services to improve your daily comfort: small jobs, renovation projects, installation of equipment…
SERVICES FOR THE B2B CLIENTS

The EDF Group, through its expertise, can support companies, industries and territories throughout the entire energy chain and on projects as different as heat networks, intelligent lighting, low-carbon decentralized generation, energy management, sustainable mobility or eco-neighbourhoods.

Combining digital expertise, economic and low carbon performance, EDF and its subsidiaries invent innovative solutions tailored to each need, as a sustainable energy partner.

**Smart Building**
- Energy efficiency, buildings, energy management, self-consumption, heat recovery, ...

**Smart Factory**
- Data, artificial intelligence, predictive maintenance, energy efficiency, circular economy, economic performance, ...

**Smart City**
- Local production, heat networks, renewable and recovery energy, thermal and electrical smart grids, collective self-consumption, urban services, ...
SERVICE SUBSIDIARIES: EXPERTISE ON THE ENTIRE B2B ENERGY CHAIN

EDF aims to double its turnover by 2025 on energy services for businesses and local authorities markets and to increase this figure to €11bn by 2030.

To affirm its position in this area, EDF launched, in June 2017, "EDF Solutions énergetiques", a new banner that highlights its know-how and the skills of its subsidiaries, increasing the visibility of each of its brands (1).

Did you know?

(1) For more information see the press release of 20 June 2017.
DALKIA: A MAJOR PLAYER IN THE ENERGY TRANSITION AT THE SERVICE OF ITS CUSTOMERS

- A leader in energy services in France, Dalkia has been helping regions accelerate their sustainable energy performance for 80 years.

- Presence at each stage of the value chain: from decentralised generation to demand-side management.

- Innovation and digital technologies helping development:
  - Digital offer dedicated to the industries to accompany them in the factory 4.0.
  - Development of digital tools for operational staff.
  - Deploying a new customer area.

EDF’s ambition is to develop significant positions in energy services, thanks to the know-how and expertise of Dalkia and its subsidiaries.
# DALKIA: TAILOR-MADE SOLUTIONS IN FRANCE AND ABROAD

## Specialty subsidiaries

<table>
<thead>
<tr>
<th>Dalkia Wastenergy</th>
<th>Dalkia Froid Solutions</th>
<th>Dalkia Smart Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valorisation of energy waste</td>
<td>Industrial and commercial refrigeration</td>
<td>Design and realization of energy efficiency solutions</td>
</tr>
<tr>
<td>Dalkia Biogaz</td>
<td>Cram</td>
<td>Dalkia Air Solutions</td>
</tr>
<tr>
<td>Valorisation of biogas</td>
<td>Building energy services</td>
<td>Nitrogen compressed air and breathable air production</td>
</tr>
<tr>
<td>Dalkia Air Solutions</td>
<td>AsterIoT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## International subsidiaries

<table>
<thead>
<tr>
<th>United Kingdom</th>
<th>Russia</th>
<th>Ireland</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIRU UK</td>
<td>IMTECH UK</td>
<td>IMTECH Ireland (SUIR)</td>
<td>ZEC Katowice</td>
</tr>
<tr>
<td></td>
<td>Fenice Rus</td>
<td></td>
<td>Matex Controls</td>
</tr>
<tr>
<td>United States</td>
<td>Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groom Energy Solutions</td>
<td>TIRU Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aegis Energy Services</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Smart and efficient lighting reference, Citelum has developed a whole range of connected services to meet the new challenges of its public and industrial customers: energy saving, security, mobility, attractiveness, sustainable development, etc.

Projects and expertise across the value chain, from design to operation

An innovation pole based on:

- Reliable technological partners: manufacturers in lighting, security, mobility, IoT, etc. sectors, start-ups
- the collaborative platform for urban space management, MUSE®

MUSE® PLATFORM

- Inventorying, geolocation, urban equipment tracking
- Fast and efficient planning and coordination of maintenance and operations
- Monitoring the operation and consumption of equipment
- Management of daily and special events and communication between stakeholders

MUSE® in numbers

- 2,500 users
- Present in 12 countries
- 100 hosted sites
- 1.7m connected objects and urban equipment (light points, traffic lights, cameras, sensors, etc.)

Citelum Services

Ranges to suit all needs and customer profiles:

- Intelligent lighting: renovation, interior lighting, remote management, artistic lighting etc.
- Security: Video protection, traffic light and speed radars, warning systems, etc.
- Mobility: tricolour light signalling, intelligent parking, electric vehicle charging solutions, etc.
- Communication and information: variable message signs, Wi-Fi, Li-Fi etc.
- Quality of life: sensors of air quality, noise etc.
CITELUM: INNOVATION, THE GROUP’S ENGINE

Smart and connected infrastructures

Citelum builds, with and for its customers, Smart City projects that are tailored to their needs and focused on the quality of life of citizens.

Citelum has renovated the lighting in Lonato del Garda, Italy, using LED technology and has installed video surveillance, connected traffic lights, an intelligent parking solution, variable message signs, WiFi and environmental sensors.

Beyond reducing energy costs and CO₂ more than 60% of the city’s goal, this project’s objective is to enhance citizen safety, streamline mobility and improve communication.

At the end of 2018, the LuWa consortium was chosen as the preferred bidder for the “Lumières 4.0” plan for the major road axes by the Sofico Board of Directors.

LuWa, composed of Citelum, EDF-Luminus, CFE, DIF infra 5 participations 1 B.V. and their partners, will be responsible for refitting 100,000 luminous points with LEDs along the roads which will be incorporated with various remote management systems and sensors. The fully connected and intelligent network will allow for the modulation of light intensity according to urban flows, as well as remote control via the traffic management centre. The project aims for energy savings of more than 70% and the avoidance of 166,000 tonnes of CO₂.

Creative solutions for added value already on the market

Smart lighting:

- In L’Aquila, Italy, Citelum has set up the first European system that automatically regulates the intensity of lighting according to the circadian wake-sleep rhythm. The system, incorporated in street lights, adjusts lighting from cooler colours that are closer to sunlight in the early evening to a warmer colour in the middle of the night.

Charging stations for electric vehicles:

- In Calais, Citelum and Ubitricity are connecting charging stations directly to the existing public lighting infrastructure. These charging points require little work to install, and can be used simply by scanning a QR code to start the charging. Users are then billed according to the time used.

Noise sensors:

- Citelum installed noise sensors connected to the street lighting of several public squares in Sant Cugat, Spain. As soon as the noise on the spot exceeds the authorised limit, the street lights begin to flash to alert users and encourage them to make less noise.
EDISON: ACQUISITION OF ZEPHYRO

- In 2018 Edison, through its fully owned subsidiary Fenice, acquired the majority stake of Zephyro Spa\(^{(1)}\) for a total of about €106m
- Zephyro is a leading Italian energy efficiency player, mostly active in the Public Administration sector
- It is specialised in integrated services for energy management, mainly for hospitals and is focused on energy improvement, which is characterised by high technological complexity and relevant financial impacts, energy supply and O&M
- The company has a significant track record in terms of being awarded contracts over the past few years, well above the market average

Rationale behind the acquisition

- Become one of the leading players in the Italian energy efficiency market, especially in the Public Administration segment by focusing on energy intensive customers
- Build a platform for organic growth and take advantage of an existing sizable backlog pipeline (€750m)
- Develop synergies with Edison in terms of geographical integration and cost savings

Main economic figures in 2018

- Turnover: €72m
- EBITDA: €5.3m and ~ 250 employees

Geographical presence

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\(^{(1)}\) 99.93% of the share capital represented by Zephyro common shares and 99.499% of the total share capital
EDF GROUP MAIN BUSINESSES

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EDF IS WELL POSITIONED ON THE GAS VALUE CHAIN

**Commerce**

- Dual-fuel offers (electricity and gas) and value added services to clients

**Trading**

- Supply of EDF’s gas fired power plants
- Seeking arbitrages and optimising supply strategies
- Control the cost of flexibility and regulated activity in Italy
  - Examples: Cellino, Collalto and San Potito & Cotignola (Italy), Etzel storage (Germany)

**Storage**

- 4 long term gas import contracts in Italy and 1 in France

**Supply**

- Small scale LNG to support the development of sustainable heavy-duty and maritime transport
- LT LNG regassification capacity available in France, Italy and Belgium
- Development of import infrastructures to secure diversification of gas supply sources

**Infrastructures**

- Expertise in the exploration and production of oil and gas in Italy and abroad. Activity carried out also in partnership with other operators.
  - 97 concessions and exploration permits
  - 209 Mboe hydrocarbons reserves
  - Example: Abu Qir gas field in Egypt

**Exploration & Production**

- Hydrocarbons exploration licenses
- Hydrocarbons production concessions
- Gas pipelines under development

- Main gas downstream markets
- Storage centers
The total volume of EDF's long-term gas contracts is 15.4 bcm/year\(^{(1)}\), of which 14.4 bcm imported by Edison.
EDF is present on the European gas market for over 10 years, with ~5.1m clients and ~152TWh sold

Dual fuel offer with value added services

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Customers</th>
<th>TWh sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRANCE (EDF SA)(^1)</td>
<td>~ 1.7 million</td>
<td>31.0</td>
</tr>
<tr>
<td>ITALY (EDISON)</td>
<td>~ 0.9 million</td>
<td>77.5</td>
</tr>
<tr>
<td>UK (EDF ENERGY)(^2)</td>
<td>~ 1.9 million</td>
<td>29.0</td>
</tr>
<tr>
<td>BELGIUM (EDF LUMINUS)</td>
<td>~ 0.6 million</td>
<td>14.0</td>
</tr>
</tbody>
</table>

\(^1\) Excluding Corsica and the French overseas department

\(^2\) Excluding Northern Ireland
EDF TRADING: JERA AND EDF TRADING EXTEND THEIR PARTNERSHIP TO LNG

LNG is a new chapter in the long-term partnership between JERA Co Inc (“JERA”) and EDF, which was cemented by the creation of JERA Trading in April 2017 (1/3 EDF Trading, 2/3 JERA).

EDF’s LNG trading and optimisation business has acquired a significant scale, in particular since the commissioning of the Dunkerque LNG terminal in 2017. JERA is a major player in the sector.

The combined optimisation of the JERA and EDF LNG portfolios will represent a significant increase in scale which will maximise the scope and the value for both partners without requiring any investment.

EDF expects a return from EDF Trading’s 33% stake in JERA Trading and will report its share of the LNG optimisation activity in its operating results.

Key Steps in EDF/JERA Partnership

- **Coal trading partnership**
  - 2008

- **Coal Trading Corporate JV**
  - 2017

- **LNG trading & Optimisation**
  - 2018\(^{(1)}\)

\(^{(1)}\) Start of operations expected in April 2019
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<td>COUNTRY PROFILE</td>
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- FOCUS ON CREDIT  
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- PROVISIONS & DEDICATED ASSETS  
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- CSPE  
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HISTORICAL FINANCIALS: EBITDA

EBITDA growth

<table>
<thead>
<tr>
<th>Year</th>
<th>In millions of Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>16,099</td>
</tr>
<tr>
<td>2014</td>
<td>17,279</td>
</tr>
<tr>
<td>2015</td>
<td>17,601</td>
</tr>
<tr>
<td>2016</td>
<td>16,614</td>
</tr>
<tr>
<td>2017</td>
<td>13,742</td>
</tr>
<tr>
<td>2018</td>
<td>15,265</td>
</tr>
</tbody>
</table>

2018 Group EBITDA by segment

- France – Generation and supply activities: 41%
- Other activities: 6%
- Other international: 2%
- Italy: 5%
- UK: 5%
- Framatome: 1%
- EDF Renewables: 6%
- Dalkia: 2%
- Regulated activities: 32%
- France – Regulated activities: 32%

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

Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years.
HISTORICAL FINANCIALS: NET INCOME

Evolution of Net income excluding non-recurring items

Evolution of Net income – Group share

In millions of Euros

Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years

Net income excluding non-recurring items = Net income Group share excluding non-recurring items
HISTORICAL FINANCIALS: INVESTMENTS AND OPEX

Change in net investments\(^{(1)}\) since 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Net Investments (in millions of Euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>11,893</td>
</tr>
<tr>
<td>2014</td>
<td>12,190</td>
</tr>
<tr>
<td>2015</td>
<td>13,453</td>
</tr>
<tr>
<td>2016</td>
<td>12,801</td>
</tr>
<tr>
<td>2017</td>
<td>16,003</td>
</tr>
<tr>
<td>2018</td>
<td>14,044</td>
</tr>
</tbody>
</table>

Opex\(^{(2)}\) organic change\(^{(3)}\) from 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Organic Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1.1%</td>
</tr>
<tr>
<td>2014</td>
<td>0.9%</td>
</tr>
<tr>
<td>2015</td>
<td>-1.4%</td>
</tr>
<tr>
<td>2016</td>
<td>-2.0%</td>
</tr>
<tr>
<td>2017</td>
<td>-1.5%</td>
</tr>
<tr>
<td>2018</td>
<td>-0.3%</td>
</tr>
</tbody>
</table>

Note: presented figures are pro forma data from one year to another, but are not restated consistently throughout all years.

\(^{(1)}\) Total net investments (as defined for each year) excluding disposals of strategic assets.

\(^{(2)}\) Aggregate of personnel expenses and other external expenses.

\(^{(3)}\) Data published with organic change at constant scope and exchange rates.
HISTORICAL FINANCIALS: DEBT

Net debt and net debt/EBITDA evolution

Debt maturity and coupon evolution

In millions of Euros

<table>
<thead>
<tr>
<th>Year</th>
<th>Net debt</th>
<th>Net debt/EBITDA</th>
<th>Average maturity of gross debt (in years)</th>
<th>Average coupon</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>33,433</td>
<td>2.1</td>
<td>8.9</td>
<td>3.80%</td>
</tr>
<tr>
<td>2014</td>
<td>34,208</td>
<td>2.0</td>
<td>13.2</td>
<td>3.29%</td>
</tr>
<tr>
<td>2015</td>
<td>37,395</td>
<td>2.1</td>
<td>13.0</td>
<td>2.92%</td>
</tr>
<tr>
<td>2016</td>
<td>37,425</td>
<td>2.3</td>
<td>13.4</td>
<td>2.73%</td>
</tr>
<tr>
<td>2017</td>
<td>33,015</td>
<td>2.4</td>
<td>13.7</td>
<td>2.95%</td>
</tr>
<tr>
<td>2018</td>
<td>33,388</td>
<td>2.2</td>
<td>13.6</td>
<td>2.87%</td>
</tr>
</tbody>
</table>
At its 15 February 2019 meeting, EDF’s Board of Directors decided to propose the payment of a €0.31 per share dividend for the 2018 fiscal year at the General shareholder’s meeting of 16 May 2019. This would correspond to a payout ratio of 50% of net income excluding non-recurring items (adjusted for the remuneration of hybrid bonds accounted for in equity).
2018: FIRST APPLICATION OF IFRS 15 ON REVENUE(1)

No significant change in the current accounting procedures, with the following exceptions:

- **Gas and electricity delivery**: the delivery component of energy supply contracts was previously included in sales revenue by all Group entities that supply electricity or gas ("principal" position). Under IFRS 15, the review of the regulatory framework and applicable contracts led to change this classification for France and Belgium ("agent" position) but to maintain it for United Kingdom and Italy. This new classification reduces at the same time revenue and purchases of delivery (included in fuel and energy purchases) by the same amount in the following sectors: France – Generation and Supply and France – Regulated activities (for gas delivery); Other international / Belgium (for gas and electricity delivery)
  - Previously, the Group’s operating segment reporting presented revenues on electricity delivery in the “France – Regulated Activities” segment, as inter-segment sales. With IFRS 15, these revenues will be presented as external sales.

