



# EDF RENEWABLES

A GLOBAL LEADER IN  
RENEWABLE ENERGY

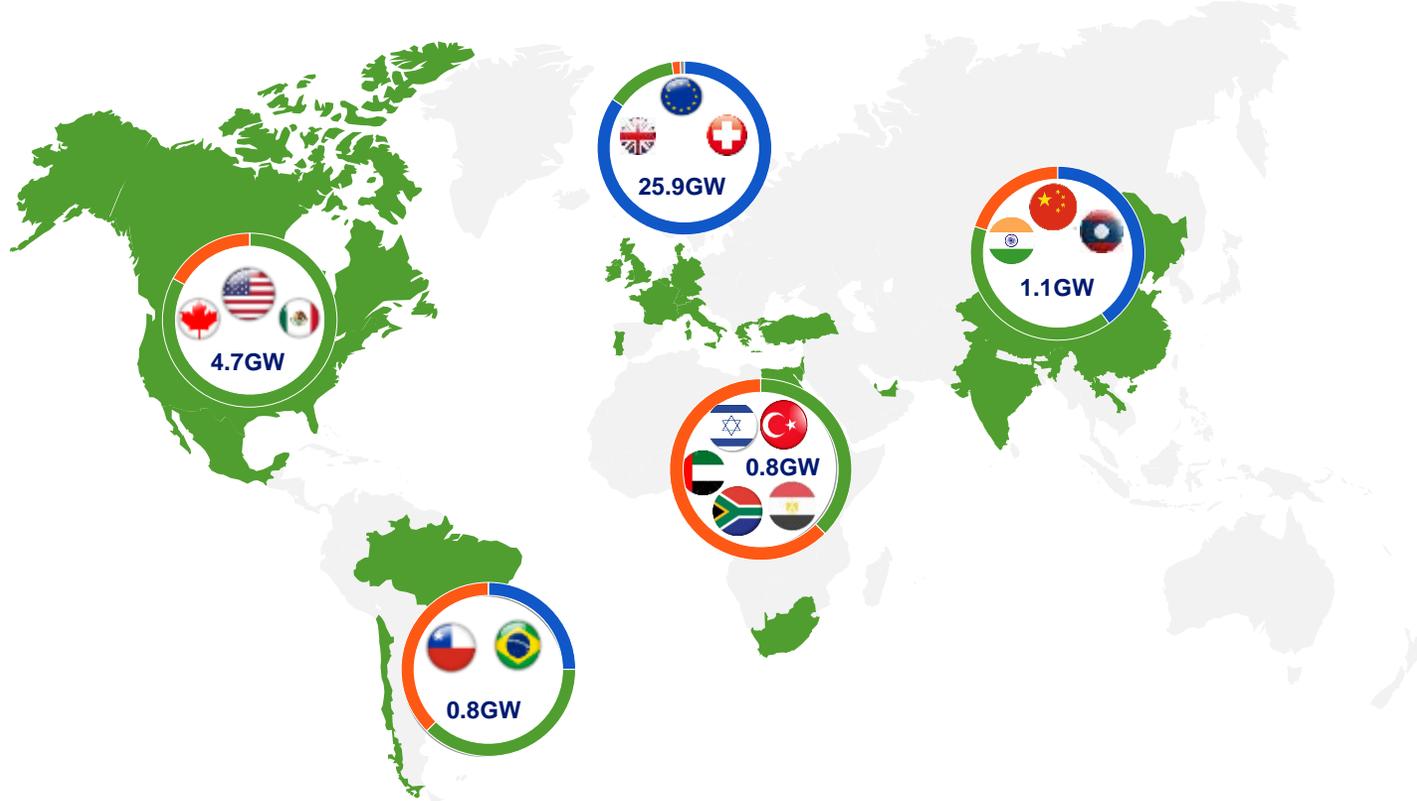
**Bruno Bensasson**

EDF Senior Executive Vice-President, Renewable Energies Chairman  
and Chief Executive Officer of EDF Renewables

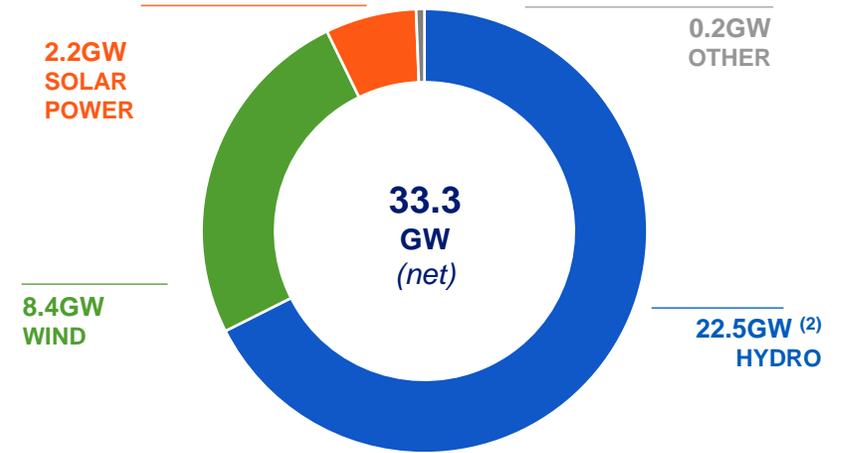
March 2021

# EDF, THE EUROPEAN LEADER IN RENEWABLE ENERGIES

NET INSTALLED CAPACITY: 33.3GW <sup>(1)</sup>



## CAPACITY BY SECTOR



- (1) Installed capacity shown as net, corresponding to the consolidated data based on EDF's participation in Group companies, including investments in affiliates and joint ventures
- (2) Including sea energy: 0.24GW

# RENEWABLES: GOOD RESULTS IN SPITE OF THE PANDEMIC CRISIS

| EDF RENEWABLES               |              |            |              |                           |
|------------------------------|--------------|------------|--------------|---------------------------|
| In €m                        | 2019         | 2020       | Δ%           | Δ%<br>Org. <sup>(1)</sup> |
| <b>EBITDA</b>                | <b>1,193</b> | <b>848</b> | <b>-28.9</b> | <b>-23.0</b>              |
| <i>o/w generation EBITDA</i> | <i>917</i>   | <i>904</i> | <i>-1,4</i>  | <b>+4.7</b>               |

