

**RIPUC DOCKET NO. 4574
REVIEW OF POWER PURCHASE AGREEMENT
COPENHAGEN WIND FARM, LLC
PURSUANT TO R.I. GEN. LAWS § 39-26.1-1 ET SEQ.
WITNESS: ROBERT CROWELL
ON BEHALF OF INTERVENOR COPENHAGEN WIND FARM, LLC
SEPTEMBER 11, 2015**

PRE-FILED DIRECT TESTIMONY

OF

ROBERT CROWELL

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1 **I. Introduction and Qualifications**

2 **Q. Please state your name and business address.**

3 A. My name is Robert Crowell. My business address is OwnEnergy, Inc., an EDF
4 Renewable Energy Company, 45 Main Street, Suite 536, Brooklyn, New York, 11201.

5
6 **Q. Please describe your general background and qualifications.**

7 A. I earned a Bachelor of Science degree in Civil Engineering from Rose-Hulman Institute
8 of Technology in 1984 and an MBA from Illinois State University in 1995. I have more
9 than 31 years of multi-discipline technical, construction, operating, and executive
10 experience in the utility and independent power segments of the energy industry. I am
11 currently the Chief Operating Officer of OwnEnergy, Inc. (“OwnEnergy”) and a Vice
12 President of Development at EDF Renewable Energy, Inc. (“EDF Renewable Energy”).
13 I have developed two natural gas-fired electric generating plants in eastern Kentucky with
14 a total installed capacity of 830 MW, which were constructed in 2000 and 2001. Since
15 2001, I have developed or provided executive oversight to the development of 15 wind
16 farms in 8 different states totaling more than 1,256 MW installed capacity. Each of these
17 projects is either in operation or under construction. Since 2013, I have also provided
18 executive oversight for OwnEnergy’s construction management and asset management
19 services.

20

21 **Q. What is your relationship to Copenhagen Wind Farm, LLC?**

1 A. I have had executive oversight responsibilities since OwnEnergy began developing the
2 project in 2011. My involvement in the project includes obtaining land control,
3 managing public relations, securing environmental and technical studies, coordinating the
4 wind resource analysis, and oversight of all permitting. Prior to the completion of the
5 merger of OwnEnergy, Inc. and EDF Renewable Energy, I served as a Vice President of
6 Copenhagen Wind Farm, LLC.

7

8 **Q. Have you previously testified in regulatory proceedings before the Rhode Island
9 Public Utilities Commission or a similar regulatory body in another state?**

10 A. Yes. I have provided testimony before the Minnesota Public Utilities Commission for the
11 permitting of two wind farms in Minnesota.

12

13 **II. Purpose of Testimony**

14 **Q. What is the purpose of your testimony?**

15 A. My testimony is offered in support of Power Purchase Agreement (“PPA”) entered into
16 between The Narragansett Electric Company d/b/a National Grid (“National Grid”) and
17 Copenhagen Wind Farm, LLC (“Copenhagen”), which National Grid submitted to the
18 Rhode Island Public Utilities Commission (the “Commission”) for review and approval
19 in this docket. My testimony will provide information about the progress of the
20 development of the Copenhagen Wind Farm, the plans to meet the commercial operation

1 date for the wind farm, and the experience of OwnEnergy and EDF Renewable Energy in
2 wind farm development, operation, and maintenance.

3
4 **III. Overview of the Copenhagen Wind Farm**

5 **Q. Please provide a brief description of the Copenhagen Wind Farm.**

6 A. The Copenhagen Wind Farm is a 79.9 MW wind powered electric generation project
7 under development in Denmark, New York. The project will interconnect to the electric
8 power system on the Niagara Mohawk Power Corporation d/b/a National Grid Black
9 River – Lighthouse Hill 115 kV #6 line. The point of interconnection will be located
10 approximately 4.89 miles from Black River and 30.51 miles from Lighthouse Hill.

