



# ON THE ROAD TO CARBON NEUTRALITY

**EDF VIEWS & INITIATIVES  
« MADE IN EUROPE »**

IEEJ & EU-Japan Center for Industrial Cooperation  
July 9th, 2021



# EDF GROUP 2020 KEY FIGURES

➤ **Sales: €69bn** **€14 billion** investment

➤ **120.5GW<sup>(1)</sup> installed capacity**

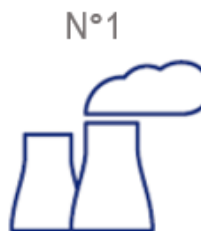


➤ **501.9TWh electricity output<sup>(2)</sup>**



➤ **165,200 employees**

**90%**  
Generation with no CO<sub>2</sub>



Nuclear operator in the world

Top 2



European producer of renewable energies

**50% of our business in France, 40% in the rest of the EU and 10% worldwide**

**39 million** customer sites worldwide

N°1



Electricity supplier in Europe

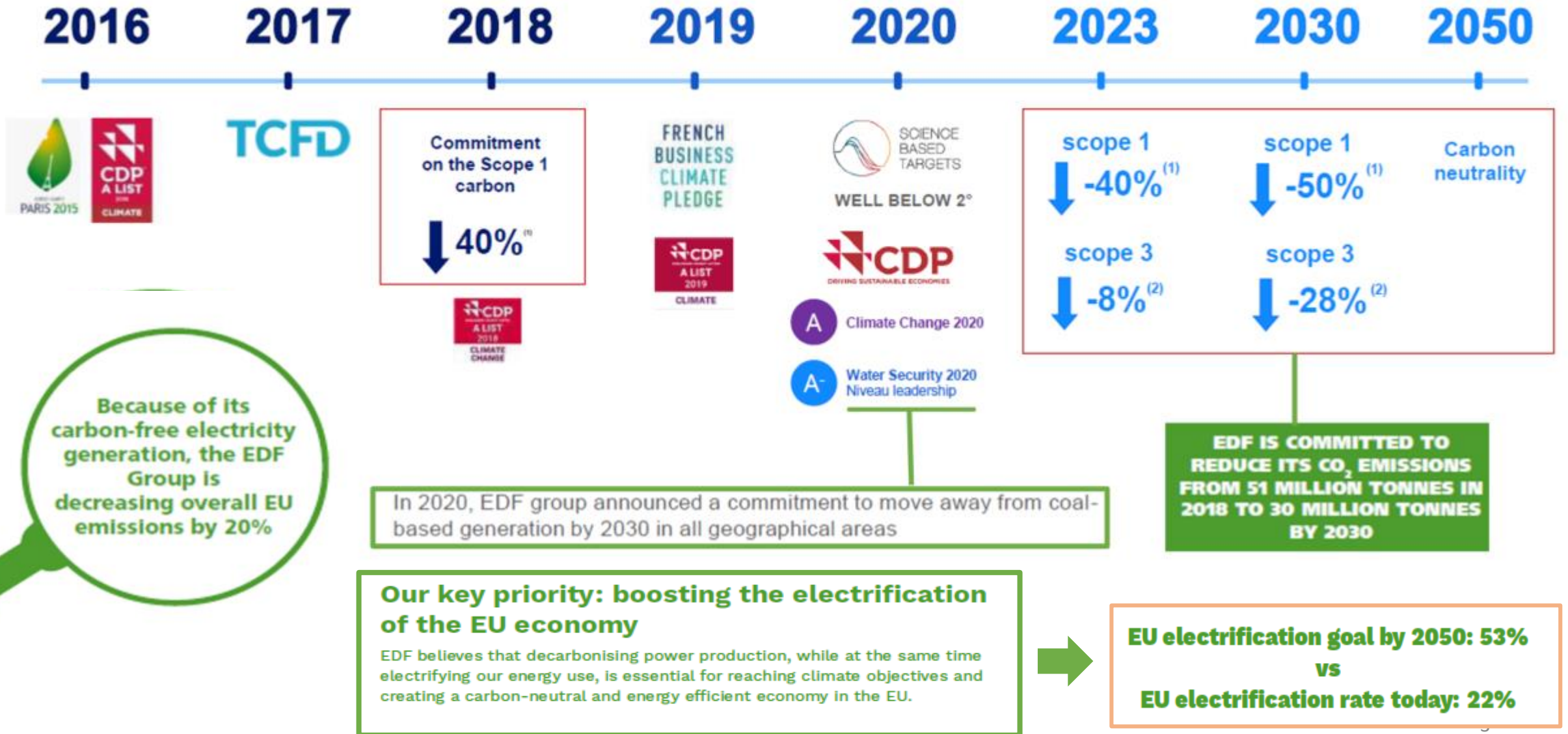
Top 3



European market leader in energy services

# WORLD LEADER IN LOW-CARBON ELECTRICITY GENERATION

A look back at 5 years of commitments



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

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

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

€**10bn** revenues IN SERVICES <sup>(3)</sup>