- **Covid-19 effects non-material**
- **Lower DSSA** activity contribution: exceptional level in 2019 linked to the partial disposal of an offshore farm in Scotland
- **Electricity output:** 15.4TWh, generating an organic increase in EBITDA of 4.7% thanks especially to additional capacities commissioned at end-2019 and in 2020
- Growth in the Distributed Solar & Operation / Maintenance activities
- Increase in development efforts supporting business growth

| GROUP RENEWABLES <sup>(3)</sup> |              |                |              |                           |
|---------------------------------|--------------|----------------|--------------|---------------------------|
| In €m                           | 2019         | 2020           | Δ%           | Δ%<br>Org. <sup>(1)</sup> |
| <b>EBITDA <sup>(3)</sup></b>    | <b>2,166</b> | <b>1,862</b>   | <b>-14.0</b> | <b>-12.3</b>              |
| <b>Net investments</b>          | <b>(404)</b> | <b>(1,311)</b> | <b>x3.2</b>  |                           |

- **EBITDA**
  - **Hydro France:** hydro generation growth of 5.1TWh <sup>(2)</sup> (+15.3% vs 2019). Unfavourable effect of market spot prices conditions (-€7.3/MWh) <sup>(3)</sup>
  - **RE:** Full year effect of commissionings
- **Net investments**
  - Very sharp increase in net investments in the absence of significant disposal transaction



**GROUP RENEWABLES RECORD LEVEL OF PROJECTS UNDER CONSTRUCTION TO 8GW GROSS AT END-DECEMBER 2020 (2.5GW WIND, 1.6GW OFFSHORE WIND, 3.9GW SOLAR)**

(1) Organic change at comparable scope, standards and exchange rates. The gap with non-organic growth reflects intra-group assets transfers.

(2) Hydro generation after deduction of pumped volume consumption

(3) For the optimised renewable electricity generation activities within a larger portfolio of generation assets, in particular relating to France's hydropower fleet, sales and EBITDA are estimated, by convention, as the valuation of the output generated at market prices (or the purchase obligation tariff), without taking into account hedging effects, and taking into account the valuation of the capacity, if applicable.

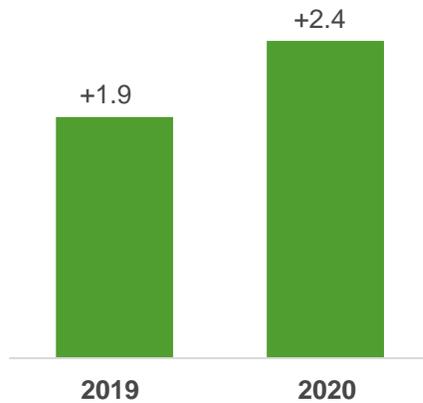
# RENEWABLES: STRONG ACCELERATION IN GROWTH (1/3)



1

## HIGH LEVEL OF COMMISSIONING

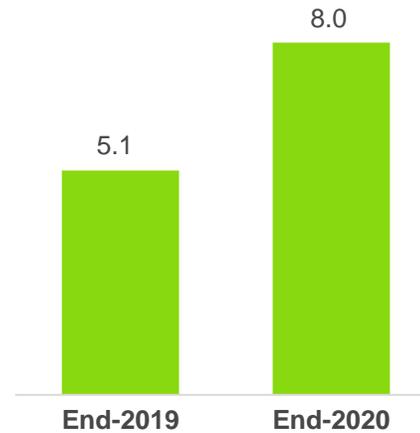
Capacity commissioned <sup>(1)</sup>  
(GW gross)



2

## SHARP INCREASE IN CAPACITY UNDER CONSTRUCTION

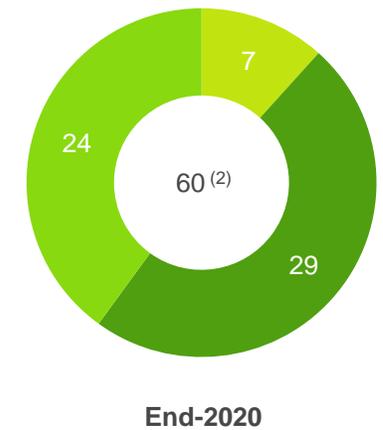
Capacity under construction at year-end <sup>(1)</sup>  
(GW gross)



3

## A LARGE PIPELINE

Pipeline of projects under development <sup>(1)(2)</sup>  
(GW gross)



■ Prospection phase <sup>(3)</sup> ■ Under development <sup>(4)</sup> ■ Secured <sup>(5)</sup>

(1) Wind and solar capacities.

(2) Pipeline excluding capacity under construction. All the projects in prospection phase included in the pipeline, starting 2020

(3) Start of land identification and preliminary studies

(4) Sufficient land securitisation and start of technical studies

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



## OFFSHORE WIND ACHIEVEMENTS

### Construction launches in France ~1GW

- Fécamp, 500MW, commissioning planned for 2023
- Courseulles-sur-Mer, 450MW, commissioning planned for 2024

### First projects in China ~500MW

302MW in operation and 200MW under construction

### Other construction in progress ~1GW

- Saint-Nazaire, 480MW, France, commissioning planned for 2022
- Nearth-Na-Gaoithe, 450MW, Scotland, commissioning planned for 2023

Development of a 1GW project in Ireland

## STRENGTHENING IN ONSHORE WIND

Commissioning of 1.4GW (o/w 1GW in the USA)

Construction launch of a 400MW wind farm in Saudi Arabia (commissioning planned in 2022)

## ACCELERATION IN SOLAR

### Major successes

2GW in the United Arab Emirates, the world's largest solar project to date

1.3GW in India

~200MW in France

### Commissioning of ~1GW

400MW in the United Arab Emirates,

500MW in the USA

Acquisition of a **4.5GW pipeline of projects** in the USA

### SOLAR PLAN IN FRANCE



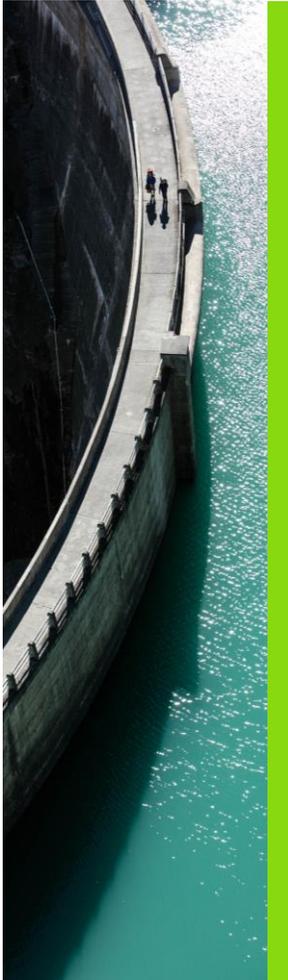
~2.5GW of ground-based projects in development at end-2020