11
12 **Q. What is the projected commercial operation date for the Copenhagen Wind Farm?**

13 A. The current projected commercial operation date is December 31, 2017.

14
15 **IV. Current Status of the Development of the Copenhagen Wind Farm**

16 **Q. What is the status of Copenhagen's efforts to obtain the necessary permits for the
17 project?**

18 A. Copenhagen has started the permitting process and anticipates it will receive all permits
19 required to start construction no later than May 2016. Copenhagen intends to submit a
20 Joint Application for Permit to the US Army Corps of Engineers and New York State
21 Department of Environmental Conservation (NYSDEC) no later than October 2015 and

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1 anticipates receiving the necessary wetland fill, stream crossing, and water quality
2 approvals from both agencies in the first quarter of 2016. Copenhagen also plans to
3 submit an application to NYSDEC for a State Pollution Discharge Elimination System
4 (SPDES) permit in that time frame. Lastly, Copenhagen intends to submit applications to
5 the New York Department of Transportation (NYDOT) to allow the project to
6 temporarily improve various public roads to allow for the delivery of oversized project
7 components. Copenhagen anticipates receiving this permit from NYDOT in the first
8 quarter of 2016.

9
10 Additionally, Copenhagen has voluntarily committed to securing an Individual Take
11 Permit (ITP) from the US Fish and Wildlife Service (FWS) to address the potential risk
12 of harm to federally endangered bat species. This permit is not required for construction
13 or operation. Nevertheless, Copenhagen has spent more than three years in consultation
14 with the FWS on plans that will culminate in the receipt of an ITP, likely in second
15 quarter of 2016. Copenhagen anticipates receiving a technical assistance letter from the
16 FWS in October 2015 that commits the project to total avoidance measures while
17 awaiting receipt of the ITP, such that even if the ITP is not issued in the expected
18 timeframe the project could still start construction and operation.

19
20 Copenhagen has already received conditional site plan approval for the development of
21 the wind farm. Copenhagen is in the process of completing site plan review and receipt

1 of a special use permit covering the development of the 8.8 mile 115kV transmission line.
2 Copenhagen expects to complete this process in the fourth quarter of 2015.
3

4 **Q. Are the facilities necessary for Copenhagen to deliver the energy to the Delivery**
5 **Point defined in the PPA already in place?**

6 A. Stand-alone system upgrades and select network upgrades must be completed before
7 Copenhagen can deliver energy to the PPA Delivery Point. The stand-alone upgrade
8 consists of a new 3-breaker ring bus point of interconnection (POI) station adjacent to the
9 existing Black River – Lighthouse Hill 115kV line #6. Additional network upgrades
10 include short loop-in/loop-out structures that line the new POI station to the existing
11 electrical grid, as well as upgrades to the protection and communication systems within
12 the Black River and Lighthouse Hill stations. National Grid – New York expects to
13 complete development of functional specifications for these upgrades in December 2015.
14 Following the issuance of the functional specification, Copenhagen will prepare detailed
15 engineering drawings for the POI station for National Grid – New York’s approval.
16 Then, Copenhagen will build the POI station. National Grid - New York will manage the
17 engineering, procurement, and construction of the other network upgrades. At present,
18 National Grid – New York has committed to accommodating a commercial operation
19 date in May 2017, however, Copenhagen and National Grid – New York are working
20 together to try to shorten this time line.
21

1 **Q. Please describe any other additional steps Copenhagen has taken to date to meet the**
2 **proposed commercial operation date?**

3 A. Through OwnEnergy's merger with EDF-RE, Copenhagen has secured the ability to
4 balance-sheet-finance the project's construction; a significant milestone in the
5 development of the project. Copenhagen also is negotiating a turbine supply agreement
6 with General Electric for turbine deliveries in fourth quarter of 2016.

7
8 **Q. Are the steps you have described above typical for the development of a land-based**
9 **wind farm of this size and is that development on track?**

10 A. Yes. This project is on track and proceeding through the typical progression of actions
11 and steps. The sale of the energy through the procurement of a PPA is a key element in
12 advancing the project and moving into the active construction phase.