- **Energy market purchases and sales as part of optimisation activities**: Contract reviews led the Group to consider that accounting for optimisation transactions on a net basis provides a more relevant reflection of their economic substance, whereas some Group entities (Edison – Italy segment, EDF Luminus – Other international segment, Dalkia – Other activities segment) have hereto reported such operations on a gross basis, recognising revenue together with energy purchases

- **Net presentation of trade receivables and progress payments received from monthly standing order payments (€6.6bn) and associated receivables and tax liabilities (€2.3bn) in the “France - Generation and Supply” segment**

---

Decrease in sales of €4.7 billion, offset by an equivalent decrease in fuel and energy purchases, with no impact on EBITDA

Implementation date within the Group: 1st January 2018, with restated 2017 data

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(1) Exact title of the standard: “Revenue from Contracts with Customers”
# IFRS 15 STANDARD: IMPACT ON REVENUE FOR 2017

## Published 2017 sales

<table>
<thead>
<tr>
<th>Sales</th>
<th>Published 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>France – Generation and supply activities</td>
<td>35,606</td>
</tr>
<tr>
<td>France – Regulated activities</td>
<td>15,896</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>8,688</td>
</tr>
<tr>
<td>Italy</td>
<td>9,940</td>
</tr>
<tr>
<td>Other International</td>
<td>4,822</td>
</tr>
<tr>
<td>Other activities</td>
<td>7,813</td>
</tr>
<tr>
<td>O/w EDF Renewables(3)</td>
<td>1,280</td>
</tr>
<tr>
<td>O/w Dalkia(3)</td>
<td>4,051</td>
</tr>
<tr>
<td>Inter-segment eliminations</td>
<td>(13,133)</td>
</tr>
<tr>
<td><strong>TOTAL Group</strong></td>
<td><strong>69,632</strong></td>
</tr>
</tbody>
</table>

## Restated 2017 sales

<table>
<thead>
<tr>
<th>Sales</th>
<th>Restated 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>France – Generation and supply activities(2)</td>
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<td>7,722</td>
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<td>Other International</td>
<td>3,166</td>
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<td>Other activities(2)</td>
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<td>O/w EDF Renewables(3)</td>
<td>1,280</td>
</tr>
<tr>
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<td>3,751</td>
</tr>
<tr>
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<td>(3,110)</td>
</tr>
<tr>
<td><strong>TOTAL Group</strong></td>
<td><strong>64,892</strong></td>
</tr>
</tbody>
</table>

---

(1) IFRS 15 standard adjustments do not represent expected impacts for 2018 nor following years. These impacts are sensitive to delivery volumes, which notably depend on weather conditions, the level of demand, delivery tariffs and optimization transactions which by nature, are very variable from one year to the other.

(2) Including impact related to sectoral changes (IFRS 8).

(3) From 01/01/2018, EDF Renewables and Dalkia represent sectors in accordance to IFRS 8 standard.
The main impacts concern financial assets held in the form of stakes in investment funds and, to a lesser extent, equity instruments (shares)

- In application of IAS 39, these assets were classified as available-for-sale financial assets and measured at fair value in the balance sheet, with changes in fair value recorded in other comprehensive income (OCI); unrealised gains and losses recognised in OCI while the asset is held were transferred to profit and loss upon its derecognition (gains/losses on available-for-sale financial assets)

- Under IFRS 9, for stakes in investment funds(1), unrealised gains or losses are recorded directly in the Group’s income statement, creating a risk of high volatility on the financial income. The impact of volatility is excluded from “Net income excluding non-recurring items”. Unrealised gains and losses as of 31 December 2017 are frozen in the retained earnings as of 1 January 2018, with no further transfer to profit and losses upon derecognition, for €1.9bn

- Based on a detailed analysis for each type of investment, the equity instruments portfolio is classified either as fair value through profit and loss (similar to stakes in investment funds), or at fair value in OCI with no further transfer of gains and losses to the income statement

- A major part (€15.9bn as of 31 December 2017) of the financial assets affected by these changes belongs to the portfolio of dedicated assets held to cover future expenses for the back-end of EDF’s nuclear cycle in France, the Group acting as a long-term investor. Gains on disposals of investments previously accounted for in the financial income, allowing to partially offset unwinding expenses of nuclear provisions covered by financial assets, are now replaced by volatile changes in fair value

Date of application by the Group: 01/01/2018, without restatement of the comparative information 2017, in accordance with the disposal of IFRS 9.

The impact of an implementation of IFRS 9, instead of IAS 39, on the Group’s results as of 31 December, 2017 is given for information purposes.

(1) Stakes in investment funds are qualified as debt instrument. Detailed analyses for each type of instrument have shown that the cash flows associated with this portfolio do not consist entirely of payments of principal and interests (“SPPI” test), contrary to standard bonds
IFRS 15 AND 9: IMPACT ON 2017 MAIN AGGREGATES

<table>
<thead>
<tr>
<th>In billions of Euros</th>
<th>2017 published</th>
<th>2017 adjusted</th>
<th>∆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>69.6</td>
<td>64.9</td>
<td>- 4.7</td>
</tr>
<tr>
<td>EBITDA</td>
<td>13.7</td>
<td>13.7</td>
<td>-</td>
</tr>
<tr>
<td>Financial income</td>
<td>-2.2</td>
<td>-2.0</td>
<td>+0.2</td>
</tr>
<tr>
<td>Net income excluding non-recurring items</td>
<td>2.8</td>
<td>2.3</td>
<td>-0.5</td>
</tr>
<tr>
<td>Net income – Group Share</td>
<td>3.2</td>
<td>3.4</td>
<td>+0.2</td>
</tr>
<tr>
<td>Equity - Group share</td>
<td>41.4</td>
<td>41.4</td>
<td>-</td>
</tr>
<tr>
<td>Net financial debt</td>
<td>33.0</td>
<td>33.0</td>
<td>-</td>
</tr>
<tr>
<td>Net financial debt / EBITDA ratio</td>
<td>2.4</td>
<td>2.4</td>
<td>-</td>
</tr>
</tbody>
</table>

Above adjustments are prived for informational purposes, and do not represent expected impacts for 2018 nor for following years:

- Concerning Revenue (IFRS 15), these figures are sensitive to delivery volumes, which notably depend on weather conditions and on demand, as well as delivery tariffs, and to optimisation transactions volume, which is by nature very variable from year to year.

- Regarding the financial result (IFRS 9), the impact calculated for the 2017 financial year amounts to +€215 million and can be explained by the non-recognition of capital gains/losses on disposals realised in 2017 (-€931 million), included in Net income excluding non-recurring items in 2017 and the recognition of changes in fair value in 2017, representing the volatility over the year, i.e. +€1,146 million, not included in Net income excluding non-recurring items.
Date applied by the Group: 1 January 2019

In accordance with IFRS 16, the Group has not restated the 2018 comparative information. See the note on the change in method for specific information

All lease contracts, with the exception of two specific exemptions (short-term lease and low-value contracts < $5,000) are recognised on the balance sheet as Right of Use (ROU) assets with a corresponding lease liability

Application of the standard leads to the recognition of impairment and financial expenses instead of lease expenses (in other external consumption in EBITDA).

The valuation of the ROU and the liability is based on fixed lease payments, taking into account the probable term of the contract (including extension/cancellation options if it is reasonably certain they will be exercised), discounted at the lessee’s marginal borrowing rate

On the transition date, the Group used the “modified retrospective” method (calculation of the liability and the asset at 01/01/2019 applying the rates on that date)

The main lease contracts relate to real-estate assets (tertiary and housing) and industrial facilities (land, wind farms) and, to a minor extent, to transport vehicles and various IT equipment
Estimated impacts at 31/12/2018:

- **Debt impact: +€4.5 billion**
  - The changes are mainly due to:
    - Renewals and new contracts: +€0.7 billion
    - Debt repayment and termination of contracts: -€0.6 billion

- **EBITDA impact: +€0.5 billion**
  - Cancellation of lease charges: +€0.7 billion
  - Cancellation of capital gains portion on the sale of real estate: -€0.2 billion

- **Impairment expenses: -€0.6 billion**

- **Financial expenses: -€0.1 billion**

- **Income before taxes: -€0.2 billion**

Reconciliation with off-balance sheet lease commitments (EHB) at 31/12/2018 with the estimated IFRS 16 liability:

EHB lease at 31/12/2018  €4.4 billion

- Exemptions from IFRS 16  - €0.1 billion
- Differences in the terms retained related to termination and extension options  +€1.1 billion
- Contracts signed in 2018 for assets available after 1 January 2019  - €0.3 billion
- Others  - €0.1 billion

Undiscounted lease debt  €5.0 billion

- Impact of discounting  - €0.5 billion

Discounted lease debt at 31/12/2018  €4.5 billion
FINANCE

- HISTORIC DATA P. 183
- 2018 RESULTS & PERSPECTIVES P. 195
- FOCUS ON CREDIT P. 218
- PROVISIONS & DEDICATED ASSETS P. 229
- CSPE P. 248
IN 2018, EDF MET OR EXCEEDED ALL OPERATIONAL AND FINANCIAL TARGETS

Significant EBITDA rebound: +11.3% org.\(^{(1)}\)
At the high end of the upgraded target range

<table>
<thead>
<tr>
<th>Performance plan rollout</th>
<th>Improved France nuclear generation</th>
<th>Strong hydro conditions and availability</th>
<th>Improved market conditions</th>
</tr>
</thead>
</table>

CASH FLOW excl. Linky, new developments & Group assets disposal plan

| Year     | Excluding interim dividend for the 2018 fiscal year | 2018 (
\(\text{€}1.1bn\)) | 2018 target\(^{(3)(4)}\) (~0) |
|----------|----------------------------------------------------|----------------------|------------------------------|

NET FINANCIAL DEBT / EBITDA

<table>
<thead>
<tr>
<th>Year</th>
<th>2018 target(^{(3)}) ≤2.5x</th>
<th>2018 (2.2x)</th>
</tr>
</thead>
</table>

NET FINANCIAL DEBT

<table>
<thead>
<tr>
<th>Year</th>
<th>31/12/2018 (\text{€33.4bn})</th>
<th>31/12/2017 (\text{€33.0bn})</th>
</tr>
</thead>
</table>

PROPOSED DIVIDEND

<table>
<thead>
<tr>
<th>Year</th>
<th>2018 (\text{€0.31/share, i.e. 50% payout}^{(5)})</th>
<th>2018 target 50% payout(^{(5)})</th>
</tr>
</thead>
</table>

\(^{(1)}\) Organic change at comparable scope and exchange rates
\(^{(2)}\) Excluding Linky, new developments & Group assets disposal plan.
\(^{(3)}\) At comparable exchange rates. At “normal” weather conditions. On the basis of a >395TWh France nuclear output assumption At constant pensions discount rate.
\(^{(4)}\) Excluding interim dividend for the 2018 fiscal year
\(^{(5)}\) Payout ratio based on Net income excluding non-recurring items, adjusted for the remuneration of hybrid bonds accounted for in equity
PERFORMANCE PLAN DELIVERED BEYOND TARGETS

2018

**OPEX**<sup>(1)</sup> REDUCTION

€0.96bn vs 2015

→ €0.8bn target exceeded

**WORKING CAPITAL REQUIREMENT**

Down €2.1bn over 2015-2018

→ €1.8bn target exceeded

**GROUP ASSETS DISPOSAL PLAN**

~€10bn<sup>(2)</sup> completed

→ 2 years ahead of the 2020 milestone

**TOTAL NET INVESTMENTS**<sup>(3)</sup>

€14bn

→ Within the €15bn guidance

---

(1) Sum of personal expenses and other external expenses. At constant scope, exchange rates and pension discount rate. Excluding change in operating expenses of service activities
(2) Impact on net financial debt. Cumulative impact since 2015.
(3) Total net investments excluding Group assets disposal plan
PERFORMANCE PLAN – €10 BILLION\(^{(1)}\) DISPOSALS OVER 2015-2018 TO DELEVERAGE AND FOCUS ON CORE BUSINESS

<table>
<thead>
<tr>
<th>NON CONTROLLED ASSETS</th>
<th>€4.3bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 49.9% of CTE (2017)</td>
<td></td>
</tr>
<tr>
<td>• Minority participation in Estag (2015)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NON CORE MARKETS AND CO(_2) INTENSIVE BUSINESSES</th>
<th>€1.6bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• EDF Polska (2017)</td>
<td></td>
</tr>
<tr>
<td>• Bert (2015) and Demasz in Hungary (2017)</td>
<td></td>
</tr>
<tr>
<td>• Fossil-fuel assets of EDF Trading (2015, 2017 and 2018)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REAL ESTATE ASSETS</th>
<th>€1.6bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• EDF Group headquarters (2015-16) and Edison headquarters (2017)</td>
<td></td>
</tr>
<tr>
<td>• SOFILO’s portfolio of office and business assets (3 tranches 2015-18)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GAS INFRASTRUCTURE ASSETS</th>
<th>€1.7bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Edison’s gas infrastructure assets (2017)</td>
<td></td>
</tr>
<tr>
<td>• Dunkirk LNG terminal (2018)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
<th>€0.8bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sale to CGN of a 33.5% stake in Hinkley Point C(^{(2)}) (2016)</td>
<td></td>
</tr>
</tbody>
</table>

\(1\) Impact on net financial debt  
\(2\) Stake in NNB Holding Company (HPC) Limited
## CUSTOMERS AND SERVICES: STRONG RESILIENCE ON ALL MARKETS AGAINST A BACKDROP OF INCREASING COMPETITION

<table>
<thead>
<tr>
<th>CUSTOMERS FRANCE</th>
<th>A STRONGER MARKETING OFFENSIVE</th>
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<tr>
<td><strong>CUSTOMERS EUROPE</strong></td>
<td>EUROPE: CONTRASTING CONDITIONS DEPENDING ON COUNTRIES</td>
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<tr>
<td><strong>SERVICES</strong></td>
<td>ACCELERATION OF B2C SERVICES STRENGTHENING OF SUBSIDIARIES</td>
</tr>
<tr>
<td><strong>ELECTRIC MOBILITY</strong></td>
<td>LAUNCH OF EDF’S ELECTRIC MOBILITY PLAN</td>
</tr>
</tbody>
</table>

### CUSTOMERS FRANCE

**A STRONGER MARKETING OFFENSIVE**

- Estimated market share of 82% B2C and 61% B2B
- **Broader range of offerings:**
  - “Vert Electrique”: 210 000 customers already
  - **DIGIWATT**, a 100% on-line offering
  - “Mon chauffage durable”: Replacement of oil heating systems with heat pumps made easier
  - “Mon soleil & moi”: 4600 customers, sales doubled in 2018

### CUSTOMERS EUROPE

**EUROPE: CONTRASTING CONDITIONS DEPENDING ON COUNTRIES**

- **Italy:** Completed acquisition of a portfolio of 500 000 Naturgy customers
- **Belgium:** Stronger position on the business market; contract signed by Citelum to modernise lighting systems on Walloon motorways
- **United Kingdom:** New offerings in “smart home”, energy storage and energy flexibility

### SERVICES

**ACCELERATION OF B2C SERVICES STRENGTHENING OF SUBSIDIARIES**

- Launch of "IZI by EDF", the very first services platform for residential customers and businesses
- **Dalkia:** new contracts for heating systems (Perpignan, Rouen-Bihorel); acquisition of Aegis Energy Services in the United States
- **Edison:** acquisition of Zephyro in Italy

### ELECTRIC MOBILITY

**LAUNCH OF EDF’S ELECTRIC MOBILITY PLAN**

- **Initial achievements with Izivia:** deployment of 600 charging points in Lyon; extension and operation of 500 charging points in Nice Métropole (Greater Nice Area)

* Formerly “Gas Natural Fenosa”
# RENEWABLES: STRONG GROWTH MOMENTUM

## RENEWABLE POWER GENERATION

### 2018, A RECORD YEAR
- France’s highest hydro output in 15 years: +25.4%
- Record-high renewable output achieved by the Group (excl. hydro): +14%

## COMMISSIONING AND CONSTRUCTION PROJECTS

### ESTABLISHING A BALANCE BETWEEN WIND AND SOLAR TECHNOLOGIES
- 1.6 GW of gross capacity commissioned by EDF Renewables and **for the first time ever, more solar than wind**
- Gross portfolio of EDF Renewables projects under construction: 2.4GW (+21%) **equally split between solar and wind power**

## PROJECTS UNDER DEVELOPMENT

### STEPPING UP THE PACE IN THE WIND-POWER SECTOR, INCLUDING OFF-SHORE
- **United Kingdom**: Acquisition of the off-shore Neart na Gaoithe wind project, currently under development (450 MW)
- **United States**: Acquisition of a lease to develop off-shore wind projects along the New Jersey coast
- **Saudi Arabia**: Contract awarded for the most powerful wind facility in the Middle East (400 MW)

## EDF SOLAR PLAN

### MAJOR PROGRESS
- **EDF Renewables in exclusive negotiations for the acquisition of the Luxel Group**: 1 GW of capacity in France including projects ready for construction or under development, as well as 90 MWp in operation.