~0.5GW of secured projects at end-2020

~0.3GW under construction at end-2020

Construction launch for the first floating photovoltaic power plant

CRE tender # 4.8: **market share of ~30% reached**



## IMPLEMENTATION OF THE STORAGE PLAN

### CONSTRUCTION OF 100MW IN THE UNITED KINGDOM

First two projects<sup>(2)</sup> of Pivot Power

### SIGNATURE OF A PPA FOR A 180MW STORAGE SYSTEM PROJECT IN THE USA

Chuckwalla: Storage system<sup>(3)</sup> coupled with a 200MW solar power plant, to deliver 180MW over four hours

### TENDER AWARDED FOR 90MW IN ISRAEL

Storage systems<sup>(3)</sup> coupled with 230MW solar projects, to deliver 90MW over four hours

### COMMISSIONING IN FRANCE

Toucan 2, photovoltaic plant coupled with a smart storage system<sup>(3)</sup> in French Guiana

**~ 1GW PROJECTS BUILT OR SECURED AT END-2020**

LE PLAN  
**stockage**  
électrique

## DEVELOPMENT IN HYDRO POWER

### MODERNISATION OF ROMANCHE-GAVET PLANT IN FRANCE

Commissioning of the new power plant (97 MW) and power output increased by 40%

## INTERNATIONAL HYDRO POWER

### PROJECTS AND POWER PLANT CONSTRUCTIONS

**Nachtigal construction** (420MW) in Cameroon, nearly 37% of the civil engineering work carried out, consortium including EDF (commissioning planned in 2024)

**Mpatamanga project** (350MW) in Malawi: prequalification of the consortium including EDF, as exclusive developer

### ENGINEERING ASSISTANCE FOR PSHP<sup>(1)</sup> PROJECTS

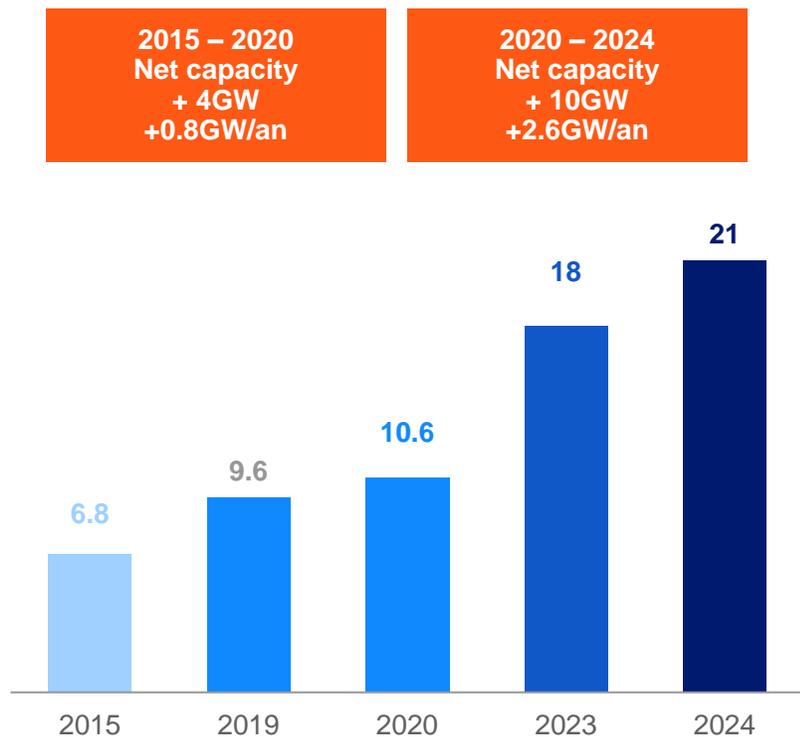
**Hatta** (250MW) in United Arab Emirates: construction kicked-off, supervised by EDF

(1) Pumped-storage hydropower plant.  
(2) Storage for network services  
(3) Storage for generation optimisation

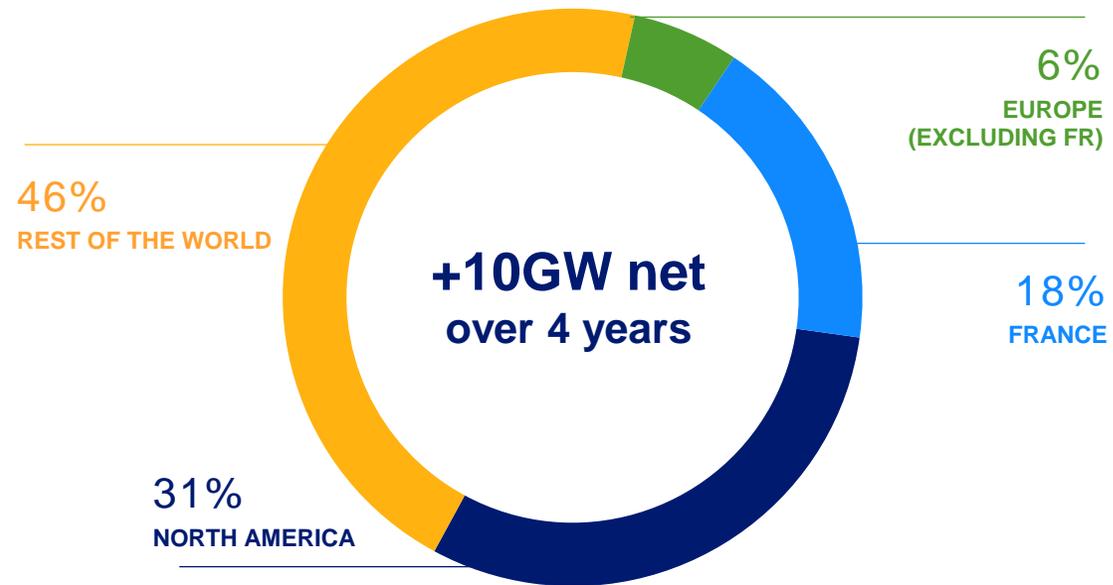
# BALANCED ACCELERATION ACROSS GEOGRAPHIES AND TECHNOLOGIES

NB: This financial communication contains forward-looking data based on targets. Although management believes that this data is reasonable, investors are cautioned that such data is subject to numerous risks and uncertainties that could cause actual results and developments to differ materially from those expressed herein