> **1.5** CONTRACTS/CUSTOMER <sup>(2)</sup>

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

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

**60GW NET,**  
>**x2** NEW RENEWABLES CAPACITIES (INCL.HYDRO) VS. 2015

INITIATING NEW  
**EPRs & 1 SMR**

An international key player in the energy transition

**EXIT** COAL

**1.5-2GW NET**  
HYDRO INSTALLED CAPACITY<sup>(4)</sup>

**1 MILLION**  
OFF GRID KITS

... supported by the implementation of 3 new Plans :



- N°1 electricity supplier for electric vehicles
- N° 1 charging network operator
- Leader in smart charging



**SOLAR POWER PLAN**  
**30 GWC OF SOLAR POWER CAPACITY**  
**WITH PARTNERS IN FRANCE BY 2035**

**ELECTRICITY STORAGE PLAN**

**10 GW of new storage capacity worldwide with €8 billion of investment by 2035**

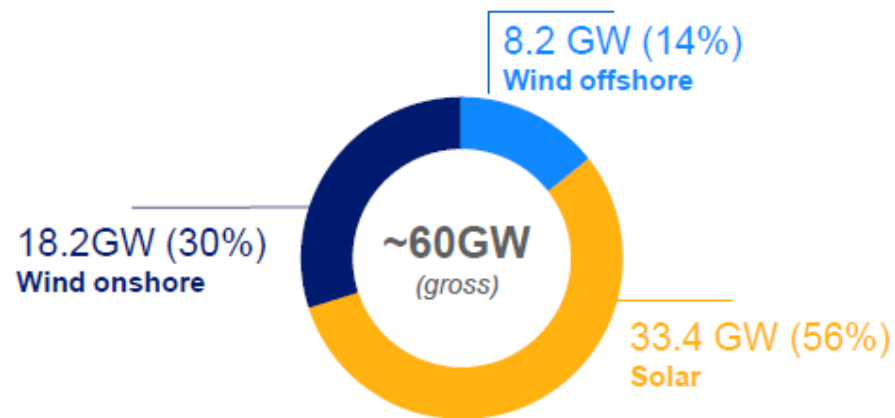


# A PORTFOLIO OF WIND AND SOLAR PROJECTS OF ~ 60GW (1)

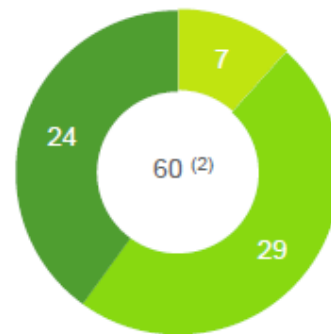
A PROJECT PORTFOLIO THAT IS **DIVERSIFIED GEOGRAPHICALLY...**



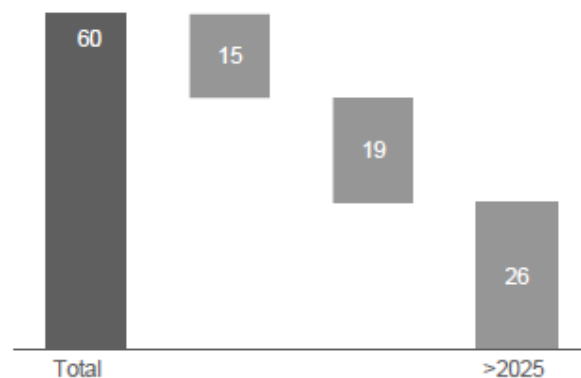
... AND **BALANCED BETWEEN WIND AND SOLAR**