## ELECTRICITY STORAGE

### LAUNCH OF EDF’S ELECTRICITY STORAGE PLAN
- **Ambition**: Becoming Europe’s leader in the sector by 2035; 10 GW of new global storage capacity.
- Power purchase agreement awarded for the **Big Beau Solar** project (128 MWp of solar energy and 40 MW of battery storage) in the United States.
FRANCE: STRONG OPERATING PERFORMANCE

EXISTING NUCLEAR CAPACITY

• Output in line with projections: 393.2 TWh
• Nuclear safety: Number of automatic reactor trips at a record low

SUCCESSFUL INTEGRATION

FRAMATOME

• €3 billion worth of orders placed
• Contract renewed with China Nuclear Energy Industry Corp. for the supply of fuel-assembly components
• Steam-generator maintenance contract signed with Dominion Energy (USA)

NUMEROUS COMMERCIAL ACHIEVEMENTS

COMMISSIONING OF EPR TECHNOLOGY

NEW NUCLEAR

• Commissioning of the world’s first EPR at the Taishan site in China
• Hinkley Point C: all 2018 milestones successfully cleared, design finalised, pouring of first common-raft concrete for reactor no. 1
• Flamanville 3: Continued implementation of the the action plan on welds of the main secondary system announced on 25 July 2018. The "hot tests" are scheduled to commence during the second half of February.
• Jaitapur: Comprehensive initial bid submitted by EDF to NPCIL in December 2018

FORGING AHEAD WITH PROJECTS UNDER DEVELOPMENT

CUSTOMER FOCUS

LOW-CARBON GENERATION

INTERNATIONAL DEVELOPMENT

CUSTOMER FOCUS

LOW-CARBON
GENERATION

INTERNATIONAL
DEVELOPMENT
INTERNATIONAL BUSINESS: EDF STRENGTHENS ITS FOOTHOLD OUTSIDE OF EUROPE

AFRICA

EDF GAINS A SIGNIFICANTLY STRONGER FOOTHOLD

- Construction begins on the Nachtigal dam in the Cameroon: 420 MW, 30% of the country’s power output; winner of the “Global multilateral deal of the year” prize, awarded by PFI*
- Expansion of the Off-Grid package and its extension to three more countries: Ghana, Togo, Kenya. Already a total of 72 000 off-grid customers in Africa.
- Acquisition of interests in service companies: Conergies (Côte d’Ivoire) and Gibb Power (South Africa)

SOUTH AMERICA

MAJOR PROGRESS IN KEY COUNTRIES

- Construction of the Sinop dam in Brazil completed (400 MW)
- Citelum strengthens its foothold in Chile (13% of market share) with new relamping contracts in Independencia and Santiago (Chile)

ASIA

STEPPING UP THE PACE OF PROJECT DEVELOPMENT

- China: First set of energy-service contracts for the Lingbao and Sanya municipalities
- Projects being developed in Vietnam (combined-cycle) and Myanmar (hydro)
- Singapore: Commissioning of the first Microgrid demonstrator (Masera)

*Magazine Project Finance International
# 2018 RESULTS: SIMPLIFIED INCOME STATEMENTS

<table>
<thead>
<tr>
<th></th>
<th>2017(1)</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>64,892</td>
<td>68,976</td>
</tr>
<tr>
<td>Fuel and energy purchases</td>
<td>(32,901)</td>
<td>(33,012)</td>
</tr>
<tr>
<td>Other external expenses</td>
<td>(8,739)</td>
<td>(9,364)</td>
</tr>
<tr>
<td>Personnel expenses</td>
<td>(12,456)</td>
<td>(13,690)</td>
</tr>
<tr>
<td>Taxes other than income taxes</td>
<td>(3,541)</td>
<td>(3,697)</td>
</tr>
<tr>
<td>Other operating income and expenses</td>
<td>6,487</td>
<td>6,052</td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>13,742</td>
<td>15,265</td>
</tr>
<tr>
<td>Impact of the commodities volatility</td>
<td>(355)</td>
<td>(224)</td>
</tr>
<tr>
<td>Net depreciation and amortisation</td>
<td>(8,537)</td>
<td>(9,006)</td>
</tr>
<tr>
<td>Net increases in provisions for renewal of property, plant and equipment operated under concessions</td>
<td>(58)</td>
<td>(50)</td>
</tr>
<tr>
<td>(Impairment)/reversals</td>
<td>(518)</td>
<td>(598)</td>
</tr>
<tr>
<td>Other income and expenses</td>
<td>1,363</td>
<td>(105)</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>5,637</td>
<td>5,282</td>
</tr>
<tr>
<td>Financial income</td>
<td>(2,236)</td>
<td>(4,809)</td>
</tr>
<tr>
<td><strong>Income before taxes of consolidated companies</strong></td>
<td>3,401</td>
<td>473</td>
</tr>
<tr>
<td><strong>Net income – Group share</strong></td>
<td>3,173</td>
<td>1,177</td>
</tr>
<tr>
<td><strong>Net income excl. non-recurring items(2)</strong></td>
<td>2,820</td>
<td>2,452</td>
</tr>
</tbody>
</table>

---

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15 and from the change in sectoral information (IFRS 8). For IFRS 9, applicable from 1 January 2018, the transition provisions do not require restatement and the comparative figures are therefore as previously published.

(2) Excluding non-recurring items, net changes in the fair value of energy and commodity derivatives (excluding trading activities), and net changes in the fair value of debt and equity instruments, net of tax.
## 2018 RESULTS: CHANGE IN SALES\(^{(1)}\)

<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>2017(^{(2)})</th>
<th>Forex</th>
<th>Scope</th>
<th>Organic growth</th>
<th>2018</th>
<th>Δ% org.(^{(3)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>France – Generation and supply activities</td>
<td>25,084</td>
<td>-</td>
<td>-</td>
<td>1,012</td>
<td>26,096</td>
<td>+4.0</td>
</tr>
<tr>
<td>France – Regulated activities(^{(4)})</td>
<td>15,836</td>
<td>-</td>
<td>-</td>
<td>212</td>
<td>16,048</td>
<td>+1.3</td>
</tr>
<tr>
<td>Framatome</td>
<td>-</td>
<td>-</td>
<td>3,313</td>
<td>-</td>
<td>3,313</td>
<td>n/a</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>8,688</td>
<td>(82)</td>
<td>27</td>
<td>337</td>
<td>8,970</td>
<td>-3.9</td>
</tr>
<tr>
<td>Italy</td>
<td>7,722</td>
<td>-</td>
<td>307</td>
<td>478</td>
<td>8,507</td>
<td>+6.2</td>
</tr>
<tr>
<td>Other international</td>
<td>3,166</td>
<td>(81)</td>
<td>(783)</td>
<td>109</td>
<td>2,411</td>
<td>+3.4</td>
</tr>
<tr>
<td>EDF Renewables</td>
<td>1,280</td>
<td>(29)</td>
<td>147</td>
<td>107</td>
<td>1,505</td>
<td>+8.4</td>
</tr>
<tr>
<td>Dalkia</td>
<td>3,751</td>
<td>(4)</td>
<td>123</td>
<td>319</td>
<td>4,189</td>
<td>+8.5</td>
</tr>
<tr>
<td>Other activities</td>
<td>2,475</td>
<td>(7)</td>
<td>3</td>
<td>130</td>
<td>2,601</td>
<td>+5.3</td>
</tr>
<tr>
<td>Inter-segment eliminations</td>
<td>(3,110)</td>
<td>-</td>
<td>(1,424)(^{(5)})</td>
<td>(130)</td>
<td>(4,664)</td>
<td>+4.2</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td><strong>64,892</strong></td>
<td><strong>(203)</strong></td>
<td><strong>1,713</strong></td>
<td><strong>2,574</strong></td>
<td><strong>68,976</strong></td>
<td><strong>+4.0</strong></td>
</tr>
</tbody>
</table>

(1) Breakdown of sales across the segments, before inter-segment eliminations  
(2) The comparative figures at 31 December 2017 have been restated according to IFRS 15 and from the change in sectoral information (IFRS 8)  
(3) Organic change at constant scope and exchange rates  
(4) Regulated activities: Enedis, ÉS and island activities; Enedis, an independant EDF subsidiary as defined in the French energy code  
(5) Including €(1,409)m of inter-segment eliminations relating to the integration of Framatome
## CHANGE IN EBITDA\(^{(1)}\)

<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>2017(^{(2)})</th>
<th>Forex</th>
<th>Scope</th>
<th>Organic growth</th>
<th>2018</th>
<th>Δ% org.(^{(3)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>France – Generation and supply activities</td>
<td>4,896</td>
<td>-</td>
<td>-</td>
<td>1,431</td>
<td>6,327</td>
<td>+29.2</td>
</tr>
<tr>
<td>France – Regulated activities</td>
<td>4,898</td>
<td>-</td>
<td>-</td>
<td>18</td>
<td>4,916</td>
<td>+0.4</td>
</tr>
<tr>
<td>Framatome</td>
<td>-</td>
<td>-</td>
<td>202</td>
<td>-</td>
<td>202</td>
<td>Na</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1,035</td>
<td>(10)</td>
<td>(83)</td>
<td>(159)</td>
<td>783</td>
<td>-15.4</td>
</tr>
<tr>
<td>Italy</td>
<td>910</td>
<td>-</td>
<td>(3)</td>
<td>(116)</td>
<td>791</td>
<td>-12.7</td>
</tr>
<tr>
<td>Other international</td>
<td>457</td>
<td>(26)</td>
<td>(177)</td>
<td>(14)</td>
<td>240</td>
<td>-3.1</td>
</tr>
<tr>
<td>EDF Renewables</td>
<td>751</td>
<td>(21)</td>
<td>95</td>
<td>31</td>
<td>856</td>
<td>+4.1</td>
</tr>
<tr>
<td>Dalkia</td>
<td>259</td>
<td>-</td>
<td>2</td>
<td>31</td>
<td>292</td>
<td>+12.0</td>
</tr>
<tr>
<td>Other activities</td>
<td>536</td>
<td>(1)</td>
<td>(10)</td>
<td>333</td>
<td>858</td>
<td>+62.1</td>
</tr>
<tr>
<td><strong>Total Group</strong></td>
<td><strong>13,742</strong></td>
<td><strong>(58)</strong></td>
<td><strong>26</strong></td>
<td><strong>1,555</strong></td>
<td><strong>15,265</strong></td>
<td><strong>+11.3</strong></td>
</tr>
</tbody>
</table>

\(^{(1)}\) Contribution to the group  
\(^{(2)}\) Data as at 31 December 2017 restated for the change in sectoral information (IFRS 8)  
\(^{(3)}\) Organic change at constant scope and exchange rates
Regulated activities: Enedis, ÉS and island activities; Enedis, an independent EDF subsidiary as defined in the French energy code.
## CHANGE IN OPEX\(^{(1)}\)

<table>
<thead>
<tr>
<th>En millions d’euros</th>
<th>2017(^{(2)})</th>
<th>2018</th>
<th>Δ</th>
<th>Δ %</th>
</tr>
</thead>
<tbody>
<tr>
<td>France – Generation and supply activities</td>
<td>9,230</td>
<td>8,887</td>
<td>-343</td>
<td>-3.7</td>
</tr>
<tr>
<td>France – Regulated activities</td>
<td>4,972</td>
<td>4,905</td>
<td>-67</td>
<td>-1.3</td>
</tr>
<tr>
<td>Framatome</td>
<td>-</td>
<td>1,774</td>
<td>+1,774</td>
<td>n/a</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2,035</td>
<td>2,097</td>
<td>+62</td>
<td>+3.0</td>
</tr>
<tr>
<td>Italy</td>
<td>876</td>
<td>982</td>
<td>+106</td>
<td>+12.1</td>
</tr>
<tr>
<td>Other international</td>
<td>702</td>
<td>588</td>
<td>-114</td>
<td>-16.2</td>
</tr>
<tr>
<td>EDF Renewables</td>
<td>777</td>
<td>915</td>
<td>+138</td>
<td>+17.8</td>
</tr>
<tr>
<td>Dalkia</td>
<td>2,227</td>
<td>2,491</td>
<td>+264</td>
<td>+11.9</td>
</tr>
<tr>
<td>Other activities</td>
<td>376</td>
<td>415</td>
<td>+39</td>
<td>+10.4</td>
</tr>
<tr>
<td><strong>Total Groupe</strong></td>
<td><strong>21,195</strong></td>
<td><strong>23,054</strong></td>
<td><strong>+1,859</strong></td>
<td><strong>+8.8</strong></td>
</tr>
</tbody>
</table>

\(^{(1)}\) Opex (operational expenses) corresponding to the sum of personnel expenses and other external expenses after inter-segment eliminations

\(^{(2)}\) Data as at 31 December 2017 restated from the change in sectoral information (IFRS 8)

\(^{(3)}\) Data at 2018 scope and exchange rates. At 2018 pensions discount rate. Excluding change in operating expenses of service activities

### Performance plan

<table>
<thead>
<tr>
<th>Δ</th>
<th>Δ 2015/2016(^{(3)})</th>
<th>Δ 2016/2017(^{(3)})</th>
<th>Δ 2017/2018(^{(3)})</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>-101</td>
<td>-488</td>
<td>-313</td>
<td>-902</td>
<td></td>
</tr>
<tr>
<td>-19</td>
<td>+3</td>
<td>-38</td>
<td>-54</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>-87</td>
<td>+23</td>
<td>-2</td>
<td>-66</td>
<td></td>
</tr>
<tr>
<td>-44</td>
<td>-37</td>
<td>+24</td>
<td>-57</td>
<td></td>
</tr>
<tr>
<td>+7</td>
<td>-21</td>
<td>-18</td>
<td>-32</td>
<td></td>
</tr>
<tr>
<td>+27</td>
<td>+58</td>
<td>+49</td>
<td>+134</td>
<td></td>
</tr>
<tr>
<td>-56</td>
<td>+53</td>
<td>-16</td>
<td>-19</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>-22</td>
<td>+58</td>
<td>+34</td>
<td></td>
</tr>
<tr>
<td>-275</td>
<td>-431</td>
<td>-256</td>
<td>-962</td>
<td></td>
</tr>
</tbody>
</table>
PERFORMANCE PLAN
REDUCTION IN OPERATIONAL EXPENSES (1)

Cumulative reductions (1) achieved vs. 2015 base: €962m at end-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Personnel expenses</th>
<th>Purchases</th>
<th>Total Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>€275</td>
<td>1,481</td>
<td>€1,756</td>
</tr>
<tr>
<td>2017</td>
<td>€706</td>
<td>1,411</td>
<td>€2,117</td>
</tr>
<tr>
<td>2018</td>
<td>€962</td>
<td>1,590</td>
<td>€2,552</td>
</tr>
<tr>
<td>2019 target</td>
<td>€1,100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Breakdown of cumulative reductions (1)

- Personnel expenses: 10%
- Purchases: 90%

2018 target of €0.8bn (1) exceeded - Well on track to delivering the 2019 target

(1) Sum of personal expenses and other external expenses. At constant scope, exchange rates and pension discount rate. Excluding change in operating expenses of service activities.

FINANCE 2018 RESULTS & PERSPECTIVES
## 2018 RESULTS: CHANGE IN NET INCOME

<table>
<thead>
<tr>
<th>Description</th>
<th>2017(^{(1)})</th>
<th>2018</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before taxes of consolidated companies</td>
<td>3,401</td>
<td>473</td>
<td>(2,928)</td>
</tr>
<tr>
<td>Income tax</td>
<td>(147)</td>
<td>149</td>
<td>296</td>
</tr>
<tr>
<td>Share in income of associates and joint ventures</td>
<td>35</td>
<td>569</td>
<td>534</td>
</tr>
<tr>
<td>Deducting net income from minority interests</td>
<td>116</td>
<td>14</td>
<td>(102)</td>
</tr>
<tr>
<td><strong>Net income – Group Share</strong></td>
<td>3,173</td>
<td>1,177</td>
<td>(1,996)</td>
</tr>
<tr>
<td>Neutralisation of non-recurring items including commodities volatility</td>
<td>(353)</td>
<td>1,275</td>
<td>1,628</td>
</tr>
<tr>
<td><strong>Net income excl. non-recurring items</strong></td>
<td>2,820</td>
<td>2,452</td>
<td>(368)</td>
</tr>
</tbody>
</table>

\(^{(1)}\) The comparative figures at 31 December 2017 have been restated according to IFRS 15. For IFRS 9, applicable from 1 January 2018, the transition provisions do not require restatement and the comparative figures are therefore as previously published.
## 2018 RESULTS: SIMPLIFIED BALANCE SHEET OF THE EDF GROUP

### ASSETS

<table>
<thead>
<tr>
<th>(In millions of Euros)</th>
<th>31/12/2017(1)</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intangible and tangible assets</td>
<td>156,900</td>
<td>162,219</td>
</tr>
<tr>
<td>Other non-current assets</td>
<td>47,424</td>
<td>48,165</td>
</tr>
<tr>
<td><strong>Non-current assets</strong></td>
<td><strong>204,324</strong></td>
<td><strong>210,384</strong></td>
</tr>
<tr>
<td>Inventories and trade receivables</td>
<td>30,981</td>
<td>30,137</td>
</tr>
<tr>
<td>Other current assets</td>
<td>32,845</td>
<td>39,358</td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>3,692</td>
<td>3,290</td>
</tr>
<tr>
<td><strong>Current assets</strong></td>
<td><strong>67,518</strong></td>
<td><strong>72,785</strong></td>
</tr>
<tr>
<td>Assets held for sale</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td><strong>271,842</strong></td>
<td><strong>283,169</strong></td>
</tr>
</tbody>
</table>

(1) The comparative figures at 31 December 2017 have been restated according to IFRS 15.