2024 NET INSTALLED CAPACITY TARGET (GW) <sup>(1)</sup>



2020-2024 NET ADDITIONAL CAPACITY BY GEOGRAPHIC REGION (GW) <sup>(1)</sup>



2020-2024 NET ADDITIONAL CAPACITY BY TECHNOLOGY



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

# 2030 STRATEGIC TARGETS UPGRADE



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 (1)

**€10bn revenue** IN SERVICES (3)

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

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

**↘ 50%** CO<sub>2</sub> eq DIRECT EMISSIONS vs 2017  
VS 50GW NET (+10GW NET)

**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(4)

**1 MILLION**  
OFF GRID KITS

Scope: (1) Customers, Services & Territories sector's activities. EDF estimate, including CO<sub>2</sub> savings linked mainly to heating and cooling networks, the development of the electric vehicle and energy saving certificates; (2) EDF estimate: France, UK, Italy and Belgium (Residential); (3) Group; (4) Excluding priority countries in Europe (France, Italy, UK and Belgium)

# ANTICIPATING AND SEIZING NEW TRENDS WILL BE A CRITICAL SUCCESS FACTOR TO CREATE DURABLE VALUE



New Route to Market opportunities : growing **merchant exposure** and **corporate PPAs market**



**Technological improvements:** digital optimization, bifacial modules, floating offshore/PV, Agri-PV etc.



Emergence of **storage and green H2** to complement renewable energy sources, hybrid projects



**Microgrids** for off grid users or users with poor connection, also including distribution



Making the most of these new trends from an **early stage** will be a precious asset for value creation