13
14 **V. The Entities Involved in Developing Copenhagen Wind Farm**

15 **Q. What is the corporate relationship between Copenhagen, OwnEnergy, Inc., and**
16 **EDF Renewable Energy, Inc.?**

17 A. Through a recent acquisition by EDF Renewable Energy, Inc. of OwnEnergy, Inc., EDF
18 Renewable Energy, Inc. essentially owns the Copenhagen Wind farm. Here are the
19 details and corporate structure: The Copenhagen Wind Farm is owned by Copenhagen
20 Wind Farm, LLC, a Delaware limited liability company. Copenhagen Wind Farm
21 Holdings, LLC, a Delaware limited liability company is the sole Member and owns 100%

1 of the membership interests of Copenhagen Wind Farm, LLC. OE Copenhagen Wind
2 Farm Holdings, LLC, a Delaware limited liability company is the Managing Member of
3 and owns 87.5% of Copenhagen Wind Farm Holdings, LLC. OE Copenhagen Holding
4 Company, LLC, a Delaware limited liability company is the Managing Member of and
5 owns 87.5% of OE Copenhagen Wind Farm Holdings. OwnEnergy. is the sole Member
6 of and owns 100% of OE Copenhagen Holding Company, LLC. EDF Renewable Energy
7 owns approximately 95% of the stock of OwnEnergy, with the remainder held by
8 common stockholders. It is anticipated that EDF Renewable Energy will own 100% of
9 OwnEnergy in the near future.

10
11 **VI. Experience Developing Wind Farm Projects**

12 **Q. Please describe OwnEnergy's experience with constructing and operating projects**
13 **of this nature.**

14 A. OwnEnergy has developed 8 wind farms located in 6 different states (Pennsylvania,
15 Kansas, Oklahoma, Iowa, Montana and Texas) that are either in operation or under
16 construction. These wind farms have a combined nameplate capacity of 329 MW. These
17 projects range in size from 10 MW to 68 MW and use wind turbines manufactured by
18 General Electric, Siemens and Gamesa.

19
20 **Q. Are any of OwnEnergy's other projects comparable to the Copenhagen Wind**
21 **Farm?**

1 A. OwnEnergy managed the 2014 construction of a 68 MW wind farm in Archer County,
2 Texas, and continues to manage the operation of that wind farm. The Archer County,
3 Texas wind farm is comparable in size and operation to the Copenhagen Wind Farm.
4

5 **Q. Can you describe EDF Renewable Energy’s experience developing wind farms?**

6 A. EDF Renewable Energy has extensive experience developing, operating, and maintaining
7 wind farms throughout many regions of the United States, as well as in Canada and
8 Mexico. Currently, in North America, EDF Renewable Energy owns and operates 3.1
9 Gigawatts (GW) of installed capacity, has 1.1 GW of installed capacity under
10 construction, and has developed a total of 5.6 GW of installed capacity, including
11 projects it developed and then sold. Additionally, EDF Renewable Energy provides
12 operation and maintenance wind projects totaling 9,500 MW of nameplate capacity,
13 much of which is provided for third-party owners. The depth and breadth of EDF
14 Renewable Energy’s experience in the wind energy sector is demonstrated in the EDF
15 EN North America Company Overview, provided as Attachment 1 to this testimony.
16

17 **Q. How do those wind farms compare the Copenhagen wind farm?**

18 A. Many of the projects that EDF Renewable Energy has developed, operated, and/or
19 maintained are similar to the Copenhagen Wind Farm in terms of size, construction, and
20 operation. Additionally, EDF Renewable Energy has experience installing and operating
21 the General Electric turbines planned for this project.