### LIABILITIES

<table>
<thead>
<tr>
<th>(In millions of Euros)</th>
<th>31/12/2017(1)</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity (EDF’s share)</td>
<td>41,357</td>
<td>44,469</td>
</tr>
<tr>
<td>Equity (non-controlling interests)</td>
<td>7,341</td>
<td>8,177</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td><strong>48,698</strong></td>
<td><strong>52,646</strong></td>
</tr>
<tr>
<td>Non-current provisions</td>
<td>71,373</td>
<td>71,772</td>
</tr>
<tr>
<td>Special concession assets</td>
<td>46,323</td>
<td>46,924</td>
</tr>
<tr>
<td>Non-current other liabilities</td>
<td>58,591</td>
<td>59,012</td>
</tr>
<tr>
<td><strong>Non current liabilities</strong></td>
<td><strong>176,287</strong></td>
<td><strong>177,708</strong></td>
</tr>
<tr>
<td>Current liabilities</td>
<td>46,857</td>
<td>52,815</td>
</tr>
<tr>
<td>Liabilities related to assets classified as held for sale</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td><strong>271,842</strong></td>
<td><strong>283,169</strong></td>
</tr>
</tbody>
</table>
## 2018 RESULTS: CHANGE IN CASH FLOW (1/2)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In €m</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>13,742</td>
<td>15,265</td>
</tr>
<tr>
<td>Non cash items</td>
<td>(1,796)</td>
<td>(1,253)</td>
</tr>
<tr>
<td>Net financial expenses disbursed</td>
<td>(1,209)</td>
<td>(1,062)</td>
</tr>
<tr>
<td>Income tax paid</td>
<td>(771)</td>
<td>(389)</td>
</tr>
<tr>
<td>Other items o/w dividends received from associates and joint-ventures</td>
<td>221</td>
<td>383</td>
</tr>
<tr>
<td><strong>Operating cash flow</strong></td>
<td>10,187</td>
<td>12,944</td>
</tr>
<tr>
<td>( \Delta ) WCR</td>
<td>1,476</td>
<td>462</td>
</tr>
<tr>
<td>Total net investments and acquisitions excluding Group assets disposal plan</td>
<td>(16,003)</td>
<td>(14,044)</td>
</tr>
<tr>
<td>( o/w: ) Net investments excluding Linky(^{(1)}), new developments and Group assets disposal plan</td>
<td>(11,968)</td>
<td>(10,935)</td>
</tr>
<tr>
<td>Linky(^{(1)}) and new developments(^{(2)})</td>
<td>(4,035)</td>
<td>(3,109)</td>
</tr>
<tr>
<td>Group assets disposal plan</td>
<td>6,193</td>
<td>1,937</td>
</tr>
<tr>
<td><strong>Cash flow after net investments and WCR change</strong></td>
<td><strong>1,853</strong></td>
<td><strong>1,299</strong></td>
</tr>
</tbody>
</table>

---

(1) Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code
(2) New developments: in particular UK NNB projects, offshore wind and major acquisition (including the acquisition of Framatome (€1,868m) in 2017 and GNVI in 2018)
Mainly regulatory allocation of €1,095m in compliance with ministerial letter of 10 February 2017

Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code

New developments: in particular UK NNB projects, offshore wind and major acquisition (including the acquisition GNVI in 2018)

### 2018 RESULTS: CHANGE IN CASH FLOW (2/2)

<table>
<thead>
<tr>
<th>In €m</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flow after net investments and WCR change</td>
<td>1,853</td>
<td>1,299</td>
</tr>
<tr>
<td>Dedicated assets</td>
<td>(1,171)(1)</td>
<td>(501)</td>
</tr>
<tr>
<td>Cash flow before dividends</td>
<td>682</td>
<td>798</td>
</tr>
<tr>
<td>Dividends paid in cash</td>
<td>(326)</td>
<td>(694)</td>
</tr>
<tr>
<td>Interest payments on hybrid issues</td>
<td>(565)</td>
<td>(584)</td>
</tr>
<tr>
<td>Group cash flow</td>
<td>(209)</td>
<td>(480)</td>
</tr>
</tbody>
</table>

### Cash flow Guidance

<table>
<thead>
<tr>
<th>In €m</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group cash flow</td>
<td>(480)</td>
</tr>
<tr>
<td>Linky(2) and new developments(3)</td>
<td>3,109</td>
</tr>
<tr>
<td>Group assets disposal plan</td>
<td>(1,937)</td>
</tr>
<tr>
<td>2018 interim dividend and other</td>
<td>433</td>
</tr>
<tr>
<td><strong>Cash flow excluding Linky, new developments and Group assets disposal plan</strong></td>
<td>1,125</td>
</tr>
</tbody>
</table>

(1) Mainly regulatory allocation of €1,095m in compliance with ministerial letter of 10 February 2017
(2) Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code
(3) New developments: in particular UK NNB projects, offshore wind and major acquisition (including the acquisition GNVI in 2018)
2018 RESULTS: TOTAL NET INVESTMENTS AND ACQUISITIONS EXCLUDING GROUP ASSETS DISPOSAL PLAN

In €m

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Net Investments and Acquisitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>€16,003</td>
</tr>
<tr>
<td>2018</td>
<td>€14,044</td>
</tr>
</tbody>
</table>

Investments\(^{(1)}\): -€1,033m

- Framatome\(^{(2)}\): -€1,868
- Regulated activities France: +€133
- Nuclear: -€369
- Other: -€583

New developments: +€943m

- Renewables & Services: +€71
- Linky: +€180
- New Nuclear: +€423
- Other: +€411

NB: figures rounded up to the nearest whole number

(1) Net investments excluding Linky, new developments and Group assets disposal plan
(2) Corresponding to the acquisition of Framatome on 31/12/2017 (excl. acquisition costs)
INVESTMENTS: FROM GROSS TO NET\(^{(1)}\)

<table>
<thead>
<tr>
<th>Description</th>
<th>Gross Investments</th>
<th>Net Investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross operating investments</td>
<td>16,186</td>
<td>14,044</td>
</tr>
<tr>
<td>Gross financial investments</td>
<td>+847</td>
<td></td>
</tr>
<tr>
<td>Disposals (excluding Group plan 2015-2020)</td>
<td>-1,264</td>
<td></td>
</tr>
<tr>
<td>Grants and participations</td>
<td>-1,225</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>-500</td>
<td></td>
</tr>
</tbody>
</table>

In millions of Euros

(1) Net investments including Linky, new developments and assets disposals
NET TOTAL INVESTMENTS INCLUDING ACQUISITIONS, EXCLUDING 2015-2020 DISPOSAL PLAN

2017

- France – Generation and supply activities: 38%
- France – Regulated activities: 24%
- United Kingdom: 13%
- Italy: 3%
- Other international: 3%
- Dalkia: 2%
- Framatome(1): 12%

2018

- France – Generation and supply activities: 38%
- France – Regulated activities: 29%
- United Kingdom: 16%
- Italy: 6%
- Other international: 3%
- Dalkia: 2%
- Framatome: 2%

(1) Corresponding to the acquisition of Framatome on 31/12/2017 (excl. acquisition costs)
### NET INVESTMENTS INCLUDING ACQUISITIONS EXCLUDING 2015-2020 DISPOSAL PLAN

In billions of Euros

<table>
<thead>
<tr>
<th>2017(1)</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>€16.0bn</strong></td>
<td><strong>€14.0bn</strong></td>
</tr>
<tr>
<td>Renewables</td>
<td>0.6</td>
</tr>
<tr>
<td>Grand Carénage (nuclear maintenance France)</td>
<td>1.2</td>
</tr>
<tr>
<td>Enedis, SEI &amp; ES</td>
<td>0.9</td>
</tr>
<tr>
<td>Linky</td>
<td>0.2</td>
</tr>
<tr>
<td>UK NNB</td>
<td>0.6</td>
</tr>
<tr>
<td>Framatome</td>
<td>3.9</td>
</tr>
<tr>
<td>New developments in renewables &amp; services</td>
<td>1.8</td>
</tr>
<tr>
<td>Flamanville 3</td>
<td>-</td>
</tr>
<tr>
<td>Services</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>7.6</td>
</tr>
</tbody>
</table>

#### 2018 figures

<table>
<thead>
<tr>
<th>In billions of Euros</th>
<th>Maintenance</th>
<th>Development</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewables</td>
<td>0.4</td>
<td>0.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Grand Carénage</td>
<td>3.9</td>
<td>-</td>
<td>3.9</td>
</tr>
<tr>
<td>Enedis, SEI &amp; ES</td>
<td>1.8</td>
<td>1.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Linky</td>
<td>-</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>UK NNB</td>
<td>-</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Framatome</td>
<td>0.2</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>New developments in renewables &amp; services</td>
<td>-</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Flamanville 3</td>
<td>-</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Services</td>
<td>0.4</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>0.9</td>
<td>0.7</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>7.6</td>
<td>6.4</td>
<td>14.0</td>
</tr>
</tbody>
</table>

**NB:** figures rounded up to the nearest whole number
(1) 2017 figures slightly adjusted due to a change in the categorization of investments
(2) Mainly Italy, United Kingdom and Taishan

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**FINANCE 2018 RESULTS & PERSPECTIVES**

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2019 GUIDANCE AND MEDIUM TERM OUTLOOK\(^{(1)}\) – IFRS 16 IMPACT

**2019 TARGETS**

- **EBITDA\(^{(2)}\)**
- **DECREASE IN OPEX\(^{(3)}\)**
- **CASH FLOW excluding HPC and Linky**
- **TOTAL NET INVESTMENTS\(^{(4)}\)**
  - excluding acquisitions and “2019-2020 Group disposals”
- **2019-2020 GROUP DISPOSALS**

**2019-20 AMBITIONS**

- **NET FINANCIAL DEBT / EBITDA\(^{(2)}\)**
- **DIVIDEND**
  - Payout ratio based on Net income
  - Excluding non-recurring items\(^{(5)}\)
  - French State committed to scrip for the balance of the 2018 dividend and dividends relating to FY2019 and FY2020

---

Before IFRS 16 application

- **€15.3 - €16.0bn**
- ~€1.1 bn vs 2015
- >0
- ~€15bn / year
- €2bn to €3bn
- ≤2.5x
- 45 - 50%

Impact of IFRS 16 application

- [+€700m](#)
- [+€640m\(^{(6)}\)](#)
- [+ ~0.2x\(^{(7)}\)](#)

---

**FINANCE 2018 RESULTS & PERSPECTIVES**

\(^{(1)}\) At constant legal and regulatory framework in France.

\(^{(2)}\) On the basis of the scope and exchange rates at 01/01/2019 and of an assumption of a 395TWh France nuclear output.

\(^{(3)}\) At prevailing price conditions beginning of February 2019 (around €50 per MWh) for the unhedged 2020 France volumes.

\(^{(4)}\) Sum of personnel expenses and other external expenses. At comparable scope and exchange rates. At constant pension discount rates. Excluding change in operating expenses of service activities

\(^{(5)}\) Adjusted for the remuneration of hybrid bonds accounted for in equity

\(^{(6)}\) The impact of IFRS 16 application on cash-flow is derived from the increase in EBITDA (no more rental costs) and from the recognition of financial interests paid on the IFRS 16 net financial debt. This additional cash-flow, mechanical effect of IFRS 16 application, is allocated to the repayment of principal of IFRS 16 net financial debt.

\(^{(7)}\) This impact includes the increase of EBITDA on one hand and the recognition of the IFRS net financial debt on the other hand.
FINANCE

- HISTORIC DATA P. 183
- 2018 RESULTS & PERSPECTIVES P. 195
- FOCUS ON CREDIT P. 218
- PROVISIONS & DEDICATED ASSETS P. 229
- CSPE P. 248
## Debt and Liquidity

<table>
<thead>
<tr>
<th></th>
<th>31/12/2016</th>
<th>31/12/2017</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net financial debt</strong></td>
<td>37.4</td>
<td>33.0</td>
<td>33.4</td>
</tr>
<tr>
<td><strong>Net financial debt/EBITDA</strong></td>
<td>2.3x</td>
<td>2.4x</td>
<td>2.2x</td>
</tr>
</tbody>
</table>

### Debt
- **Bonds**
  - 31/12/2016: 51.9
  - 31/12/2017: 47.3
  - 31/12/2018: 50.4
- **Average maturity of gross debt (in years)**
  - 31/12/2016: 13.4
  - 31/12/2017: 13.7
  - 31/12/2018: 13.6
- **Average coupon**
  - 31/12/2016: 2.73%
  - 31/12/2017: 2.95%
  - 31/12/2018: 2.87%

### Gross liquidity

<table>
<thead>
<tr>
<th></th>
<th>31/12/2016</th>
<th>31/12/2017</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross liquidity</strong> (1)</td>
<td>36.9</td>
<td>34.6</td>
<td>35.2</td>
</tr>
</tbody>
</table>

(1) With cash and cash equivalents, Available-for-sale financial assets (liquid assets), and undrawn line of credit.
NET FINANCIAL DEBT (1/2)

In €bn

December 2017

(33.0)

+12.9

Operating cash flow

-11.0

Net investments\(^{(1)}\)

-3.1

Linky\(^{(2)}\) & new developments

+1.9

2018 contribution to 2015-2020 disposal plan

-1.3

Dividends\(^{(3)}\)

-0.5

Dedicated assets

+0.2

Other

\[\Delta \text{ WCR}\]

December 2018

(33.4)

Net financial debt kept stable

NB: figures rounded up to the nearest whole number

(1) Net investments excluding Linky, new developments and 2015-2020 assets disposal plan

(2) Linky is a project led by Enedis, independent subsidiary of EDF under the provisions of the French energy code

(3) Dividends including hybrid bonds remuneration
# NET FINANCIAL DEBT (2/2)

<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>31/12/2016</th>
<th>31/12/2017</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial debt</td>
<td>65,195</td>
<td>56,846</td>
<td>59,188</td>
</tr>
<tr>
<td>Derivatives used to hedge debt</td>
<td>(3,965)</td>
<td>(1,176)</td>
<td>(1,972)</td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>(2,893)</td>
<td>(3,692)</td>
<td>(3,290)</td>
</tr>
<tr>
<td>Liquid financial assets available for sale</td>
<td>(22,266)</td>
<td>(18,963)</td>
<td>(20,538)</td>
</tr>
<tr>
<td>Net financial debt reclassified (IFRS 5)</td>
<td>1,354</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Net financial debt</strong></td>
<td><strong>37,425</strong></td>
<td><strong>33,015</strong></td>
<td><strong>33,388</strong></td>
</tr>
</tbody>
</table>
GROSS FINANCIAL DEBT AFTER SWAPS

Breakdown by type of rate
- Floating rate: 43%
- Fixed rate: 57%

Breakdown by currency
- USD: 5%
- GBP: 12%
- Other (1): 2%
- EUR: 81%

(1) Mainly CHF, PLN, CAD and JPY
BREAKDOWN OF BOND DEBTS BY CURRENCY

In millions of Euros, before swaps

<table>
<thead>
<tr>
<th>Currency</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR</td>
<td>479</td>
<td>1,191</td>
<td>3,439</td>
<td>2,341</td>
</tr>
<tr>
<td>GBP</td>
<td></td>
<td></td>
<td></td>
<td>491</td>
</tr>
<tr>
<td>USD</td>
<td>2,813</td>
<td>2,467</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of which (in €m eq.)
## MAIN OUTSTANDING BONDS AS OF 31 DECEMBER 2018