# EDF RENEWABLES

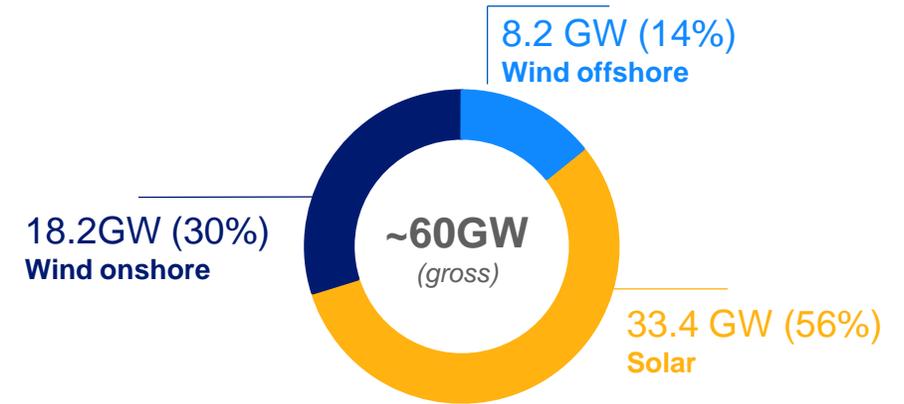
APPENDICES

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

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

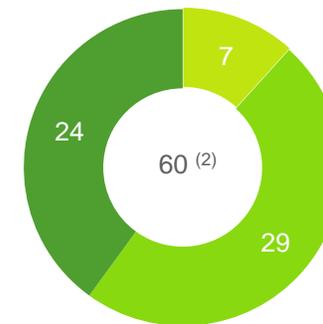


... **BALANCED BETWEEN WIND AND SOLAR...**

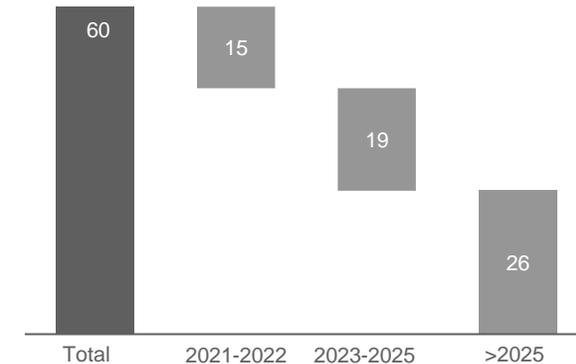


... and also **BALANCED IN TERMS OF MATURITY STAGE...**

Portfolio of projects (2) in GW



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

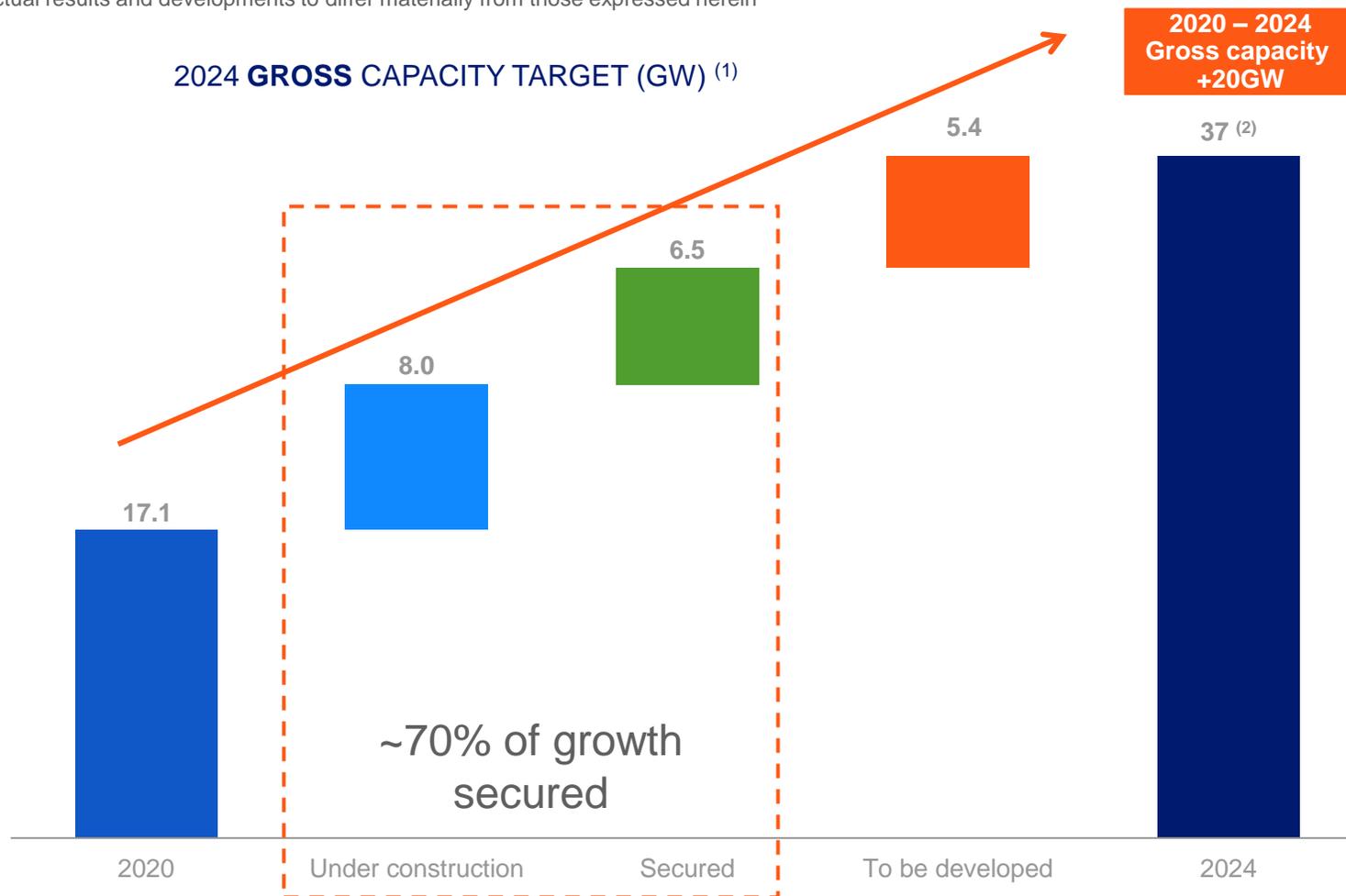


(1) Pipeline excluding capacities under construction. Gross data corresponding to 100% of the capacity of the projects concerned.  
 (2) All the projects in prospection phase included in the pipeline, starting 2020  
 (3) 2020 portfolio start of construction potential, not probability-based

■ 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)

# STRONG GROWTH EXPECTED THANKS TO MORE THAN 14GW OF PROJECTS ALREADY SECURED

NB: This financial communication contains forward-looking data based on targets. Although management believes that this data is reasonable, investors are cautioned that such data is subject to numerous risks and uncertainties that could cause actual results and developments to differ materially from those expressed herein