Portfolio of projects (2) in GW



Pipeline breakdown by date of start of construction in GW (3)



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

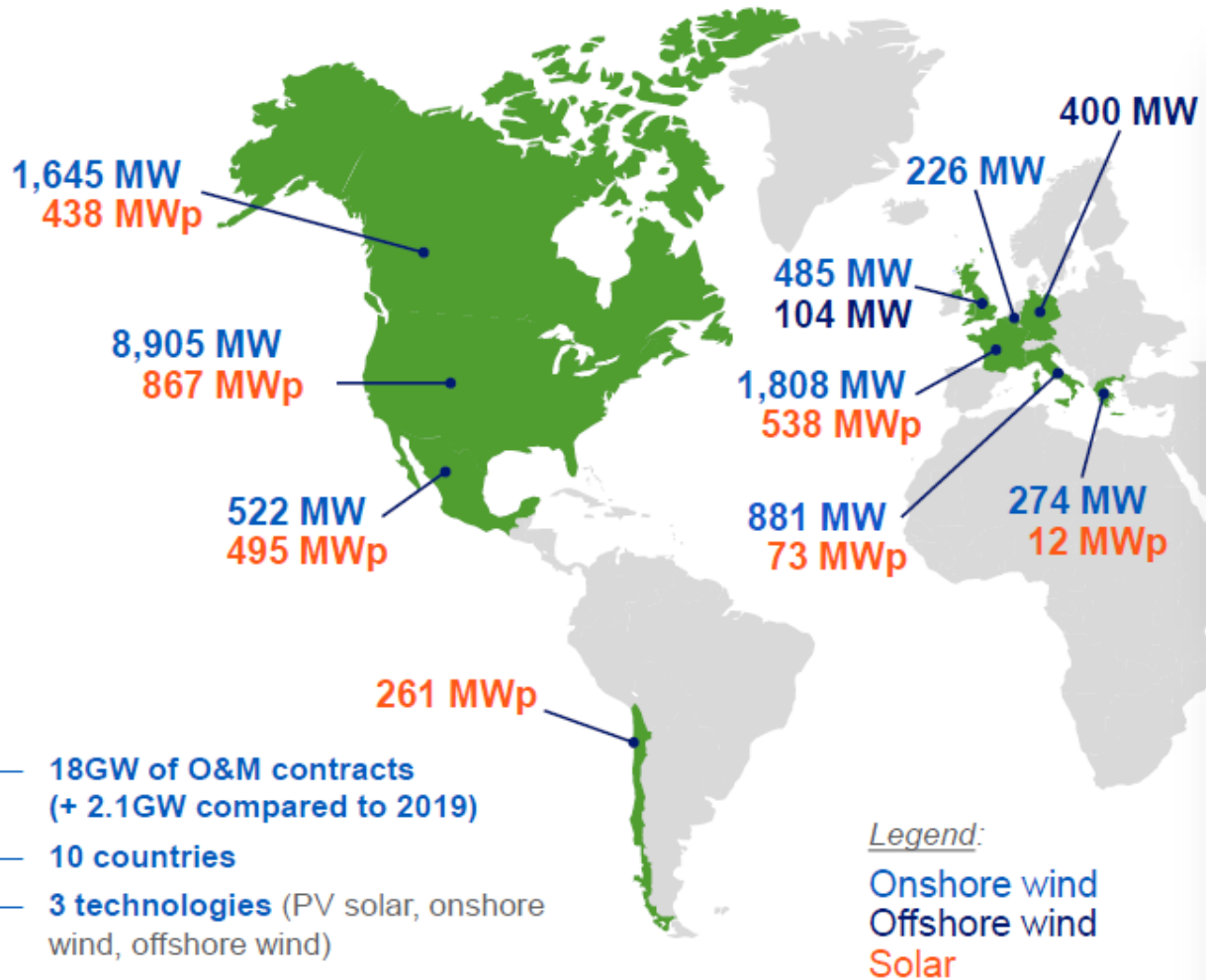
(2) All the projects in prospection phase included in the pipeline, starting 2020