<table>
<thead>
<tr>
<th>Issue Date (1)</th>
<th>Maturity</th>
<th>Nominal amount (millions of currency units)</th>
<th>Currency</th>
<th>Coupon</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/2009</td>
<td>01/2019</td>
<td>2.000</td>
<td>USD</td>
<td>6.50%</td>
</tr>
<tr>
<td>01/2014</td>
<td>01/2019</td>
<td>1.250</td>
<td>USD</td>
<td>2.15%</td>
</tr>
<tr>
<td>01/2010</td>
<td>01/2020</td>
<td>1.400</td>
<td>USD</td>
<td>4.60%</td>
</tr>
<tr>
<td>05/2008</td>
<td>05/2020</td>
<td>1.200</td>
<td>EUR</td>
<td>5.38%</td>
</tr>
<tr>
<td>10/2015</td>
<td>10/2020</td>
<td>1.500</td>
<td>USD</td>
<td>2.35%</td>
</tr>
<tr>
<td>01/2009</td>
<td>01/2021</td>
<td>2.000</td>
<td>EUR</td>
<td>6.25%</td>
</tr>
<tr>
<td>11/2013</td>
<td>04/2021</td>
<td>1.400</td>
<td>EUR</td>
<td>2.25%</td>
</tr>
<tr>
<td>01/2012</td>
<td>01/2022</td>
<td>2.000</td>
<td>EUR</td>
<td>3.88%</td>
</tr>
<tr>
<td>09/2012</td>
<td>03/2023</td>
<td>2.000</td>
<td>EUR</td>
<td>2.75%</td>
</tr>
<tr>
<td>09/2009</td>
<td>09/2024</td>
<td>2.500</td>
<td>EUR</td>
<td>4.63%</td>
</tr>
<tr>
<td>10/2015</td>
<td>10/2025</td>
<td>1.250</td>
<td>USD</td>
<td>3.63%</td>
</tr>
<tr>
<td>11/2010</td>
<td>11/2025</td>
<td>750</td>
<td>EUR</td>
<td>4.00%</td>
</tr>
<tr>
<td>10/2016</td>
<td>10/2026</td>
<td>1.750</td>
<td>EUR</td>
<td>1.00%</td>
</tr>
<tr>
<td>03/2012</td>
<td>03/2027</td>
<td>1.000</td>
<td>EUR</td>
<td>4.13%</td>
</tr>
<tr>
<td>01/2017</td>
<td>01/2027</td>
<td>107.900</td>
<td>JPY</td>
<td>1.09%</td>
</tr>
<tr>
<td>09/2018</td>
<td>09/2028</td>
<td>1.800</td>
<td>USD</td>
<td>4.50%</td>
</tr>
<tr>
<td>07/2001</td>
<td>07/2031</td>
<td>650</td>
<td>GBP</td>
<td>5.88%</td>
</tr>
<tr>
<td>02/2003</td>
<td>02/2033</td>
<td>850</td>
<td>EUR</td>
<td>6.63%</td>
</tr>
<tr>
<td>06/2009</td>
<td>06/2034</td>
<td>1.500</td>
<td>GBP</td>
<td>6.13%</td>
</tr>
<tr>
<td>10/2016</td>
<td>10/2036</td>
<td>750</td>
<td>EUR</td>
<td>1.88%</td>
</tr>
<tr>
<td>09/2018</td>
<td>09/2038</td>
<td>650</td>
<td>USD</td>
<td>4.88%</td>
</tr>
<tr>
<td>01/2009</td>
<td>01/2039</td>
<td>1.750</td>
<td>USD</td>
<td>6.95%</td>
</tr>
<tr>
<td>11/2010</td>
<td>11/2040</td>
<td>750</td>
<td>EUR</td>
<td>4.50%</td>
</tr>
<tr>
<td>10/2011</td>
<td>10/2041</td>
<td>1.250</td>
<td>GBP</td>
<td>5.50%</td>
</tr>
<tr>
<td>01/2014</td>
<td>01/2044</td>
<td>1.000</td>
<td>USD</td>
<td>4.88%</td>
</tr>
<tr>
<td>10/2015</td>
<td>10/2045</td>
<td>1.500</td>
<td>USD</td>
<td>4.75%</td>
</tr>
<tr>
<td>10/2015</td>
<td>10/2045</td>
<td>1.150</td>
<td>USD</td>
<td>4.95%</td>
</tr>
<tr>
<td>09/2018</td>
<td>09/2048</td>
<td>1.300</td>
<td>USD</td>
<td>5.00%</td>
</tr>
<tr>
<td>09/2010</td>
<td>09/2050</td>
<td>1.000</td>
<td>GBP</td>
<td>5.13%</td>
</tr>
<tr>
<td>10/2016</td>
<td>10/2056</td>
<td>2.164</td>
<td>USD</td>
<td>4.99%</td>
</tr>
<tr>
<td>01/2014</td>
<td>01/2114</td>
<td>1.350</td>
<td>GBP</td>
<td>6.00%</td>
</tr>
</tbody>
</table>

(1) Date of funds reception

---

**FOCUS ON CREDIT**

EDF
**FOCUS ON EDF HYBRID SECURITIES**

**Partial Hybrid Refinancing**

- Refinancing of existing hybrid bonds
- Extending the average hybrid duration by 6 months
- Decreasing the average hybrid cost

**Overview of Key Elements**

EDF refinanced proactively part of their hybrids:

- 25 September 2018: €1.25bn perpetual hybrid new issuance
- 2 October 2018: End of the partial tender offer on 4 existing hybrid bonds for a total of €1.25bn

The outstanding amount of hybrid securities remains unchanged after this exercise

**Hybrid Securities Snapshot Following Refinancing, 31 December 2018 (EUR and EUR eqv.)**

- **Total amount**: €10.66bn eqv.
- **Average tenor**: 5.9 years
- **Pre-tax average cost**: 5.18%

![Hybrid Debt Maturity Schedule Based On First Call Dates](image)

<table>
<thead>
<tr>
<th>Transaction Objectives</th>
<th>Overview of Key Elements</th>
</tr>
</thead>
</table>

**By currency**

- **USD**: 37%
- **GBP**: 21%
- **EUR**: 42%

*(1) Exchange rate as of 31 December /2018*
## GREEN BONDS: PROCEEDS ALLOCATION

<table>
<thead>
<tr>
<th>Issue date(1)</th>
<th>Maturité (en années)</th>
<th>Nominal amount (millions of currency units)</th>
<th>Currency</th>
<th>Allocated funds as of 31/12/2018 (millions of currency units)</th>
<th>Total (% of raised funds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 2013</td>
<td>7.5</td>
<td>1,400</td>
<td>EUR</td>
<td>1,400</td>
<td>Not included in Use of Proceeds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,400 (100%)</td>
</tr>
<tr>
<td>Oct. 2015</td>
<td>10</td>
<td>1,250</td>
<td>USD</td>
<td>1,250</td>
<td>Not included in Use of Proceeds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,250 (100%)</td>
</tr>
<tr>
<td>Oct. 2016</td>
<td>10</td>
<td>1,750</td>
<td>EUR</td>
<td>764</td>
<td>424</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,188 (68%)</td>
</tr>
<tr>
<td>Jan. 2017</td>
<td>12</td>
<td>19,600</td>
<td>JPY</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jan. 2017</td>
<td>15</td>
<td>6,400</td>
<td>JPY</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Green Bond Euro of October 2016

- Nearly 70% of allocated funds
  - ~2/3 dedicated to financing the construction of 5 wind projects in the United States and Canada and 1 solar project in Mexico
  - ~1/3 dedicated to the financing of more than 400 renovation, modernization and development operations of existing hydropower structures in France

- Finalization of the allocation of funds planned for 2019

(1) Date of funds reception
GREEN BONDS: AVOIDED CO₂ EMISSIONS

<table>
<thead>
<tr>
<th>Issue date</th>
<th>Funds raised</th>
<th>Funds allocated</th>
<th>Projects financed by the Green Bond</th>
<th>Part of the total investments financed by the Green Bond</th>
<th>Gross total capacity of GB funded projects (in MW)</th>
<th>Expected output (in TWh/year)</th>
<th>Expected avoided CO₂ emissions (in Mt/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 2013</td>
<td>€1.4bn</td>
<td>€1.4bn</td>
<td>13 EDF Renewables projects(^{(3)})</td>
<td>59%</td>
<td>1,755</td>
<td>7.0</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>976</td>
<td>4.1</td>
<td>1.64</td>
</tr>
<tr>
<td>Oct. 2015</td>
<td>$1.25bn</td>
<td>$1.25bn</td>
<td>7 EDF Renewables projects(^{(3,4)})</td>
<td>58%</td>
<td>1,306</td>
<td>5.4</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>832</td>
<td>3.3</td>
<td>1.97</td>
</tr>
<tr>
<td>Oct. 2016</td>
<td>€1.75bn</td>
<td>€764m</td>
<td>6 EDF Renewables projects(^{(4)})</td>
<td>65%</td>
<td>878</td>
<td>3.3</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>€424m</td>
<td>411 EDF hydro operations(^{(5)})</td>
<td>100%</td>
<td>17,064</td>
<td>0.2(^{(6)})</td>
<td>0.01(^{(6)})</td>
</tr>
</tbody>
</table>

- Decrease of about 10% in CO₂ emissions from Green Bonds No. 1 and 2 compared to emissions estimated at end-2017, due to lower network emission factors in the United States
- Share of Green Bond funded capacity owned by EDF at the end of December 2018:
  - Green Bond No. 1 (November 2013): 65%
  - Green Bond No. 2 (October 2015): 46%
  - Green Bond No. 3 (October 2016): 98%

The detailed list of EDF Renewables projects and hydraulic investment operations by category will be published in the 2018 EDF reference document.

\(^{(1)}\) Sum of the gross impacts of each project funded by the corresponding Green Bond
\(^{(2)}\) Sum of the impacts of each project weighted by the share of total investment funded by the corresponding Green Bond
\(^{(3)}\) Of which one project received funding from both Green Bonds of November 2013 and October 2015
\(^{(4)}\) Of which one project received funding from both Green Bonds of October 2015 and October 2016
\(^{(5)}\) Share of investments funded by EDF taken in full, including half of Romanche-Gavet investment amount
\(^{(6)}\) Only linked to additional output expected from development investments, including half of the additional output expected from the Romanche-Gavet project
### Comparative Debt Ratings

#### Sources: Rating Agencies as of 08/03/2019

(1) Update of the rating and outlook of EDF Group by S&P on 25 February 2019
(2) Update of the rating and outlook of EDF Group by Fitch on 28 September 2016
(3) Update of the rating and outlook of EDF Group by Moody’s on 9 November 2018

<table>
<thead>
<tr>
<th>Moody’s Ratings</th>
<th>S&amp;P Ratings</th>
<th>Moody’s Ratings</th>
<th>Fitch Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baa1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baa2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baa3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### S&P Ratings

<table>
<thead>
<tr>
<th>Company</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDF</td>
<td>Baa3</td>
</tr>
<tr>
<td>Engie</td>
<td>A3 stable</td>
</tr>
<tr>
<td>Vattenfall</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>A- stable</td>
</tr>
<tr>
<td>SSE</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>Enel</td>
<td>Baa2 stable</td>
</tr>
<tr>
<td>Innogy</td>
<td>Baa2 stable</td>
</tr>
<tr>
<td>E.ON</td>
<td>BBB stable</td>
</tr>
<tr>
<td>RWE</td>
<td>n.d.</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>Baa1 stable</td>
</tr>
<tr>
<td>SSE</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>Vattenfall</td>
<td>A3 stable</td>
</tr>
<tr>
<td>Innogy</td>
<td>Baa2 stable</td>
</tr>
<tr>
<td>E.ON</td>
<td>BBB stable</td>
</tr>
<tr>
<td>RWE</td>
<td>Baa3 stable</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>SSE</td>
<td>BBB+ negative</td>
</tr>
<tr>
<td>Vattenfall</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>Innogy</td>
<td>BBB+ stable</td>
</tr>
</tbody>
</table>
HISTORIC DATA

2018 RESULTS & PERSPECTIVES

FOCUS ON CREDIT

PROVISIONS & DEDICATED ASSETS

CSPE
<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current</td>
<td>Non Current</td>
</tr>
<tr>
<td>Provisions for back-end nuclear cycle</td>
<td>1,479</td>
<td>21,378</td>
</tr>
<tr>
<td>Provisions for nuclear decommissioning and last cores</td>
<td>290</td>
<td>25,032</td>
</tr>
<tr>
<td>Other provision for decommissioning</td>
<td>80</td>
<td>1,977</td>
</tr>
<tr>
<td>Provisions for employee benefits</td>
<td>1,106</td>
<td>20,630</td>
</tr>
<tr>
<td>Other provisions</td>
<td>2,529</td>
<td>2,356</td>
</tr>
<tr>
<td><strong>Total Provisions</strong></td>
<td><strong>5,484</strong></td>
<td><strong>71,373</strong></td>
</tr>
</tbody>
</table>
GROUP PROVISIONS FOR EMPLOYEE BENEFITS: CHANGE IN NET LIABILITY

In millions of Euros

- 2018 net expense: €20,826 (1)
- Translation adjustments and other changes in scope: -9
- Employer’s contribution to funds: -331
- Benefits paid: -1,063
- Actuarial differences: -3,152

31/12/2017: 20,826 (1)
31/12/2018: 17,688 (2)

(1) Including: provisions for employee benefits €21,736m and non-current financial assets (€910m)
(2) Including: provisions for employee benefits €18,625m and non-current financial assets (€937m)
GROUP NUCLEAR PROVISIONS

In millions of Euros

<table>
<thead>
<tr>
<th></th>
<th>31/12/2017</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Discount Rate</td>
<td>48,179</td>
<td>51,021</td>
</tr>
<tr>
<td>Reductions</td>
<td>-1,626</td>
<td></td>
</tr>
<tr>
<td>Allowances</td>
<td>+606</td>
<td></td>
</tr>
<tr>
<td>Discount unwinding</td>
<td>+2,080</td>
<td></td>
</tr>
<tr>
<td>Net discount rate decrease(2)</td>
<td>+2,004</td>
<td></td>
</tr>
<tr>
<td>Other changes</td>
<td>-222</td>
<td></td>
</tr>
<tr>
<td>O/w translation adjustments: -€91m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance sheet asset effect: +€1,169m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P&amp;L financial expenses:</td>
<td>+€835m</td>
<td></td>
</tr>
</tbody>
</table>

(1) Of which France (+€1,534m) and United Kingdom (+€537m)
(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
## FRANCE NUCLEAR PROVISIONS

### In millions of Euros

<table>
<thead>
<tr>
<th>Description</th>
<th>31/12/2017</th>
<th>Net allowances</th>
<th>Discounting&lt;sup&gt;(1)&lt;/sup&gt;</th>
<th>Other changes&lt;sup&gt;(2)&lt;/sup&gt;</th>
<th>31/12/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total provisions for back-end nuclear cycle</td>
<td>20,326</td>
<td>(710)</td>
<td>1,520</td>
<td>159</td>
<td>21,295</td>
</tr>
<tr>
<td>Provisions for management of spent fuel</td>
<td>10,786</td>
<td>(498)</td>
<td>651</td>
<td>(241)</td>
<td>10,698</td>
</tr>
<tr>
<td>Provisions for waste removal and conditioning</td>
<td>726</td>
<td>(19)</td>
<td>43</td>
<td>1</td>
<td>751</td>
</tr>
<tr>
<td>Provisions for long-term management of radioactive waste</td>
<td>8,814</td>
<td>(193)</td>
<td>826</td>
<td>399</td>
<td>9,846</td>
</tr>
<tr>
<td><strong>Total provisions for nuclear dismantling and last cores</strong></td>
<td>17,307</td>
<td>(86)</td>
<td>849</td>
<td>441</td>
<td>18,511</td>
</tr>
<tr>
<td>Provisions for dismantling power stations</td>
<td>14,920</td>
<td>(86)</td>
<td>752</td>
<td>399</td>
<td>15,985</td>
</tr>
<tr>
<td>Provisions for last cores</td>
<td>2,387</td>
<td>-</td>
<td>97</td>
<td>42</td>
<td>2,526</td>
</tr>
<tr>
<td><strong>TOTAL FRANCE NUCLEAR PROVISIONS</strong></td>
<td>37,633</td>
<td>(796)</td>
<td>2,369</td>
<td>600</td>
<td>39,806</td>
</tr>
</tbody>
</table>

NB: Regarding the allocation to Dedicated Assets for nuclear provisions coverage, please refer to the slide “Dedicated Assets” on p. 246.