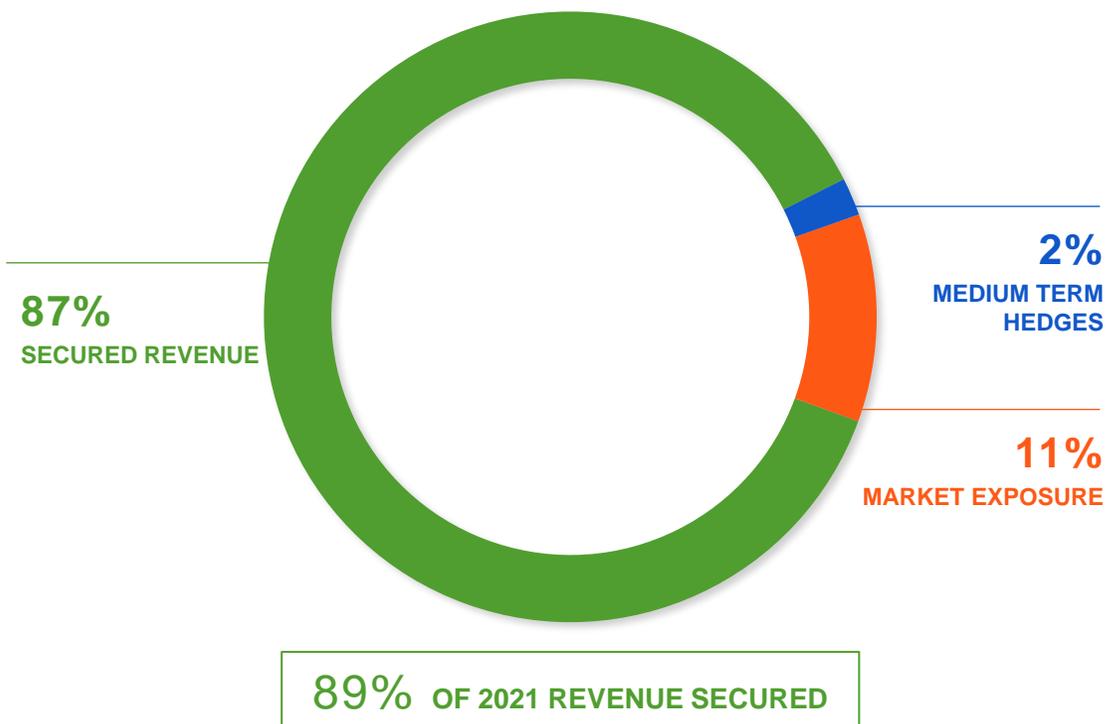
NB: situation at end-2020

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

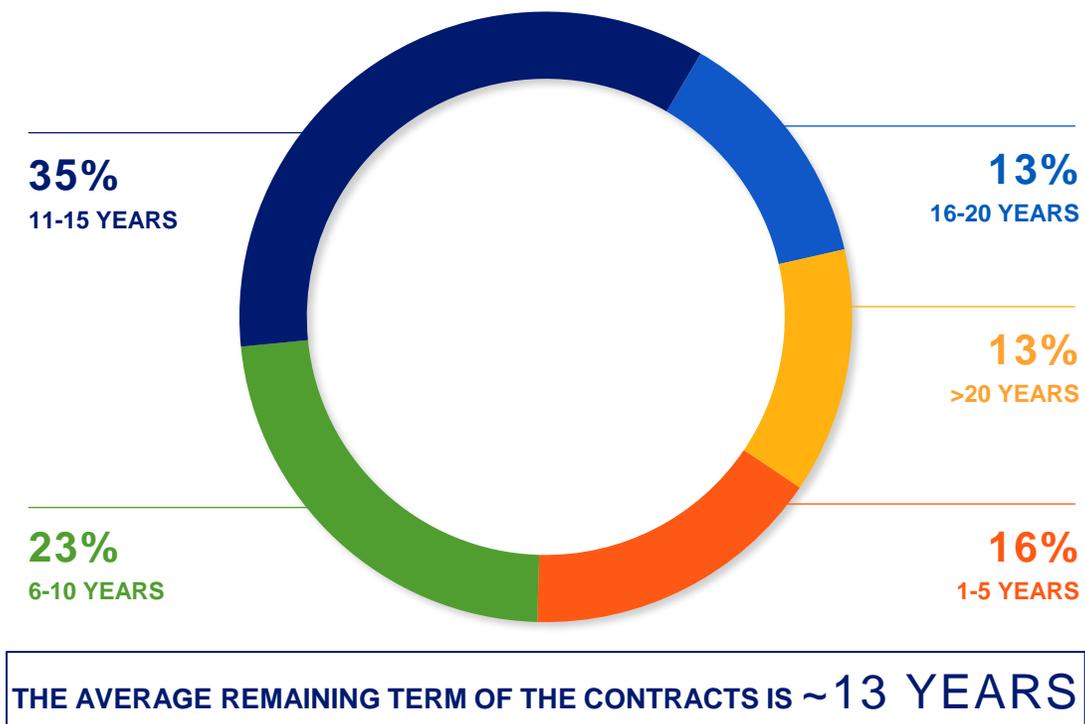
(2) As a reminder, the 2023 objective fixed in 2019 was 32.4GW, raised in 2020 at 33.5GW

# REVENUE SECURED BY LONG-TERM CONTRACTS

**CONTRACTUALISATION OF 2021 CONSOLIDATED REVENUE FROM RENEWABLE GENERATION (in %) <sup>(1)</sup>**



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



(1) Based on the estimate of 2021 revenues from fully consolidated assets

(2) Weighting according to estimated 2021 revenues of fully consolidated assets

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

Ongoing construction of **Saint Nazaire offshore wind farm** (started in 2019, expected commissioning in 2022, ~€2bn total investments, partnership with Enbridge)

**MAJOR ACHIEVEMENTS IN 2020 and Q1 2021:**

- **Fécamp offshore wind farm**
  - Start of construction in June 2020
  - Expected commissioning in 2023
  - ~ €2bn total investment, partnership with Enbridge and WPD
- **Courseulles-sur-Mer offshore wind farm**
  - Start of construction in February 2021
  - Expected commissioning in 2024
  - ~ €2bn total investment, partnership with Enbridge and WPD

**Further developments:**

- Ongoing development of **Dunkirk offshore wind farm** (~1bn€ total investment): public consultation in H2 2020

Development in progress of **Provence Grand Large, a floating wind pilot project**: contract awarded to EDF Renewables for the installation of three 8MW turbines on floating foundations off the coast of Fos-sur-mer



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

 **Codling project in Ireland**

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

 **Neart Na Gaoithe project in Scotland**

- **Start of construction in 2019**
- **Total capacity: 450MW** (54 turbines)
- Commissioning scheduled for 2023
- Partnership with the Irish utility **ESB at 50%**
- Total investment: **~£2bn**
- Contract for Difference (CfD) over 15 years (£114.39/MWh in 2012£)

 **Atlantic Shores project in the United States**

- Ongoing developments off the coast of New Jersey
- Joint-venture with Shell
- Secured a 742 km<sup>2</sup> Lease Area 12-16 km off the shoreline in shallow water depth (~20m)
- **New Jersey RFP bid submitted on 10 December 2020 for a maximum of 2.3GW**

 **Dongtai IV and V projects in China**

- **Joint-venture with China Energy Renewables (ex-shenhua Renewables)**, a subsidiary of China Energy Investment Corporation
- Total capacity: **502MW** (Dongtai IV: 302MW, Dongtai V: 200MW)
- **Commissioning of Dongtai IV in December 2019**, Dongtai V under construction (**commissioning planned for 2021**)

# THE FRENCH SOLAR PLAN



A STRONG ACCELERATION OF SOLAR PV DEVELOPMENTS

## TARGET

BE A LEADER IN FRANCE  
30% MARKET SHARE <sup>(1)</sup> BY 2035

## SOLAR PLAN WELL UNDER WAY



**c.2.5GW**

of grounded-based projects in development at end-2020

**x9**  
vs 2017



**c.500MW**

of secured projects at end-2020

**x11**  
vs 2017



**c.250MW**

under construction at end-2020

**x9**  
vs 2017



CRE tender 4.8 : market share **of ~ 30%** reached

(1) Market share expressed as installed gross capacities

# ELECTRICITY STORAGE PLAN (1)

## TARGET

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



## ACHIEVEMENTS AND PROJECTS

**A PORTFOLIO OF COMPLETED OR SECURED PROJECTS HAVING INCREASED BY OVER 58% IN 2020 TO A TOTAL 950MW AT END-DECEMBER 2020**

Results in line with the initial trajectory of the Electricity Storage Plan

The results in 2020 benefited from the contribution of major large scale projects:

- Signature of the Chuckwalla PPA (Nevada): storage system coupled with a 200MW solar power plant, to deliver 180MW over four hours
- Construction of the first two Pivot Power projects (UK) : 2 x 50MW
- Winner of the PV + storage tender in Israel: storage systems coupled with 230MW solar projects, to deliver 90MW over four hours

## INVESTMENTS TO PREPARE FOR THE FUTURE:

- Acquisition of a stake in Ecosun (PV containers + storage, plug-in ready) to address the small-scale microgrid segment
- Participation in the capital increase of start-up PowerUp to develop assessment and optimisation services for stationary batteries
- Commissioning of the post-mortem battery analysis R&D lab

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

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

# AL DHAFRA PROJECT: CURRENTLY THE WORLD'S LARGEST SOLAR PROJECT (2GW) AWARDED TO EDF-JINKO CONSORTIUM

## 2020 achievements :

- **July** : EDF Renewables and Jinko Power have been awarded the Al Dhafra solar project in Abu Dhabi (UAE) by EWEC (Emirates Water and Electricity Company)
- **December** : Financing secured