(3) 2020 portfolio start of construction potential, not probability-based

- Secured \*\*\*
- Under development \*\*
- Prospection phase \*

\* Start of land identification and preliminary studies  
 \*\* Sufficient land securitisation and start of technical studies  
 \*\*\* Securing a power purchase agreement (following a call for tenders, auction, OTC negotiation)

# ~ 18GW OF O&M: STRONG EXPERTISE, DIFFERENTIATING FACTOR



**OPTIMISED ASSET PERFORMANCE**

- Digitalisation and supervision in real time, continuous innovation and predictive maintenance
- Ongoing data lake creation for asset performance optimisation

**ENHANCED TECHNICAL EXPERTISE**

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

**REINFORCED COMPETITIVENESS DURING THE DEVELOPMENT PHASES**

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

- 18GW of O&M contracts (+ 2.1GW compared to 2019)
- 10 countries
- 3 technologies (PV solar, onshore wind, offshore wind)
- Remote control and optimisation in real time via a state-of-the-art operations control centre and technical teams in the field

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

# INVESTING IN A WIDE SET OF FLEXIBLE SOLUTIONS

**95%**  
of the budget  
dedicated to  
**decarbonisation &  
energy systems'**  
transition

## Storage

Tests and studies on pre-commercial products & innovations (including 2nd life); field tests & derisking (MASERA, EDF Lab Concept Grid).

Lab testing (cells, modules) for performance assessment, aging models, post mortem analysis...

**zinium**

The EDF's spin-off **Zinium** develops a metal-air battery that uses oxygen from air and water to generate electricity, primarily for stationary applications.

## Electric Mobility

**pod POINT**



➤ **CHARGING STATIONS**

**izivia**  
GROUPE EDF

Electric mobility at home and when traveling with the Izivia Pass

**dreev**  
GROUPE EDF

In 2019, EDF launched **DREEV** to develop solutions based on Vehicle-to-Grid (V2G) technology. Smart management of charging and discharging car batteries establishes a balance between supply and demand, creating a value which is shared with customers.

**agregio**  
GROUPE EDF

is a virtual connected platform to coordinate the generation, consumption and storage of green energy in real-time. Agregio is contributing to the rise of renewable energy by supporting market producers and by providing visibility for investors.

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

**EDGi**  
REAL-TIME ACCESS TO ENERGY MARKETS

EDGi\* is a platform that enables you to view real-time energy asset data, market pricing, invoices and how your asset is interacting with the wholesale markets. Its customizable reports and data provide insight into an asset's performance which helps you make optimisation decisions. EDGi is also available as a mobile application.

## Digital & trading tools

**VENTEEA**  
SMART GRID FOR WIND ENERGY

The Venteea project (France) aims to integrate renewable energies into the grid in an economically and technically efficient manner. The EDF's power distribution subsidiary in France has developed new and innovative equipment and software and studied storage solutions as a means of stabilising the network.

➤ **OFFSHORE WIND POWER**  
Development of multi-physical modelling tool for eliminating risks in the design of offshore wind turbines

**Flexibility**  
Respond to needs for electricity flexibility and the energy transition by shrinking our carbon footprint and developing innovative solutions

## Renewables integration

**NICE GRID**  
A SMART SOLAR CITY

The Nice Grid project (France) is a smart solar neighbourhood with 1,500 customers using smart meters. The EDF's power distribution subsidiary in France is working there to fine-tune its expertise in demand response and storage solutions to better manage consumption peaks and the numerous distributed solar generation units in use.

**McPhy**

**Hydrogen**

**H<sub>2</sub>**

In 2018, EDF invested €16 million in **McPhy**, a key step aimed at developing low-carbon hydrogen in France and internationally.

**hynamics**  
GROUPE EDF

**H<sub>2</sub>**

In 2019, EDF launched **Hynamics**, its business line offering low-carbon hydrogen for industry and heavy transport. Hynamics installs, runs and maintains hydrogen production facilities.



**H<sub>2</sub> H2SHIPS** is a project for the industrialisation of hydrogen solutions for river and sea transport. Use cases are: river passenger transport in Paris, river freight in Amsterdam and seagoing maintenance operations of offshore wind turbines in Ostend.