<sup>(1)</sup> P&L financial expenses of which: cost of unwinding the discount: +€1,534m and impact of actual discount rate change for provisions with no asset on the balance sheet: +€835m

<sup>(2)</sup> Other changes include the changes in provisions with related assets (assets associated with provisions and underlying assets). These variations are not included in the income statement.
FRANCE NUCLEAR PROVISIONS

In millions of Euros

31/12/2017 37,633

31/12/2018 39,806

(1) 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

Balance sheet asset effect: +€718m
P&L financial expenses: +€835m
# France Nuclear Provisions: 2015-2018 Changes

<table>
<thead>
<tr>
<th>Year</th>
<th>Decommissioning costs plants in operation</th>
<th>Decommissioning costs closed plants</th>
<th>Costs on Cigéo storage project</th>
</tr>
</thead>
</table>
| 2015 | - Conclusions of the external audit commissioned by the DGEC on the cost of dismantling published in January 2016<sup>(1)</sup>, stating that the overall audit confirms EDF’s estimate of the cost of decommissioning its nuclear fleet. | - Update to the industrial dismantling scenario for UNGG reactors<sup>(2)</sup>:  
  - 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 | - Cost of the Cigéo project set at €25bn<sup>(4)</sup> by the Ministerial Order<sup>(3)</sup>, which substitutes the 2005 estimated benchmark cost of €20.8bn<sup>(1)</sup> on which EDF group used to rely.  
  - €0.8bn increase in provision |
| 2016 | - Extensive revision of the cost estimate for the decommissioning of the plants in operation, taking into account the DGEC audit recommendations.  
  - Limited changes of the cost estimate and related provisions: -€0.5bn<sup>(5)</sup> | - Update of the evaluation of the decommissioning costs of the 1st generation plants.  
  - These annual studies confirm the changes previously made and do not lead to a significant change in the provisions. | - Continuation of the design studies (ANDRA) |
| 2017 | - Having thoroughly revised the estimate, EDF continues to undertake an international comparison to back up its analyses taking care to take account of a number of factors that could distort direct comparisons. These include differences in the scope of the estimates or in the national (for example in France, this includes the number of plants) and regulatory contexts.  
  - Once revised, the estimate is reviewed annually. In 2017 and 2018 the adjustments were non-material. | - Annual estimate review → non-material adjustments.  
  - UNGG  
    - 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>(4)</sup> on the secure configuration and detailed 2017-2032 schedule sent at the end of December. | - Continued design studies (ANDRA)  
  - In January 2018, the ASN gave its recommendation on the Cigéo DOS: satisfactory technological maturity, request for a study on an alternative for storing bituminous waste.  
  - September 2018: expert group engaged by the French Directorate General of Energy and Climate (DGEC) to draw up an inventory of how bitumen is managed.  
  - Application dossier to build the facility by 2019 (for a permit in 2022) |
| 2018 | - Annual estimate review → non-material adjustments. | - UNGG  
  - The ASN sent its main questions and conclusions on the UNGG strategy dossier.  
  - Dismantling in the air, advantage of industrial demonstrator and the schedule for the first dismantled reactor (Chinon A2) seem to be approved.  
  - On the other hand, discussions continue on the schedule for dismantling the five other reactors. The ASN is expected to issue its conclusions after the EDF hearing by the college on 12 February 2019. | |

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(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 »
PRECISIONS ON THE VALUATION OF THE PWR(1) DISMANTLING COST ESTIMATE

- In 2016: reviews of the PWR decommissioning estimate considering the recommendations of the DGEC’s ordered audit and the experience gained from dismantling operations for first-generation reactors (particularly Chooz A)

- Implementation of a detailed analytical approach:
  - identifying all costs (engineering, construction work, operation and waste processing involved in future decommissioning of reactors) and assessing figures based on detailed timetables for plants decommissioning
  - assessment of costs specific to the «first of a kind» unit of each series: «first of a kind» unit 900MW transposed to 1,300MW and 1,450MW
  - Taking into account the effects of the series and mutualisation effects inherent to the France fleet’s size and configuration:
    - mutualisation effects: several reactors may share common buildings and facilities on the same site (in France, unlike other countries, there are no single reactors but sites with 2 or 4 and in one case 6 reactors); certain costs are not higher when 2 or 4 reactors are decommissioned on the same site (surveillance costs for example), waste processing in centralised facilities (for example for dismantling major components such as steam generators)
    - series effects (comparable in nature to the effects observed during construction of the fleet): in a fleet using the same technology, many studies do not need to be repeated each time, and robots and tooling can be largely reused from one site to another
  - Series and mutualisation effects in particular explain why it is not appropriate simply to compare the average decommissioning cost per reactor between the French fleet and other countries’ nuclear fleets.

- The implemented approach includes prudence factors:
  - the figures only marginally reflect changes in productivity and the learning effect
  - the estimate includes an assessment of risks, contingencies and uncertainties

- EDF is also continuing to support its analyses through an international comparison, making sure it takes into consideration factors that could distort direct comparisons (differences in scope of cost estimates, national or regulatory contexts, series and mutualisation effects specific to the French fleet, etc.)

- The 2017 and 2018 decommissioning estimate review led to non-significant adjustments

---

(1) PWR: Pressurized Water Reactor
To assess future dismantling costs, EDF uses in particular national and international feedback (from the OECD, IAEA, EU, etc.) accounting for:

- Differences in the estimate scopes
- National and regulatory contexts
- Difficulties in comparing estimates in different monetary units
- The irrelevance of using a comparison based on €/kWe

EDF's benchmarking shows that the estimate of dismantling costs of French power plants is in the upper end of the funded costs range.

Benchmark elements audited in the DGEC audit:

- The auditors confirmed that restatements are required to make international comparisons, and that direct comparison of cost expressed in € per installed kWe is inappropriate.
- The auditors conducted an independent comparison in men/year that reflects the cost of dismantling, as manpower is a major factor in this activity, and is not sensitive to monetary effects.

In terms of international benchmarking, the DGEC audit concluded that the men/year amounts converge when adjustments to homogenise the scope are performed, and that the French quote offers the highest estimate of overall needs.
A direct comparison of nuclear provisions (dismantling and downstream cycle) in EDF’s accounts with German plant operators’ provisions is hindered by the important provisions aggregation reported by German plant operators’ higher level of dismantling provisions, when compared to their installed base, may be due to several factors:

- **The effect of discounting, as the French fleet is younger**: a 10-year time lag lowers provisions by 25%
- **Differences in scope**: in Germany, dismantling costs include the costs of building and operating an on-site spent fuel storage building
- **By conception**, dismantling cost for PWR reactors are lower than all other types of reactors (easy access to all equipments and nuclear wastes restricted to the primary circuit and associated wastes)
- **Structural differences in organisation and industrial choices**: German reactors are of various types and are run in a decentralised manner, in contrast to the integrated and standardised fleet in France
- **Decontamination operations**: in Germany, unlike in France, the legislation makes it possible to decontaminate certain wastes and transport them using conventional channels if the level of activity reached is below the “release threshold”. German operators are encouraged to decontaminate in order to keep from storing nuclear waste, which is very expensive in the absence of an appropriate channel.

EDF’s specific factors explain why its nuclear provisions are lower than some other operators.
A boiling water reactor (BWR) has more areas contaminated by primary circuit water and larger areas generating nuclear waste than a pressurised-water reactor (PWR)
The discount rate determined under the Company’s usual method is 3.9% at 31 December 2018, assuming an inflation rate of 1.5%.

<table>
<thead>
<tr>
<th></th>
<th>December 2017</th>
<th>December 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal discount rate</td>
<td>4.1%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Regulatory ceiling rate</td>
<td>4.2% (1)</td>
<td>4.0% (2)</td>
</tr>
<tr>
<td>Inflation</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

- The decrease in the actual discount rate from 2.6% to 2.4% resulted in a +€1,553m increase of nuclear provisions in 2018, of which +€835m in financial expenses and +€718m in the increase of asset value in the balance sheet.
- The regulatory ceiling was modified by the Order of 29 December 2017 (please refer to the next page).

(1) 4.16% rounded to 4.2%  
(2) 3.97% rounded to 4.0%
The discount rate applied for nuclear provisions in France must comply with two regulatory limits, which changed in 2017.

Until 2016 (Order of 24 March 2015) the applied discount rate had indeed to remain lower than:
- A regulatory ceiling “equal to the arithmetic average over the 120 most recent months of the constant 30-year rate (TEC 30 years), observed on the last date of the period concerned, plus one percent (100 base points)”
- The expected rate of return on assets covering the liability (dedicated assets)

As of 2017 (Order of 29 December 2017) the calculation of the regulatory ceiling changes as follows: the regulatory ceiling is defined until 31/12/2026 as weighted averages of a 1st term fixed at 4.3% and a 2nd term corresponding to the arithmetic average over the last 48 months of the TEC 30 plus 100 base points (1%). The weighting assigned to the 1st constant term of 4.3% decreases linearly from 100% at the end of 2016 to reach 0% at the end of 2026.

Under the new formula, the regulatory ceiling will gradually migrate over 10 years from its level at 31 December 2016 (4.3%) to a level in 2026 equal to the average constant 30-year rate (TEC 30 years) over the four most recent years, plus 100 base points.

The application of the formula as at 31/12/2018 presents a discount rate regulatory ceiling of 4.0% (3.97% rounded to 4.0%).
Based on assumptions made for the TEC 30, the formula for calculating the regulatory ceiling would likely lead to a discount rate of 3.8% at end-2019.

All things being equal, depending on the discount rate and inflation rate assumptions, the sensitivity to a decrease in the real discount rate of 0.1% (excluding the associated tax effect) would be:

- On the balance sheet provision: €903m (including €786m for provisions covered by dedicated assets)
- On the result before taxes: €(523)m

This increase in nuclear provisions, in particular those subject to dedicated assets, does in no way prejudge the direct transposition onto the Group’s Net financial debt of the dates under consideration, given that the amount to be allocated for each year may vary, particularly depending on:

- the profitability of the dedicated assets and the resulting coverage rate (no need to allocate once the coverage rate has reached 110%)
- the period within which the allocation is made, the regulations allowing ministers to set a maximum period of 3 years to make the allocation (Article 14 of the amended decree of 23 February 2007 and Article L594-5 of the French Environmental Code). Taking into account the changes in assumptions for the calculation of long-term nuclear provisions (excluding regulatory changes), in particular the change in the discount rate, the 2018 dedicated-asset allocation obligation amounts to €1,337 million. As agreed with the administrative authority and in accordance with the regulation, EDF will spread these allocations over 2019, 2020 and 2021. Including this allocation amount, all other things being equal, the resulting coverage rate would be 103.1% at 31 December 2018.
## DISCOUNT RATE OF NUCLEAR PROVISIONS IN FRANCE (4/4)

### SENSITIVITY ANALYSIS TO THE DISCOUNT RATE

<table>
<thead>
<tr>
<th>For a variation of 20 base points</th>
<th>Provisions (discounted value)</th>
<th>Sensitivity to the discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>On balance sheet provisions</td>
</tr>
<tr>
<td>In millions of Euros</td>
<td>0.20 %</td>
<td>-0.20 %</td>
</tr>
<tr>
<td><strong>Back-end nuclear</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management of nuclear fuel</td>
<td>10,698</td>
<td>(218)</td>
</tr>
<tr>
<td>Provisions for waste removal and conditioning</td>
<td>751</td>
<td>(23)</td>
</tr>
<tr>
<td>Long-term management of radioactive waste</td>
<td>9,846</td>
<td>(597)</td>
</tr>
<tr>
<td><strong>Dismantling and last cores</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For decommissioning permanently shut-down nuclear plants</td>
<td>12,480</td>
<td>(496)</td>
</tr>
<tr>
<td>For decommissioning nuclear plants in operation</td>
<td>3,505</td>
<td>(138)</td>
</tr>
<tr>
<td>Last cores</td>
<td>2,526</td>
<td>(88)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39,806</strong></td>
<td><strong>(1,560)</strong></td>
</tr>
</tbody>
</table>
EDF SA DEDICATED ASSETS

In billions of Euros

<table>
<thead>
<tr>
<th>Provisions for last cores (back-end of the nuclear cycle)</th>
<th>25.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisions for dismantling of nuclear plants</td>
<td>14.9</td>
</tr>
<tr>
<td>Provisions for LT management of radioactive waste</td>
<td>10.5</td>
</tr>
<tr>
<td>Provisions</td>
<td>0.5</td>
</tr>
<tr>
<td>Dedicated assets in realisable value</td>
<td>5.2</td>
</tr>
<tr>
<td>Yield Assets</td>
<td>28.1</td>
</tr>
<tr>
<td>Growth Assets</td>
<td>10.1</td>
</tr>
<tr>
<td>Fixed-income Assets</td>
<td>12.8</td>
</tr>
<tr>
<td>Provisions</td>
<td>28.2</td>
</tr>
<tr>
<td>Provisions for last cores (back-end of the nuclear cycle)</td>
<td>0.5</td>
</tr>
<tr>
<td>Provisions for dismantling of nuclear plants</td>
<td>16.0</td>
</tr>
<tr>
<td>Provisions for LT management of radioactive waste</td>
<td>11.7</td>
</tr>
<tr>
<td>Provisions</td>
<td>27.7</td>
</tr>
<tr>
<td>Provisions for last cores (back-end of the nuclear cycle)</td>
<td>0.5</td>
</tr>
<tr>
<td>Provisions for dismantling of nuclear plants</td>
<td>10.1</td>
</tr>
<tr>
<td>Provisions for LT management of radioactive waste</td>
<td>12.2</td>
</tr>
<tr>
<td>Provisions</td>
<td>5.4</td>
</tr>
<tr>
<td>Yield Assets</td>
<td>28.2</td>
</tr>
<tr>
<td>Growth Assets</td>
<td>10.1</td>
</tr>
<tr>
<td>Fixed-income Assets</td>
<td>12.2</td>
</tr>
</tbody>
</table>

- As of 31 December 2018, the regulatory coverage ratio for nuclear liabilities eligible for EDF’s dedicated assets is 98.3%\(^{(2)}\) versus 108.5% as of 31 December 2017.
- Regulatory obligations to allocate dedicated assets to offset the effect of changes in assumptions on provisions (mainly discount rates); the allocation for 2018 was €1,337 million. The administrative authority authorised EDF to spread this allocation up to €540 million over 2019 (i.e. around 40% of the allocation) and 2020, and €257 million over 2021. Taking into account the allocation in 2019 for 2018, the pro forma coverage rate at 31/12/2018 would thus be 100.2%.

\(^{(1)}\) This does not include the dedicated assets of Framatome and Socodei
\(^{(2)}\) The very volatile market conditions at end-2018 affected the rate on 31/12/2018. If the performance in December 2018 of the listed shares and bonds had been nil instead of being strongly negative, the coverage rate estimated at that date would have been >100%. Given the market rebound in January 2019, the estimated coverage rate was above 100% at 31/01/2019.
PROVISIONS RELATED TO NUCLEAR GENERATION IN FRANCE
PART TO BE COVERED BY DEDICATED ASSETS (DA)

Total provisions related to nuclear generation in France

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last core front-end part</td>
<td>39.8</td>
</tr>
<tr>
<td>Last core back-end part</td>
<td>2.0</td>
</tr>
<tr>
<td>Decommissioning permanently shut-down nuclear plants</td>
<td>0.5</td>
</tr>
<tr>
<td>Decommissioning nuclear plants in operation</td>
<td>3.5</td>
</tr>
<tr>
<td>Long-term management of radioactive waste</td>
<td>12.5</td>
</tr>
<tr>
<td>Waste removal and conditioning</td>
<td>9.8</td>
</tr>
<tr>
<td>Management of nuclear fuel (Non recyclable in existing installations part)</td>
<td>0.8</td>
</tr>
<tr>
<td>Management of nuclear fuel (Recyclable in existing installations part)</td>
<td>1.1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste removal and conditioning</td>
<td>28.2</td>
</tr>
<tr>
<td>Management of nuclear fuel (Non recyclable in existing installations part)</td>
<td>3.5</td>
</tr>
<tr>
<td>Long-term management of radioactive waste</td>
<td>12.5</td>
</tr>
<tr>
<td>Management of nuclear fuel (Recyclable in existing installations part)</td>
<td>9.8</td>
</tr>
<tr>
<td>Decommissioning nuclear plants in operation</td>
<td>0.5</td>
</tr>
<tr>
<td>Decommissioning permanently shut-down nuclear plants</td>
<td>0.8</td>
</tr>
</tbody>
</table>

(1) Related to the operating cycle
A new strategic allocation was defined in 2018 to improve the fit of the dedicated assets portfolio with the long-term nature of the disbursements to be hedged.

