



WELCOME TO EDF CHATOU TRAINING CAMPUS R&D ACTIVITIES

EDF Lab Chatou is a long-established R&D site with cutting-edge expertise in hydraulics, renewable energies, nuclear power and environment.

- 13 hectares
- 61,000 m² of testing rooms
- More than 500 workstations
- 3 research departments



EDF GROUP 2018 KEY FIGURES

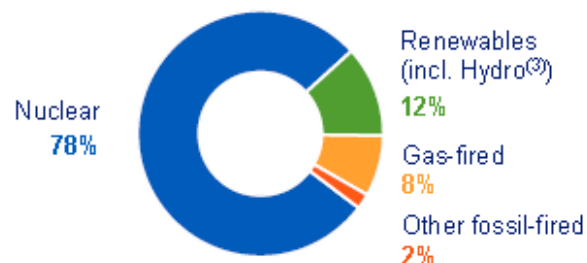
Operational figures as of end 2018

39.8 million customer sites

126.5GW⁽¹⁾ installed capacity



584.0TWh electricity output⁽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

⁽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

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)

CAP 2030: AMBITIOUS OBJECTIVES ON 3 STRATEGIC AXES

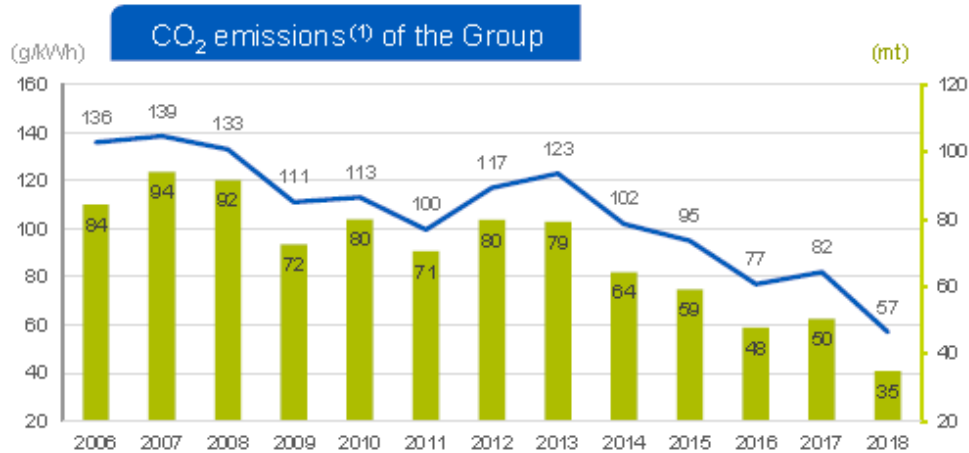
CUSTOMER PROXIMITY 	LOW-CARBON GENERATION 	INTERNATIONAL DEVELOPMENT 
<p>Create new, competitive decentralised solutions, new personalised energy services and smart grids</p> <ul style="list-style-type: none"> — Deploy new digital services for retail customers — Support the development of new uses of electricity (electric vehicles, buildings, etc.) — Accelerate R&D on storage, photovoltaics, electric mobility and new networks 	<p>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</p> <ul style="list-style-type: none"> — 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⁽¹⁾ — Commission up to 10 EPRs by 2030⁽²⁾ in France, the United Kingdom and internationally 	<p>Expanding into new geographical areas by developing our low-carbon solutions in growth countries while bolstering our positions in Europe</p> <ul style="list-style-type: none"> — 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

CO₂ EMISSIONS REDUCTION

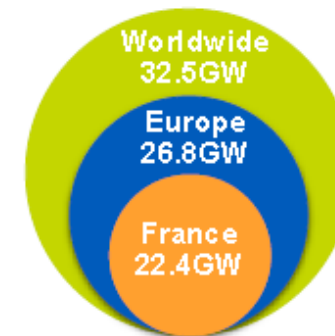
The reduction in CO₂ emissions is the result of a long-term low-carbon industrial policy with the closure of coal-fired power plants and the improving of the efficiency of thermal power plants and the environmental performance of the power generating fleet.