# EXPLORING NEW BUSINESS MODELS FOR THE ENERGY AND DIGITAL TRANSITION

INVESTMENTS MADE BETWEEN SEPTEMBER 2017 AND DECEMBER 2020



**SUSTAINABLE TERRITORIES**



## A 3D TOOL FOR URBAN PLANNING

EDF has developed a 3D urban simulation platform that is being used by the Housing and Development Board in Singapore to build investment scenarios around concepts like energy efficiency, renewable energy development, smart grids, greening and mobility and evaluate their impact on energy consumption, CO<sub>2</sub> emissions, the environment and costs.



**PRODUCTION-TOOL PERFORMANCE**



**Metroscope** offers an automatic and reliable diagnosis of industrial installations to identify, in real-time and with great precision, a hazard affecting its industrial process and likely to generate a loss of production, a lasting deterioration of a component or even shutdowns. #Tech4Climate

**5** strategic areas

- Smart Cities
- Smart Home
- Energy Cloud
- The company of the future
- Energy Efficiency

**Over 15** strategic venture capital funds

**Over 20** start-up collaborations and creations



**SERVICES FOR RESIDENTS**



The control of heating, air quality, the charging station of the electric vehicle, etc. by voice and by touch



In France, the **Sowe** home automation solution is a connected station combined with energy contracts to provide a suite of services (smart thermostat, weather, air pollution, travel time for work) to residential customers.



**DECENTRALISED ENERGY SYSTEMS**



**EDF Store & Forecast** is a spin-in company which develops and sells software solutions to forecast, plan and optimise real-time control for renewable energy production combined with energy storage and load shedding.

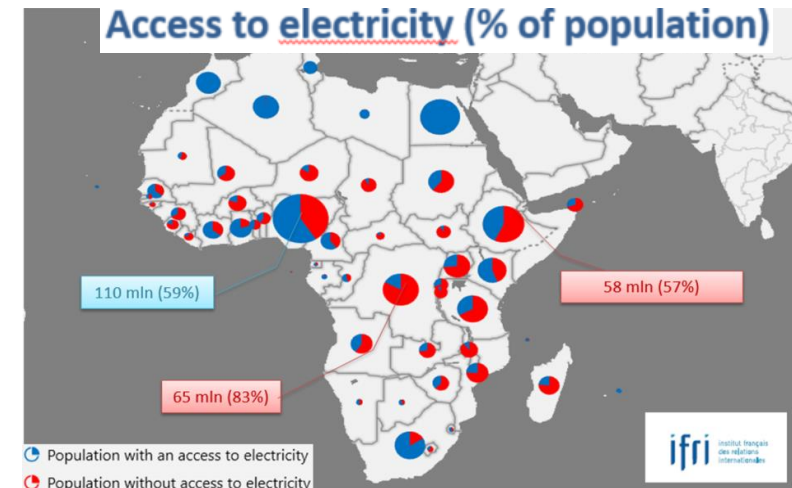


# WHAT NEXT ?

## BUILDING BRIDGES BETWEEN EUROPE & JAPAN, INCLUDING OVERSEAS DEVELOPMENTS

1. OFFERING OUR SET OF LOW-CO2 SOLUTIONS TO 1/3 COUNTRIES COMMITTED TO DECARBONIZE, IN COOPERATION WITH JAPANESE COMPANIES (SHOSHAS & UTILITIES )
2. PARTNERING IN RENEWABLES PROJECTS (WIND OFFSHORE, HYDRO...) IN THE INDO-PACIFIC REGION
3. INVESTING JOINTLY IN NEW BUSINESSES AND FUNDS TO PREPARE THE FUTURE
4. PUTTING CARBON PRICING AS A PRIORITY ON A REALISTIC « EU-JAPAN AGENDA » IN ORDER TO DELIVER A STRONG AND PREDICTABLE SIGNAL TO NEW SUSTAINABLE INVESTMENTS
5. CONTRIBUTING TO A GROWING ACCESS TO ELECTRICITY IN TARGETED COUNTRIES

1/2 of Sub-Saharan population has no access to electricity,  
700 million of people worldwide without clean cooking





**THANK YOU**