The targets of the new allocation will be achieved progressively according to the investments.

**EVOLUTION OF THE STRATEGIC ALLOCATION OF DEDICATED ASSETS**

**Former strategic allocation since 2013**
- **Fixed-income assets** (39%): Bonds, Debt Fund, Receivables, Cash
- **Yield Assets** (22%): Infrastructures, Real Estate
- **Growth assets** (39%): Shares, Funds of Shares

**New strategic allocation in effect since June 2018**
- **Fixed-income assets** (30%): Bonds, Debt Fund, Receivables, Cash
- **Yield Assets** (30%): Infrastructures, Real Estate
- **Growth assets** (40%): Shares, Funds of Shares

Strengthening the share of Yield assets
PERFORMANCE OF EDF SA DEDICATED ASSETS (1)

Yield Assets: +7.0%
- Satisfactory performance of yield assets (infrastructure and real estate). In 2018, EDF Invest continued to grow and develop its portfolio.

Growth assets: -7.0%
- Performance was primarily impacted by volatility in the international equity markets, especially in the last quarter, despite the prudent management model that remained relatively neutral in terms of geographical allocation.

Fixed-income assets: -0.4%
- The persistent low-rate environment weighed on performance, despite the prudent management approach in the bond markets. We maintained exposure relatively low, reduced exposure to Italian government bonds in the second half and to the credit market at the start of the year.
- The CSPE (contribution to electricity public service) debt was reimbursed in accordance with the provisional schedule: €1,194 million in repayment of the principal was received in 2018 in respect of 2018, and reinvested as per the strategic allocation.

2018 performance: -1.6%(1)
Performance up 5.7% on an annualised average basis since 2004

(1) Pre-tax performance

Composition of the portfolio at 31 December 2018
In millions of Euros, realisable value

- Yield Assets: ~19%
  - Fixed-income assets: ~44%
    - Of which, other yield assets: ~2,618
      - Of which, CTE: ~2,738
  - Growth assets: ~37%
    - Of which, other fixed-income assets: ~10,145
    - Receivable CSPE: ~2,080

In millions of Euros, realisable value

Yield Assets: 5,356
- Of which, other yield assets: 2,618
  - Of which, CTE: 2,738

Growth Assets: 10,108
- Of which, other fixed-income assets: 10,145
- Receivable CSPE: 2,080
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 French government budgets the public service costs for energy (electricity and gas) which are still calculated by the French Energy Regulatory Commission (CRE) and divided into two accounts: the "Energy Transition" special purpose account and the "Public Energy Service" account in the French general budget. The 2018 French finance act allocates €7,184 million to the special purpose account (for all operators), funded mainly by the French domestic tax on fuel and diesel (TICPE), and €3,044 million (for all operators) to the general budget.

- Each year, the CRE publishes a decision: the 12 July 2018 decision relates to actual 2017 costs, the reforecast 2018 costs and the initial 2019 forecast costs.

- Adoption of the CRE decision into a French finance act: in practice, the 2018 amended French finance act includes a €595 million reduction in the allocation to the special purpose account compared with the 2018 French finance act, to factor in the €400 million reduction in costs for 2018, as well as the difference between the re-forecast and actual costs for 2017 for €195 million.

As of 1 January 2017, the French government compensates for the cost of purchase obligation contracts, in accordance with the principle of full compensation of costs incurred by operators (€45 million a year).

Repayment 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 CSPE (French contribution to electricity public service) tax is no longer automatically increased (+ €3/MWh per year between 2013 and 2016). It has remained stable at €22.5/MWh since 2016 (full rate). Since early 2017, the tax is paid into the French general budget and not the Energy Transition special purpose account, as was the case in 2016.
Article L121-6 of the Energy Code stipulates that the charges attributable to the public service tasks assigned to the electricity operators are fully compensated by the State.

<table>
<thead>
<tr>
<th>In millions of Euros</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase obligations(^1)</td>
<td>4,472</td>
<td>4,681</td>
<td>4,856</td>
</tr>
<tr>
<td>Other(^2)</td>
<td>2,038</td>
<td>1,866</td>
<td>1,698</td>
</tr>
<tr>
<td>Total EDF CSPE</td>
<td>6,510</td>
<td>6,547</td>
<td>6,554</td>
</tr>
</tbody>
</table>

Stability of public service charges in 2018 mainly due to two antagonistic effects. On the one hand, an increase in the cost of purchase obligations related to the development of the renewable generation fleet in France, and a strong wind generation; on the other hand, a decrease in the costs associated with social measures in connection with the implementation on 1 January 2018 of the "energy check" scheme, the costs of which are supported directly by the State.

The expenses associated with the ZNIs increase moderately (+57M€). Public service charges in NZIs vary with energy and fuel purchases, the replacement cost of old power plants and volumes of purchase obligations.

\(^1\) 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\(^3\), the TPN (First Necessity Tariff) and the FSL (Housing Solidarity Fund).

\(^3\) ZNI: Zones non interconnectées corresponding to overseas departments and Corsica.
**CSPE (3/4): CHANGE IN PURCHASE OBLIGATIONS IN MAINLAND FRANCE FOR EDF**

**Principle:** The compensation mechanism of public energy services charges offsets the difference between the cost of purchase obligations in mainland France and market prices.

- **2015:**
  - Purchase obligations amount: €6,030M
  - Average spot price: €38.6/MWh
  - Cost of purchase obligations valued at market prices based on CRE methodology: €1,752M

- **2016:**
  - Purchase obligations amount: €6,199M
  - Average spot price: €36.7/MWh
  - Cost of purchase obligations valued at market prices based on CRE methodology: €1,727M

- **2017:**
  - Purchase obligations amount: €6,760M
  - Average spot price: €45.0/MWh
  - Cost of purchase obligations valued at market prices based on CRE methodology: €2,079M

- **2018:**
  - Purchase obligations amount: €4,856M
  - Average spot price: €50.2/MWh
  - Cost of purchase obligations valued at market prices based on CRE methodology: €2,705M

(1) EDF SA excluding island activities
Repayment of the compensation deficit in accordance with the Decree of 2 December 2016 adopted pursuant to Article 4 of the Decree of 13 May 2016, adopted pursuant to Article R. 121-31 of the French Energy Code

- Confirmation of the debt due to EDF and recognised by the French government at end-2015 at €5.9 billion, including the deficit recorded up to 2015 and related interest, and confirmation of the repayment schedule to 2020
- The annual payment and related interest (1.72%) will first be offset against EDF’s other costs, in accordance with Article R. 121-33 of the French Energy Code

<table>
<thead>
<tr>
<th>In millions of euro</th>
<th>Compensation deficit remaining due at 31 December of year N (excluding 2015 interest)</th>
<th>Repayment of the principal of the above deficit by the special purpose account (overall portion)</th>
<th>Repayment of the principal of the above deficit by the special purpose account(1)</th>
<th>Payment of future interest related to the above deficit by the French general budget (overall portion)</th>
<th>Payment of related future interest by the French general budget(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>5,779.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2016</td>
<td>5,585.8</td>
<td>194.0</td>
<td>194.0</td>
<td>99.3</td>
<td>99.3</td>
</tr>
<tr>
<td>2017</td>
<td>4,357.8</td>
<td>1,228.0</td>
<td>903.8</td>
<td>99.5</td>
<td>73.2</td>
</tr>
<tr>
<td>2018</td>
<td>2,735.8</td>
<td>1,622.0</td>
<td>1,193.8</td>
<td>87.2</td>
<td>64.2</td>
</tr>
<tr>
<td>2019</td>
<td>896.8</td>
<td>1,839.0</td>
<td>1,353.5</td>
<td>62.5</td>
<td>46.0</td>
</tr>
<tr>
<td>2020</td>
<td>-</td>
<td>896.8</td>
<td>660.0</td>
<td>40.6(2)</td>
<td>29.9(3)</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
<td>5,779.8</td>
<td>4,305.1</td>
<td>389.1</td>
</tr>
</tbody>
</table>

The payment schedule remains unchanged: the only change since 2017 is the fact that EDF now receives only 73.6% of the payments from the French government, with the remaining 26.4% being paid to Société Générale and the Common Securitisation Fund to which part of the financial debt was transferred at end-2016.

Repayment of the 2016, 2017 and 2018 annual payments were made by the French government as per the schedule. At end-December 2018, the French government paid EDF €1,217 million from the special purpose account, including €1,194 million provided for the principal amount of the financial debt for 2018, and €23 million paid on 2 January 2018, to be allocated to the 2017 repayment schedule. In addition, the French government paid EDF €64 million from the French general budget in respect of interest on the 2018 debt. At end-2018, the French government still owes EDF €2,060 million, including €2,014 million in principal and €46 million in accrued interest not yet due.

(1) EDF now holds only 73.6% of the debt since the December 2016 sale, and therefore receives 73.6% of the scheduled payment flows
(2) Of which €32.3 million due for 2019 and €8.3 million due for 2020
(3) Of which €23.8 million due for 2019 and €6.1 million due for 2020
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### GREAT BRITAIN CAPACITY AUCTION RESULTS FOR EDF ENERGY (1)

Results from this year’s and previous capacity market auctions:
All capacity agreements for 1 year unless otherwise stated

<table>
<thead>
<tr>
<th>Year</th>
<th>Clearing price £/kW/year</th>
<th>Nuclear</th>
<th>Coal</th>
<th>CCGT (2)</th>
<th>OCGT (3)</th>
<th>Battery</th>
<th>Demand-Side Response (DSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Q-1 (2017/2018)</td>
<td>6.95 (no indexation)</td>
<td>All 16 units (7.9GW)</td>
<td>All 8 units (3.5GW)</td>
<td>All 3 units (1.2GW)</td>
<td>All 2 units (38MW)</td>
<td>N/A</td>
<td>2 units (9.6MW)</td>
</tr>
<tr>
<td>2014 Q-4 (2018/2019)</td>
<td>19.4 (2012/2013 prices)</td>
<td>All 16 units (7.9GW)</td>
<td>7 of 8 units (3.1GW)</td>
<td>All 3 units (1.2GW)</td>
<td>All 2 units (37MW)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2018 Q-1 (2018/2019)</td>
<td>6.0 (no indexation)</td>
<td>N/A</td>
<td>1 unit (0.4GW)</td>
<td>N/A</td>
<td>N/A</td>
<td>1 unit (10.5MW) (5)</td>
<td>2 units (12.8MW)</td>
</tr>
<tr>
<td>2015 Q-4 (2019/2020)</td>
<td>18.0 (2014/2015 prices)</td>
<td>All 16 units (7.6GW)</td>
<td>0 unit</td>
<td>All 3 units (1.2GW)</td>
<td>All 2 units (37MW)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2016 Q-4 (2020/2021)</td>
<td>22.5 (2015/2016 prices)</td>
<td>All 16 units (7.9GW)</td>
<td>3 of 8 units (1.3GW)</td>
<td>All 3 units (1.2GW)</td>
<td>All 2 units (38MW)</td>
<td>1 unit (47MW)</td>
<td>N/A</td>
</tr>
<tr>
<td>2018 Q-4 (2021/2022)</td>
<td>8.4 (2016/2017 prices)</td>
<td>All 16 units (7.9GW)</td>
<td>0 unit</td>
<td>All 3 units (1.2GW)</td>
<td>0 unit</td>
<td>N/A</td>
<td>5 units (32.1MW)</td>
</tr>
</tbody>
</table>

(1) Following a judgment by the General Court of the Court of Justice of the European Union which removed the European Commission’s State aid approval of Great Britain’s Capacity Market (CM) on 15 November 2018, the UK Government has suspended the operation of the scheme until the scheme can be reapproved.

(2) Combined Cycle Gas Turbine
(3) Open Cycle Gas Turbine
(4) 3 year refurbishing agreements that were reverted to 1 year agreements
(5) Battery further de-rated to 21% from 96%
(6) T-4 2015 had a lower total connection capacity for Nuclear units
(7) 15 year capacity agreement for new build battery
N/A: Not applicable

*The slide includes capacities that agreements were awarded for (de-rated capacity)
For DSR this equates to bidding capacities*
MARKETS: ELECTRICITY CONSUMPTION
(DATA NOT ADJUSTED FOR WEATHER AND CALENDAR)

In TWh

France

Source: RTE

The United Kingdom

Source: BEIS

Italy

Source: Terna
Despite a milder winter, spot prices in 2018 are up everywhere in Europe compared to 2017 due to:

- The rise in commodities prices, between March and October 2018 mainly
- A summer with little wind in Germany

A coupling of the markets which is limited by the capacities available at the borders

Average observed spot market price for 2017:

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

(1) Change compared to average prices in 2017
(2) Trade (Source: ENTSO-E Transparency Website) and change compared to 2017
(3) Implementation of the flow-based coupling mechanism from 21 May 2015 for all CWE (France, Benelux, Germany)
The French cross-border trade balance was 60.2 TWh in 2018 (+22.3 TWh compared to 2017). Exports increased (+12.2 TWh vs. 2017) while imports decreased (-10.1 TWh vs. 2017). France has been a net exporter on all its borders in 2018: 18.5 TWh to Italy, 13.0 TWh to the United Kingdom, 12.0 TWh to Spain, 10.6 TWh to Switzerland and 6.1 TWh to the CWE\(^{(1)}\) area.

Source: RTE, data for December 2017 estimated because not yet available

\(^{(1)}\) Continental Western Europe (Germany, Belgium, France, Luxembourg and the Netherlands)
# French Power Trade Balances at Its Borders