1 **VII. Conclusion**

2 **Q. Have you reviewed the pre-filed testimony of Corinne DiDomenico submitted by**
3 **National Grid in this docket?**

4 A. Yes.

5

6 **Q. Do you agree with the testimony provided by Ms. DiDomenico regarding the**
7 **provisions of the PPA?**

8 A. Yes.

9

10 **Q. Does this conclude your testimony?**

11 A. Yes.

EXHIBIT 1



EDF EN NORTH AMERICA COMPANY OVERVIEW

30 June 2015



Sustainability Starts Here

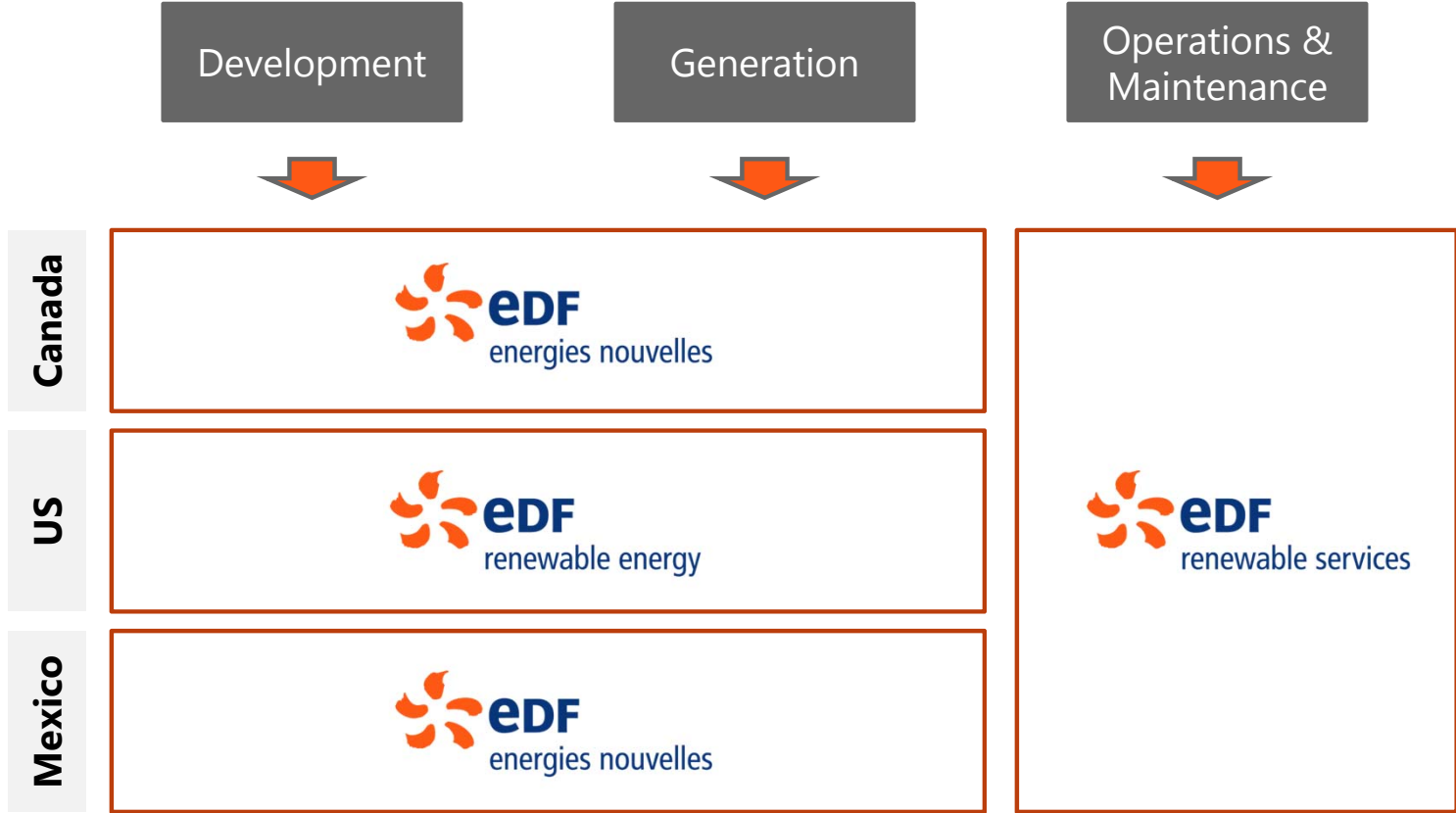
- ✿ **EDF Renewable Energy is a leading independent power producer with more than 25 years of expertise in the renewable industry covering all range of services from project development, management, to operations and maintenance.**
- ✿ **We are dedicated to helping drive the transition to a sustainable energy economy through our deployment of renewable energy resources**
- ✿ **We provide extensive services all along the value chain, from site selection & development, to long-term operations and maintenance services**
- ✿ **We operate in Canada and Mexico through affiliate companies: EDF EN Canada and EDF EN Mexico**