## Al Dhafra project key features

- Location: 35km south of Abu Dhabi City.
- Capacity: 2GW (largest single-project solar plant in the world, equivalent electricity to power over 160,000 local households)
- Shareholding: Public-Private Partnership (PPP). EDF Renewables and Jinko Power will hold 20% each. The 60% remaining shares will be owned by TAQA and Masdar
- Technology: bifacial modules



# A SUSTAINABLE BUSINESS MODEL BASED ON KEY COMPETITIVE ADVANTAGES

## DEVELOPMENT

- **Key competitive advantages for the development of a strong project portfolio**
  - A large and diverse international presence with seasoned development and engineering teams (1300 employees<sup>(1)</sup>) teams in Europe and North America and dedicated development hubs in Asia Pacific, Latin America, Middle East North Africa
  - Expertise in site security, engineering, procurement, structured financial arrangements and participation in tenders
  - Key local partnerships in order to share investments, country risk and maximize competitive advantages
  - Strong portfolio, in renewal and with a good transformation rate (current construction rate at c.20%)
- **Synergies** within EDF for **customer-tailored solution** (PPAs for commercial and industrial customers, off-grid or decentralised offers)

## ENGINEERING & CONSTRUCTION

- **Strong engineering expertise**
- **Significant expertise in the construction of industrial-scale projects and operational excellence in delivering at budgets and deadlines**
- **Continued technical innovation** to seize opportunities in new markets (floating PV, floating offshore wind, etc.)

## O&M AND ASSET MANAGEMENT

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

## FINANCE

- Maximised value creation via **demanding investment policy, selective acquisition strategy and regular asset rotation approach**

**VALUE CREATION:**

**+150-200 bps**

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

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

(2) Historical average performance estimated as part of a profitability analysis of EDF Renewables projects (scope: 81% of installed capacity, 6.6GW net, 118 projects, 14 countries). The IRR calculation takes into consideration the various assumptions, in particular the evolution of market prices, excluding volumes and periods covered by the PPAs

# TECHNOLOGICAL INNOVATION: A KEY COMPETITIVE ADVANTAGE

## PHOTOVOLTAIC SOLAR

- **Increase the capacity of installations thanks to bifacial PV modules** (technology selected for Al Dhafra project – 2GW)
- **Unlock new potentials in solar PV in geographically constrained areas thanks to floating photovoltaic solar installations ...**
  - Beginning of the construction of the first floating photovoltaic power plant of 20MW in France (Lazer, Hautes-Alpes)
  - Winning a tender in Israel (50MW)
- **... and Agri-PV**
  - 1st co-developed pilot project with EDF R&D and INRA, in operation at EDF R&D center « les Renardières »
  - Signature of a charter with the FNSEA to develop and better supervise ground-based photovoltaic projects on agricultural lands in France

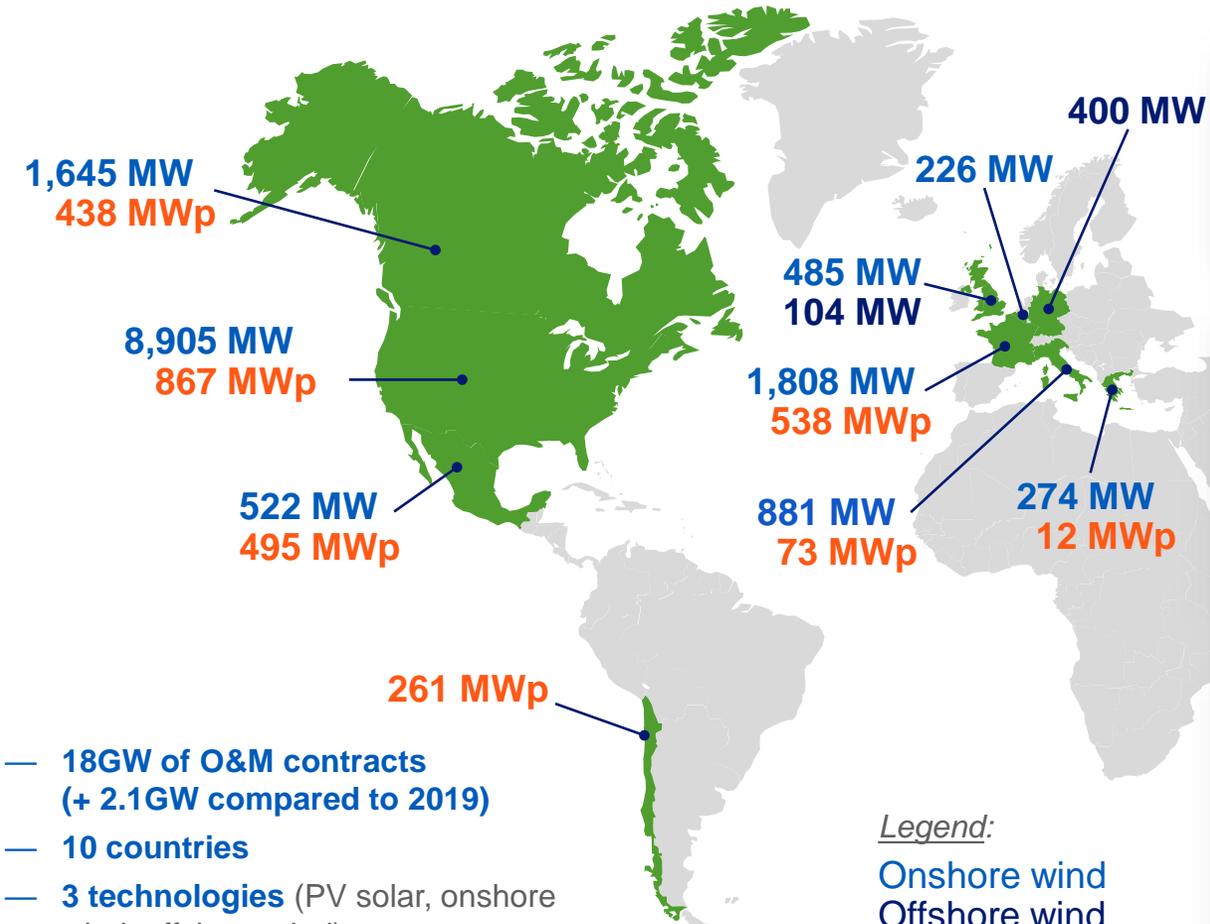
## OFFSHORE WIND

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

## STORAGE

- **Development of flexibility on the grid using Li-ion batteries coupled to generation assets:** Toucan 2, French Guyana (solar PV) and Chuckwalla, United States (solar photovoltaic)
- **Development of storage projects** (acquisition of Pivot Power in the UK in 2019, with 2 projects to be commissioned in Q1 2021) **and charging systems for electric vehicles** (acquisition of PowerFlex in the United States in 2019, installation of 2,500 EV charging stations in 2020)