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
<td>Total</td>
</tr>
<tr>
<td>CWE(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>1.6</td>
<td>3.6</td>
<td>3</td>
<td>0.5</td>
<td>8.6</td>
</tr>
<tr>
<td>imports</td>
<td>4.7</td>
<td>2.6</td>
<td>3.9</td>
<td>8.4</td>
<td>19.6</td>
</tr>
<tr>
<td>balance</td>
<td>-3.1</td>
<td>1</td>
<td>-1</td>
<td>-7.9</td>
<td>-11</td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>2.1</td>
<td>3.9</td>
<td>3.8</td>
<td>1.9</td>
<td>11.7</td>
</tr>
<tr>
<td>imports</td>
<td>0.8</td>
<td>0.5</td>
<td>0.6</td>
<td>1.9</td>
<td>3.8</td>
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<td>balance</td>
<td>1.3</td>
<td>3.4</td>
<td>3.2</td>
<td>0</td>
<td>7.9</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>3.7</td>
<td>5.1</td>
<td>4.9</td>
<td>3.2</td>
<td>17</td>
</tr>
<tr>
<td>imports</td>
<td>2</td>
<td>0.4</td>
<td>0.2</td>
<td>1.8</td>
<td>4.3</td>
</tr>
<tr>
<td>balance</td>
<td>1.8</td>
<td>4.8</td>
<td>4.7</td>
<td>1.4</td>
<td>12.6</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>4.9</td>
<td>4.5</td>
<td>4.8</td>
<td>4.6</td>
<td>18.8</td>
</tr>
<tr>
<td>imports</td>
<td>0.3</td>
<td>0.1</td>
<td>-</td>
<td>0.2</td>
<td>0.6</td>
</tr>
<tr>
<td>balance</td>
<td>4.6</td>
<td>4.4</td>
<td>4.8</td>
<td>4.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Switzerland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>5.7</td>
<td>2.8</td>
<td>3.6</td>
<td>5.3</td>
<td>17.3</td>
</tr>
<tr>
<td>imports</td>
<td>1.4</td>
<td>2.2</td>
<td>2.3</td>
<td>1</td>
<td>6.9</td>
</tr>
<tr>
<td>balance</td>
<td>4.2</td>
<td>0.6</td>
<td>1.3</td>
<td>4.3</td>
<td>10.4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td>18</td>
<td>19.8</td>
<td>20.1</td>
<td>15.5</td>
<td>73.5</td>
</tr>
<tr>
<td>imports</td>
<td>9.3</td>
<td>5.7</td>
<td>7</td>
<td>13.2</td>
<td>35.3</td>
</tr>
<tr>
<td>balance</td>
<td>8.7</td>
<td>14.1</td>
<td>13.1</td>
<td>2.3</td>
<td>38.2</td>
</tr>
</tbody>
</table>

|                  | 2018    |        |        |        |        |
|                  | Q1      | Q2     | Q3     | Q4     | Total  |
| CWE(2)           |         |        |        |        |        |
| exports          | 2.6     | 7.7    | 5.3    | 3.0    | 18.5   |
| imports          | 6.3     | 1.5    | 1.7    | 2.9    | 12.4   |
| balance          | -3.7    | 6.1    | 3.6    | 0.0    | 6.1    |
| United Kingdom   |         |        |        |        |        |
| exports          | 3.8     | 3.7    | 3.8    | 3.5    | 14.7   |
| imports          | 0.2     | 0.3    | 0.5    | 0.8    | 1.8    |
| balance          | 3.59    | 3.39   | 3.31   | 2.68   | 13.0   |
| Spain            |         |        |        |        |        |
| exports          | 4.0     | 4.9    | 4.7    | 2.9    | 16.4   |
| imports          | 1.6     | 0.4    | 0.6    | 1.9    | 4.4    |
| balance          | 2.4     | 4.5    | 4.1    | 1.0    | 12.0   |
| Italy            |         |        |        |        |        |
| exports          | 5.8     | 4.8    | 4.3    | 4.2    | 19.1   |
| imports          | 0.1     | 0.0    | 0.1    | 0.3    | 0.5    |
| balance          | 5.7     | 4.8    | 4.2    | 3.9    | 18.5   |
| Switzerland      |         |        |        |        |        |
| exports          | 6.3     | 4.2    | 2.3    | 4.8    | 17.6   |
| imports          | 1.4     | 2.1    | 2.1    | 1.3    | 7.0    |
| balance          | 4.9     | 2.0    | 0.2    | 3.4    | 10.6   |
| TOTAL            |         |        |        |        |        |
| exports          | 22.5    | 25.2   | 20.4   | 18.3   | 86.3   |
| imports          | 9.6     | 4.4    | 4.9    | 7.2    | 26.1   |
| balance          | 12.9    | 20.8   | 15.5   | 11.1   | 60.2   |

Source: RTE  
(1) Rounded to the nearest tenth  
(2) CWE flow-based coupling zone composed of Germany, Belgium, France, Luxembourg and the Netherlands, set up in May 2015
In 2018, the average baseload electricity spot price was €50.2/MWh, up €5.2/MWh vs last year. After a sharp fall in prices in January (-€43/MWh vs. Jan. 2017) following much milder temperatures in 2018, the prices of the rest of the year are generally up (+€10/MWh on average) due to the sharp rise in commodities prices between March and October, a hot and low windy summer and a late cold snap at the end of February 2018.

Source: EPEX
FRANCE: PEAKLOAD ELECTRICITY SPOT PRICES

Daily average in €/MWh

In 2018, the average peakload electricity spot price was €59.1/MWh, up €5.4/MWh versus 2017

Source: EPEX
FRANCE/GERMANY SPREAD FROM 01/01/2017 TO 31/12/2018

Daily spread in €/MWh over 5 rolling days

Note: Over the period, the France/Germany spread reached its minimum on 19 May 2018 at -€13.73/MWh, and its maximum on 29 October 2017 at €92.37/MWh.
FORWARD ELECTRICITY PRICES IN FRANCE, THE UK, ITALY AND GERMANY (Y+1) FROM 01/01/2017 TO 31/12/2018

In €/MWh

- Electricity - annual baseload contract France (EEX)
- Electricity - annual baseload contract Germany (EEX)
- Electricity - annual baseload contract UK (EDF Trading)
- Electricity - annual baseload contract Italy (EDF Trading)
FORWARD ELECTRICITY PRICES IN FRANCE, THE UK, ITALY AND GERMANY (Y+2) FROM 01/01/2017 TO 31/12/2018

In €/MWh

- Electricity - annual baseload contract France (EEX)
- Electricity - annual baseload contract Germany (EEX)
- Electricity - annual baseload contract UK (EDF Trading)
- Electricity - annual baseload contract Italy (EDF Trading)
Coal prices for delivery in Europe in N+1 averaged $87.0/t in 2018 (+18% or +$13.3/t vs. 2017). In Q1, the price of coal fell (-$13/t) due to the drop in oil prices and a significant supply in Asia (in Indonesia, a regulatory change pushes producers to export). Driven by a recovery in oil prices and rising demand from China and India, the price of coal increased by more than $27/t between late March and early October. After approaching the $100/t mark on 3 October, the highest level since February 2013, prices fell sharply in Q4 (-$15/t) following the drop in oil prices due to the limitation of Chinese imports and large stocks in the ports of Benelux, because of the low level of the Rhine limiting the routing to the German plants.
BRENT PRICES\textsuperscript{(1)} FROM 01/01/2017 TO 31/12/2018

The price of Brent averaged $71.7/bbl in 2018 (+31% or +$16.9/bbl vs. 2017). After a drop in early February (-$8/bbl) due to fears of a slowdown in global demand in the short term, the price of oil rose again between March and May (+$16/bbl) following the respect by the OPEC countries of the production limitation agreement and the withdrawal of the US from the Iranian nuclear deal. The price was then generally stable during the summer before rising between mid-August and early October (+$15/bbl) because of US threats to countries importing Iranian crude oil. The Q4 was marked by a fall in prices (-$29/bbl) driven by less severe sanctions than expected against Iran and very high levels of production in Russia and United States.

\textsuperscript{(1)} Brent spot price (M+1)
The price of the annual gas contract for N+1 delivery to PEG averaged €20.9/MWh in 2018 (+22% or €3.7/MWh vs. 2017). After remaining stable in Q1, the price of gas rose sharply between March and September (+€9/MWh) following the resumption of oil prices and tensions on the short-term storage level passed on in the long-term. It exceeded €27.4/MWh on 24/09, the highest level for almost 5 years. Related with the fall in the price of oil, the price of gas fell in Q4 (−€7/MWh) because of a very good supply of LNG in Europe as well as a comfortable storage level on the approach of winter. In France, 2018 saw the merger of the PEG Nord and TRS zones on 1 November to form a single market area named PEG.

(1) Price of France PEG Nord gas, then PEG from 01/11/2018
The price of the emission certificate for delivery in December N+1 averaged €16.2/t in 2018 (+175% or +€10.3/t vs. 2017).
The price of CO₂ increased between January and September due to the agreement on the EU-ETS reform for the period 2021-2030, intensified by the return of speculative players in the market. Increasingly volatile, particularly because of the chaotic advance of negotiations on Brexit, the price reached €25.6/t on 10/09, the highest level in 10 years, before falling more than €6/MWh in the following days. At the end of the year, trading in CO₂ allowances was dominated by the hedging activity of many players who often had purchase options expiring mid-December at an exercise price of around €20/MWh, before knowing a rise of €5/t due to a particularly important activity after the expiry of these options.
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FINANCIAL CALENDAR

14 May 2019  Q1 2019 sales

16 May 2019  General Shareholder’s meeting

26 July 2019  2019 half-year results
A TEAM DEDICATED TO ANALYSTS AND INVESTORS

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…on which you can download our Kit Investisseur including:

- The Analyst Pack, with all the main financial and extra-financial data in an Excel format

- The Reference Document of year 2018

- All the data relative to our annual results

For more information, our team is available to you at this address: EDF-IRTeam@edf.fr
GLOSSARY (1/5)

- **ANDRA**: the French law of 30 December 1991 established a public industrial and commercial body, the French National Radioactive Waste Management Agency (Agence Nationale pour la gestion des Déchets Radioactifs – “ANDRA”), responsible to find, implement and guarantee safe management solutions for all French radioactive waste. The Agency notably runs the storage centers based in the Aube region of France: the industrial facility for grouping, storage and disposal Cires and the waste disposal facility CSA.

- **APE**: the French State Shareholding Agency is a national department controlled by the Minister of Economy and Finance. Its mission is to act as a shareholder for the French Government in order to develop its assets to maximise the value of its stakes.

- **Architect-Assembler**: for EDF, the architect-assembler has control over the design and operation of its power plants; the organization of development projects; the schedule for completion and costs of construction; relations with the Nuclear Safety Authority; and the integration of feedback from operational experience. EDF’s role as architect-assembler ensures control over its industrial policy with respect to the design, construction and operation of its fleet of power plants.

- **ARENH**: Regulated Access to Historical Nuclear Energy

- **ASN (Autorité de Sûreté Nucléaire)**: the French Nuclear Safety Authority controls nuclear safety and radioprotection in France, on behalf of the French government, to protect workers, patients, the public and the environmental risks associated with the use of nuclear energy. It is notably in charge of the external control of nuclear facilities in France. The ASN is an independent administrative authority with a staff of more than 300. It is represented at the national level by the General Agency for Nuclear Safety and Radioprotection (or “DGSNR”).

- **Clean Dark Spread**: difference between power price and variable generation cost (mainly coal cost and CO₂ cost).

- **Combined-Cycle Gas Turbine (CCGT)**: most recent technology for generating electricity in a natural gas-fired plant. A combined cycle is made up of one or more combustion turbines and a steam turbine allowing for an improved yield. The syngas is routed to the combustion turbine, which generates electricity and very hot exhaust gases (effluents). The heat from the exhaust gases is recovered by a boiler, thus producing steam. Part of the steam is then recovered by the steam turbine to generate electricity.
**Cogeneration**: generation technique for combined electricity and heat generation. The advantage of cogeneration is the ability to capture the heat produced by the fuel, whereas in traditional electricity generation this heat is lost. This process also allows the same facility to meet the heating (hot water or steam) and electricity needs of both industrial and local authority customers. This system improves the energy efficiency of the generation process and reduces fuel use by an average of 20%.

**CRE (Commission de Régulation de l’Energie)**: created on 30 March 2000. The CRE, an independent body, regulates the process of the energy market opening. It ensures that all of the generators and eligible customers have non-discriminatory access to the network. Within its jurisdiction, this body supervises and authorizes, settles any disputes and, if required, imposes sanctions. Since 2016, the CRE is in charge of proposing the evolution of the regulated tariffs for the sale of electricity.

**Distribution networks**: downstream of the transmission network, medium- and low-tension distribution networks that serve end-users (individuals, Groups, SMEs, SMIs, etc.).

**Electricity supply**: can be broken down into four types of consumption: “basic” (or “ribbon”) supply of electricity generated and consumed throughout the year; “semi-basic” electricity supply, which is generated and consumed over the winter period; “peak” electricity supply, which corresponds to periods of the year when electricity generation or consumption is significant; and “lace” supply which is a complement to the “ribbon” supply.

**EPIC**: Industrial and Commercial state-owned Company.

**EPR (European Pressurized Reactor)**: latest generation of reactors currently under construction (known as generation 3), it is the result of Franco-German cooperation, and offers advanced safety, environmental and technical performance.

**ETS**: Emission Trading System.
Fuel cycle: the nuclear fuel cycle encompasses all industrial operations in France and abroad which enable the supply of the fuel to generate energy in a reactor, then to unload and process it. The cycle can be broken down into three stages: 1) upstream: the processing of concentrates from uranium ore, the conversion, enrichment and production of fuel (which takes more than two years); 2) the core of the cycle corresponding to the use of fuel in the reactor: receipt, loading, operation and discharging (which takes three to five years); 3) downstream: pool storage, reprocessing of spent fuel in reactors of recoverable material, vitrification of highly radioactive waste, then temporary storage of the waste before storage.

Hydropower generation: maximum power energy that can be produced from hydraulic sources in normal conditions.

Interconnection: electricity transmission infrastructure that allows for exchanges of energy between different countries, by connecting the transmission network of one country to that of a neighboring country.

LDC: Local Distribution Companies that provide for distribution of gas and electricity to the end-customers on a delimited geographical area.

LNG (Liquefied Natural Gas): natural gas turned into liquid form by reducing its temperature to –162°C allowing for a reduction by 600 in its volume.

MEDEF: French companies association (“Mouvement des entreprises de France”).

Metering: a system allowing for the recording, at a given network connection point, of the volumes of electricity transmitted or distributed (power, frequency, active and reactive energy).

Midstream: all assets of the gas business, allowing for its availability, transportation and management. These might be infrastructures (gas pipelines, storage facilities, LNG terminals, etc.) or contractual (rights relating to predetermined capacity, procurement contracts, etc.). The midstream segment includes the trading and negotiating activities.

National Allowances Allocation Plan: this plan defines the total quantity of greenhouse gas emission allowances that the French state plans to grant for the allowances exchange system for each multi-year period (NAP1 2005-2007, NAP2 2008-2012) and the allocation method used to allocate allowances to the industrial facilities in question.
GLOSSARY (4/5)

- NOₓ: nitrogen oxide
- **Nuclear safety**: nuclear safety includes all of the technical, organizational and human measures which are intended to prevent accident risks and to limit the effects of an accident, and which are taken at every stage of the life of a nuclear power plant (from design to operation and finally to decommissioning)
- **Nuclear tranche**: electrical generation unit consisting of a nuclear boiler and a turbo-alternator generator. A nuclear tranche essentially consists of its reactor type and the power of its turbo-alternator generator. EDF nuclear plants include two or four tranches, and occasionally six
- **Ofgem**: Ofgem is the Office of the Gas and Electricity Markets in the UK. Its main missions consist of protecting consumers, regulating gas and electricity monopoly companies, helping to secure Britain’s energy supplies by promoting and regulating competitive gas and electricity markets. It also contributes to the drive to curb climate change and promote sustainable development
- **Plant availability**: fraction of power available, out of theoretical maximum energy, counting only technical non-availability. The availability coefficient (Kd) is defined as the ratio between annual actual generation capacity (or amount producible annually) and maximum theoretical generation capacity, where maximum theoretical generation capacity = installed capacity x 8,760h. The Kd, which includes only technical non-availability, i.e. scheduled shutdowns, unplanned outages and testing periods, characterizes a plant’s industrial performance
- **PPA**: Price Purchase Agreement
- **PWR**: in a Pressurized Water Reactor, the primary coolant (water) is pumped under high pressure to the reactor core where it is heated by the energy generated by the fission of atoms. The heated water then flows to a steam generator where it transfers its thermal energy to a secondary system where steam is generated and flows to turbines which, in turn, spin an electric generator. In contrast to a boiling water reactor (BWR), pressure in the primary coolant loop prevents the water from boiling within the reactor
GLOSSARY (5/5)

- **Renewable energies**: energies for which generation does not require extinction of the initial resource. They largely derive from geothermal, water, air, fire and solar sources. They include hydro, wind, solar (the energy produced by marine waves and currents), geothermal (energy derived from the heat of the earth's magma) energies, and bio-mass (energy derived from living matter, particularly wood and organic waste). They often include energy from the incineration of household or industrial waste.

- **RTE**: RTE is the operator of the French electricity transmission system. RTE, a public service company, operates, maintains and develops the high and very high voltage network.

- **SO₂**: sulfur oxide

- **Storage**: storage consists in placing packages of radioactive waste in a facility, ensuring their long-term management, i.e. under safe conditions allowing for long-term risks control.

- **Storage center**: low or medium-level short-life radioactive waste from nuclear plants, the Hague or CENTRACO facilities are sent to ANDRA's Soulaines storage center in the Aube region, which has been operational since 1992. This center has a capacity of 1,000,000cm, and an acceptance capacity of approximately 60 years. Very low-level short-life radioactive waste is sent to ANDRA's Morvilliers storage center (also in the Aube region). This center was commissioned in October 2003 and has an operating life of about 30 years.

- **Transmission networks**: networks providing for the transmission of electrical power at high and very high voltages from the generating sites to the distribution networks or industrial sites directly connected to it; this includes the major interconnection transmission network (400,000 volts and 225,000 volts) and the regional distribution networks (225,000 volts, 150,000 volts, 90,000 volts and 63,000 volts).

- **Waste**: nowadays, the nuclear generation of 1MWh of electricity (equivalent to the monthly consumption of two households) produces around 11g of total waste across all categories. Short-life waste represents more than 90% of the total waste, but contains only 0.1% of the total radioactivity of those 11g.