3.1 GW Installed Capacity (North America)

as of 30 June 2015

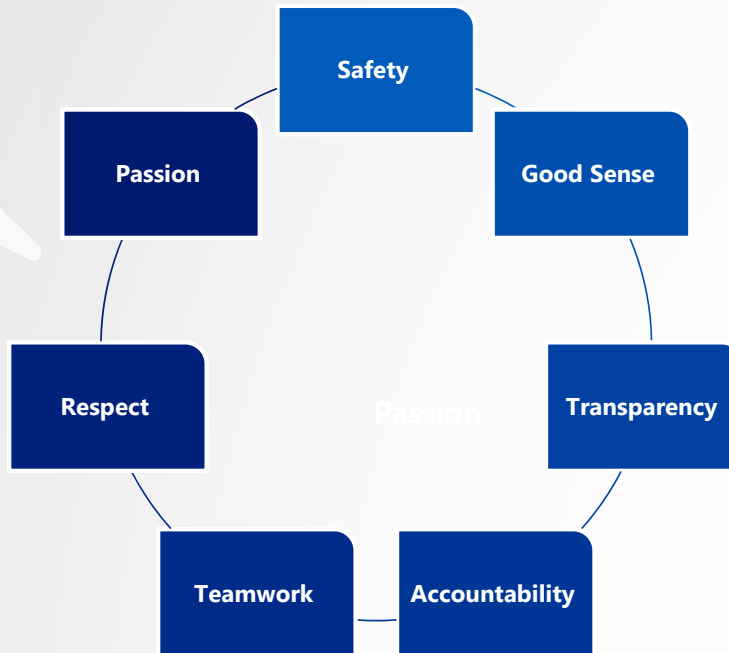
5.6 GW MW Developed (North America)