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



- 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

*Legend:*  
 Onshore wind  
 Offshore wind  
 Solar

## OPTIMISED ASSET PERFORMANCE

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

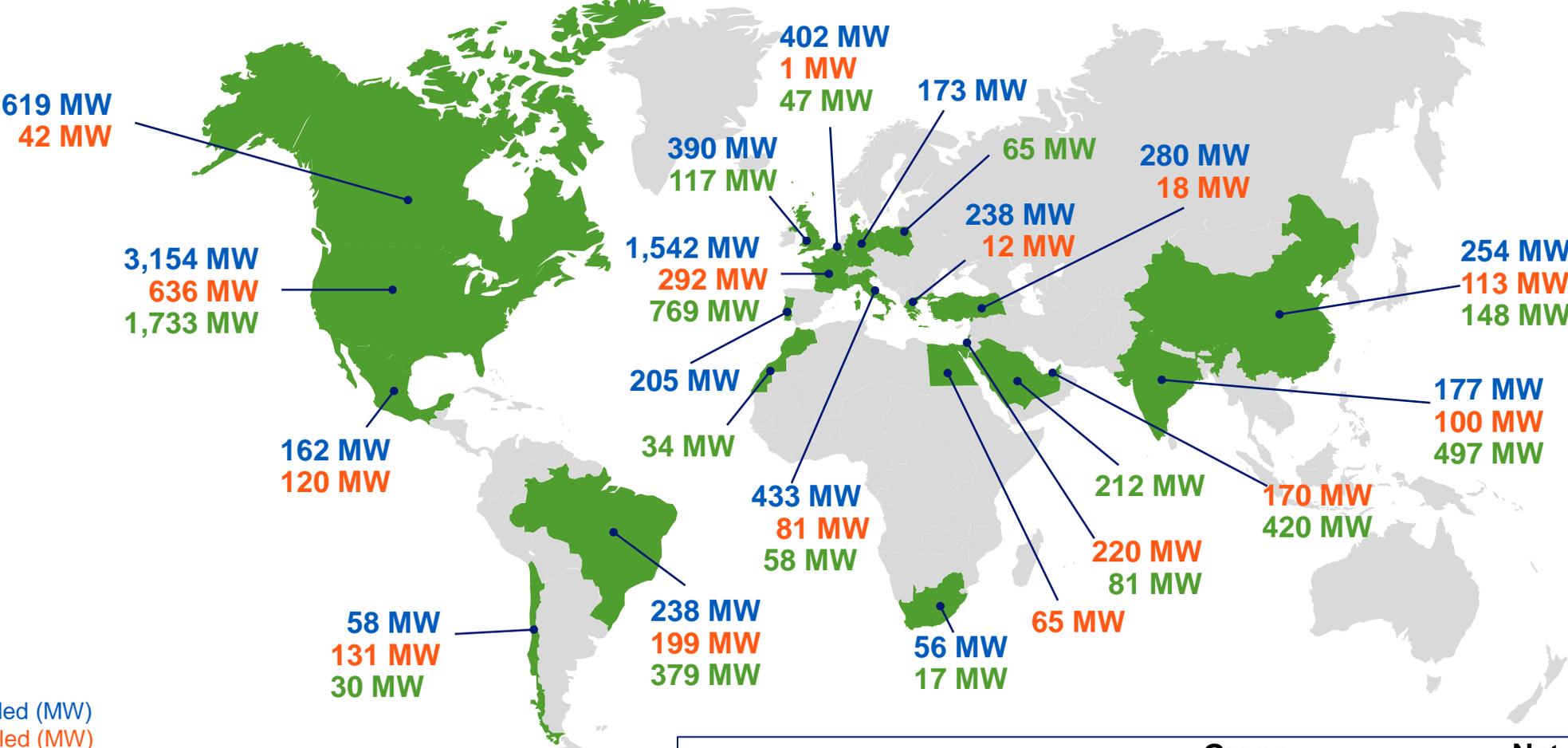
## ENHANCED TECHNICAL EXPERTISE

- 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.)

# NET INSTALLED AND UNDER CONSTRUCTION CAPACITY - 31 DECEMBER 2020



Legend:  
 Wind installed (MW)  
 Solar installed (MW)  
 Wind and solar under construction (MW)

|                             | Gross            | Net              |
|-----------------------------|------------------|------------------|
| Installed capacity          | 17,142 MW        | 10,578 MW        |
| Capacity under construction | 7,991 MW         | 4,608 MW         |
| <b>Total</b>                | <b>25,133 MW</b> | <b>15,186 MW</b> |

# INSTALLED CAPACITY AND CAPACITY UNDER CONSTRUCTION, WIND & SOLAR, AS OF 31 DECEMBER 2020

| <i>(in MW)</i>                           | <b>Gross <sup>(1)</sup></b> |                   | <b>Net <sup>(2)</sup></b> |                   |
|------------------------------------------|-----------------------------|-------------------|---------------------------|-------------------|
|                                          | <b>31/12/2019</b>           | <b>31/12/2020</b> | <b>31/12/2019</b>         | <b>31/12/2020</b> |
| Wind                                     | 12,416                      | 13,266            | 7,827                     | 8,379             |
| Solar                                    | 2,900                       | 3,876             | 1,750                     | 2,199             |
| <b>Total installed capacity</b>          | <b>15,316</b>               | <b>17,142</b>     | <b>9,577</b>              | <b>10,578</b>     |
| Wind under construction                  | 3,531                       | 4,126             | 2,131                     | 2,680             |
| Solar under construction                 | 1,525                       | 3,865             | 1,166                     | 1,928             |
| <b>Total capacity under construction</b> | <b>5,056</b>                | <b>7,991</b>      | <b>3,297</b>              | <b>4,608</b>      |

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

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

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