⇒ **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

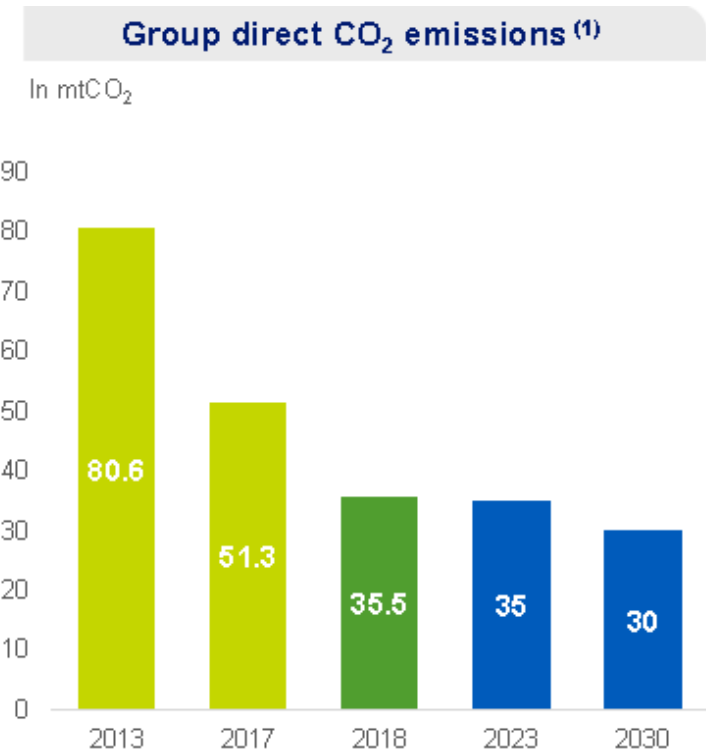


2018	Specific CO ₂ emissions ⁽¹⁾ (g/kWh)
France – Generation and supply activities	14
France – Regulated activities	502
EDF Group worldwide	57

⁽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.

EDF CO₂ EMISSIONS

- ⇒ **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



(1) Direct CO₂ emissions (scope 1 in total), excluding life cycle analysis (LCA) of generation plants and fuel

EDF's INVOLVEMENT IN CCUS

Mainly focused on CO₂ Capture

Involvement in several EU projects CESAR-CLEO, HiPerCap, ENOS, Amélie-CO₂, DALMATIEN, OCTAVIUS, RELCOM, SUCCESS, H₂IGCC, **and in UK** : OXYCOAL ,.....

Member of EPRI's CCS program and (and carrying out a study for EPRI)

Involvement in several French projects

Operating 2 test Laboratories (rock/CO₂ interaction, solvent degradation + theses)

Financing of several theses in France and China

Club CO₂ Secretariat and Chair of the French mirror commission for standardization on CCS (ISO TC265)

CO2 CAPTURE PILOT PLANT

- ❖ Implemented on Le Havre power plant (slip stream from coal-fired unit 4).
- ❖ 1 ton of CO₂ captured per hour.
- ❖ Alstom's AAP (Advanced Amine Process) featuring the latest generation process configuration (Advanced Flow Scheme) based on Dow Chemical's amine solvent UCARSOL FGCTM 3000.
- ❖ 22 M€ budget with 25% public funding by ADEME.
- ❖ 1900 tons captured from July 2013 to March 2014.

- ❖ Thermal performance of 2.3-2.4 GJ/t CO₂ at 90% capture rate consistently demonstrated.
- ❖ Good thermal and chemical stability of the solvent.
- ❖ Consistently low ammonia emissions.
- ❖ Low gaseous amine emissions.





**THANK YOU FOR
YOUR ATTENTION
and
HAVE A NICE
MEETING**



CSLF Technical Group Meeting 2019 – November 4th and 5th Chatou - France