EDF EN North America: 3 business Lines; 3 countries; 1 brand



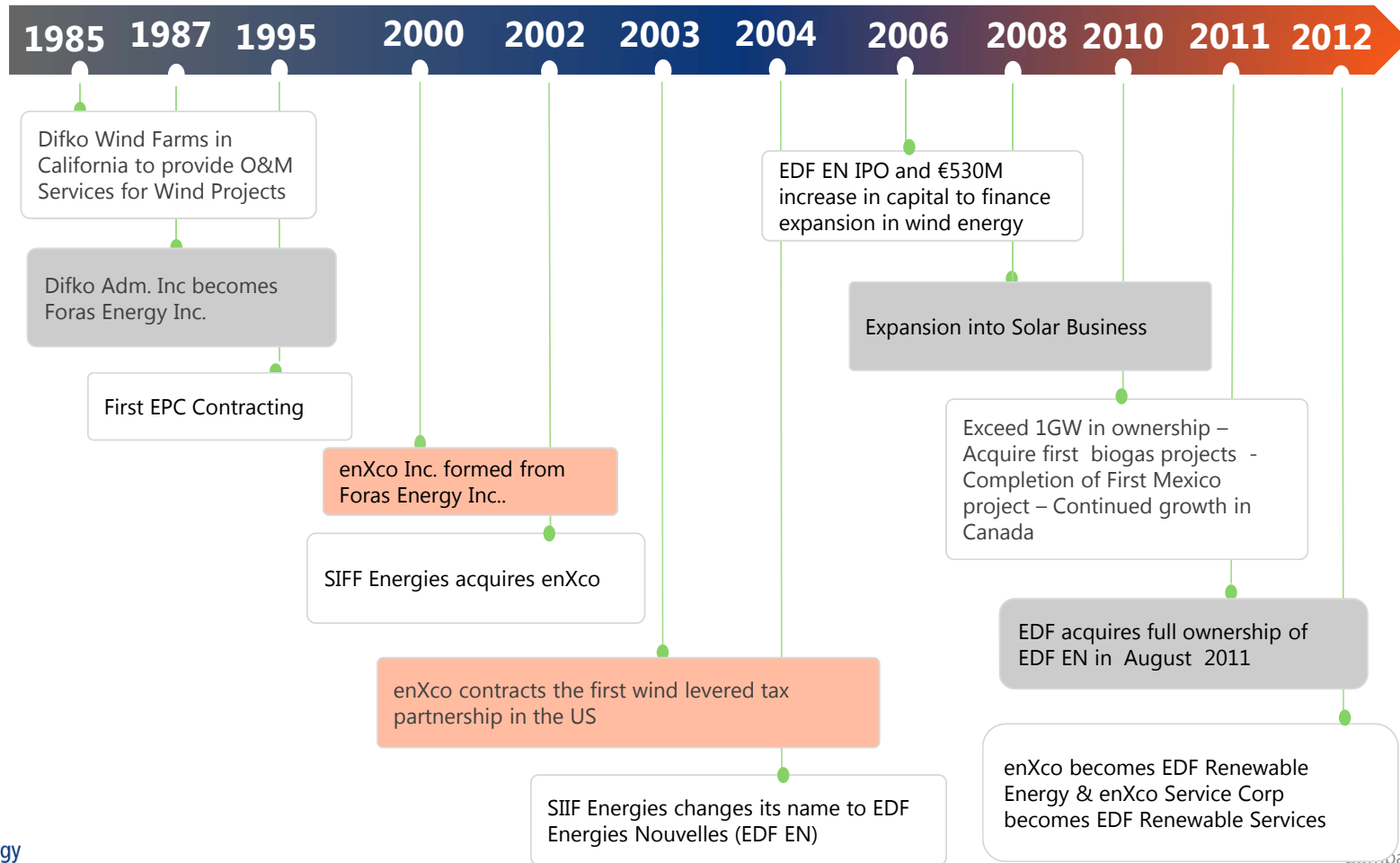
Our Mission & Values

Turning innovative **renewable energy** ideas and long-term relationships into ethical, high-value **sustainable business**.

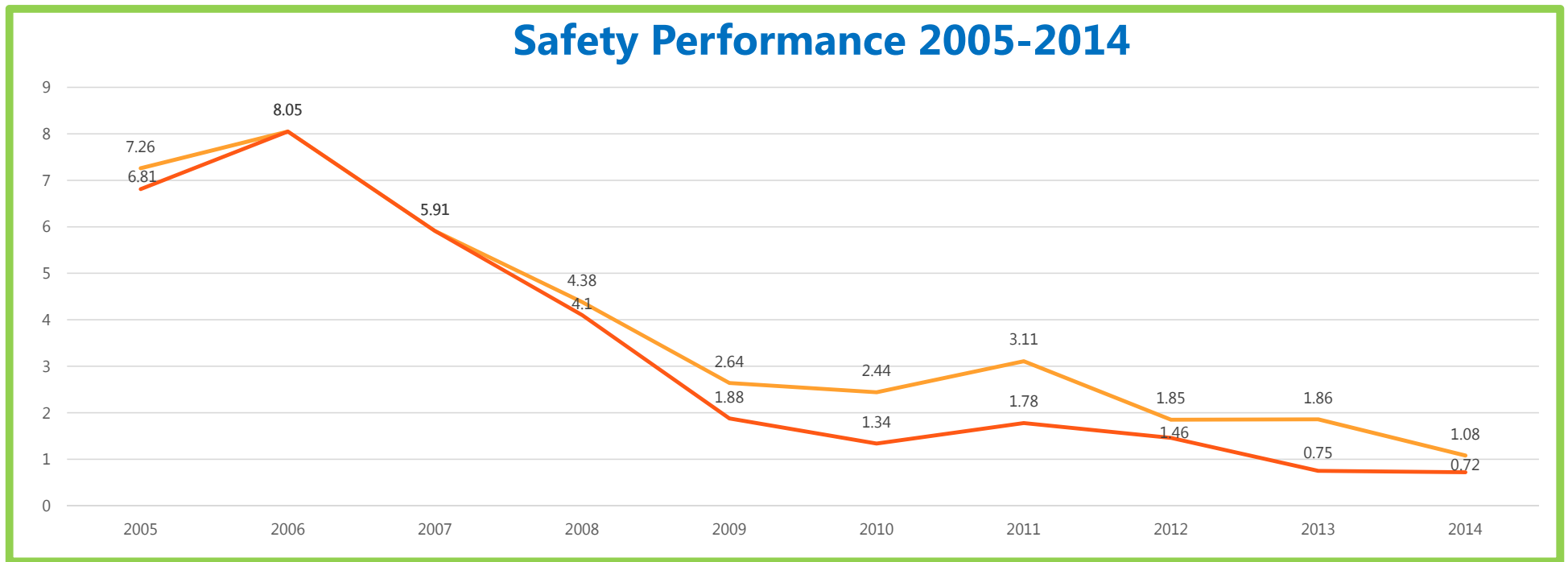


At EDF Renewable Energy, we believe our **core values** are the **foundation** upon which our **success is built**. By embracing these seven values we will foster continued success allowing EDF Renewable Energy to thrive and adapt in an ever-changing competitive marketplace.

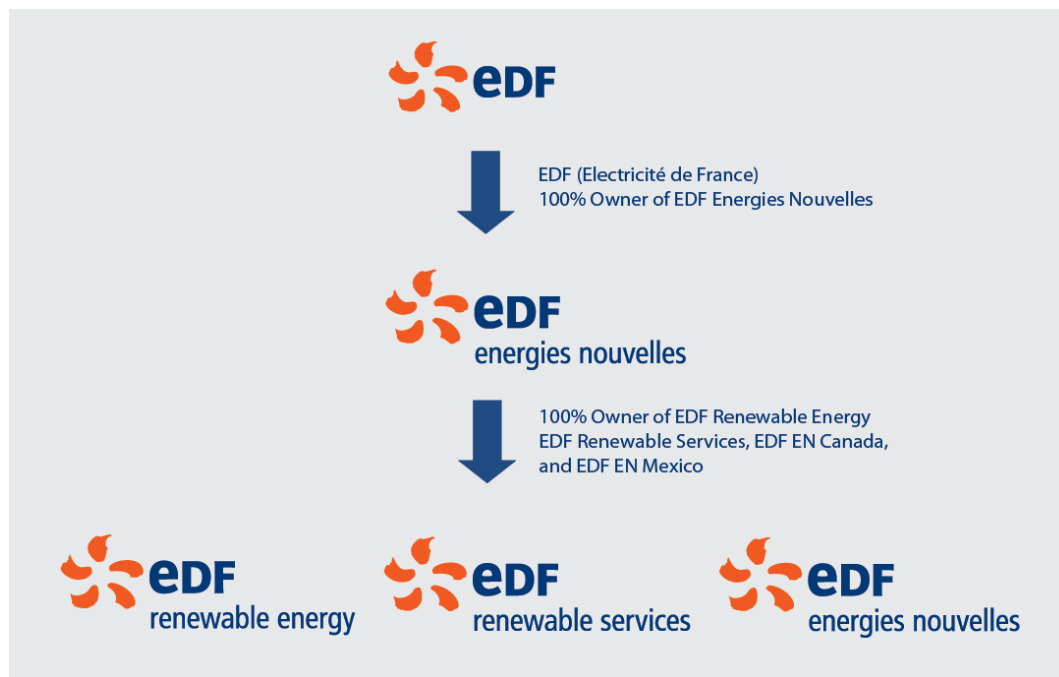
EDF Renewable Energy: HISTORY IN BRIEF



Historic Safety Performance : United States



Corporate Structure



EDF

...the leading electricity company in the world

EDF Energies Nouvelles (EDF EN)

...the global renewable arm of the EDF group

EDF Renewable Energy

...the US Subsidiary of EDF EN
and headquarters of EDF EN activities in North America

EDF Renewable Services

...the O&M branch for North America

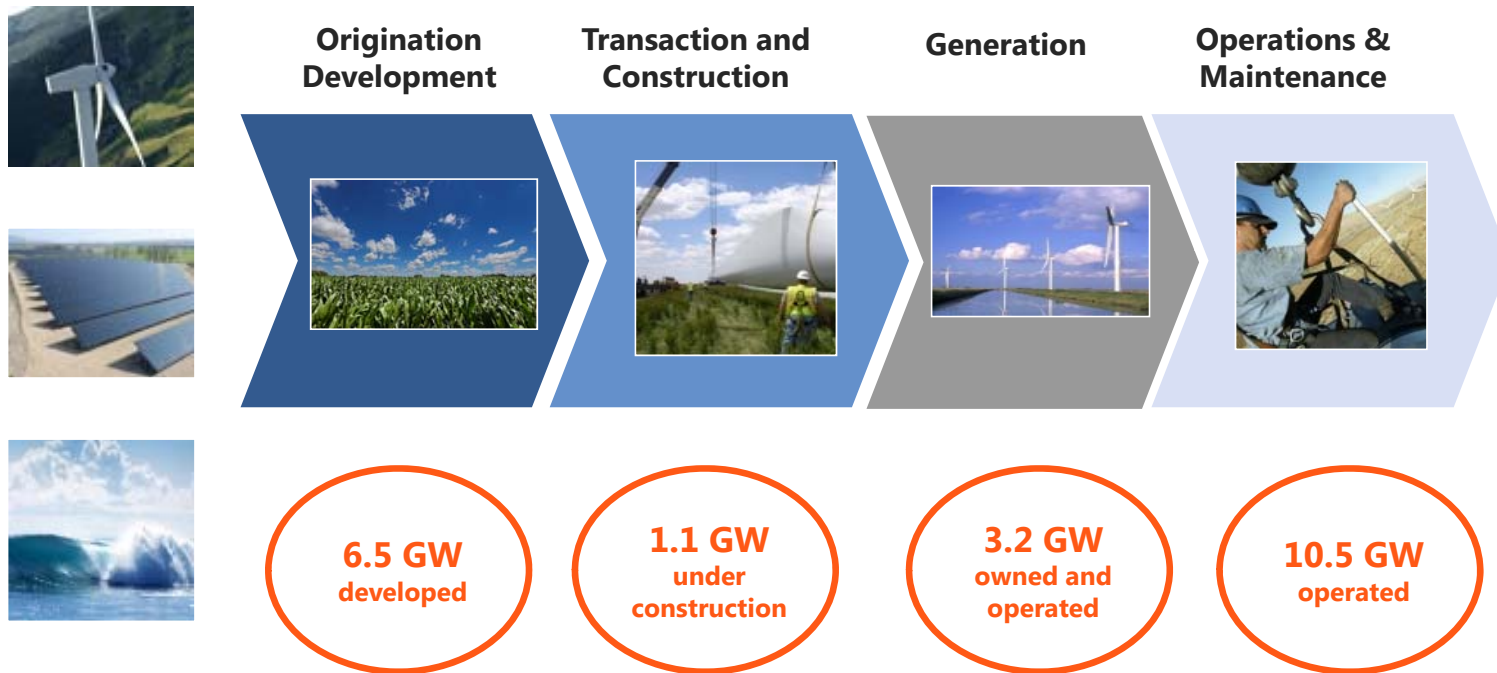
EDF EN Canada

...the Canadian Subsidiary of EDF EN

EDF EN Mexico

...the Mexican Subsidiary of EDF EN

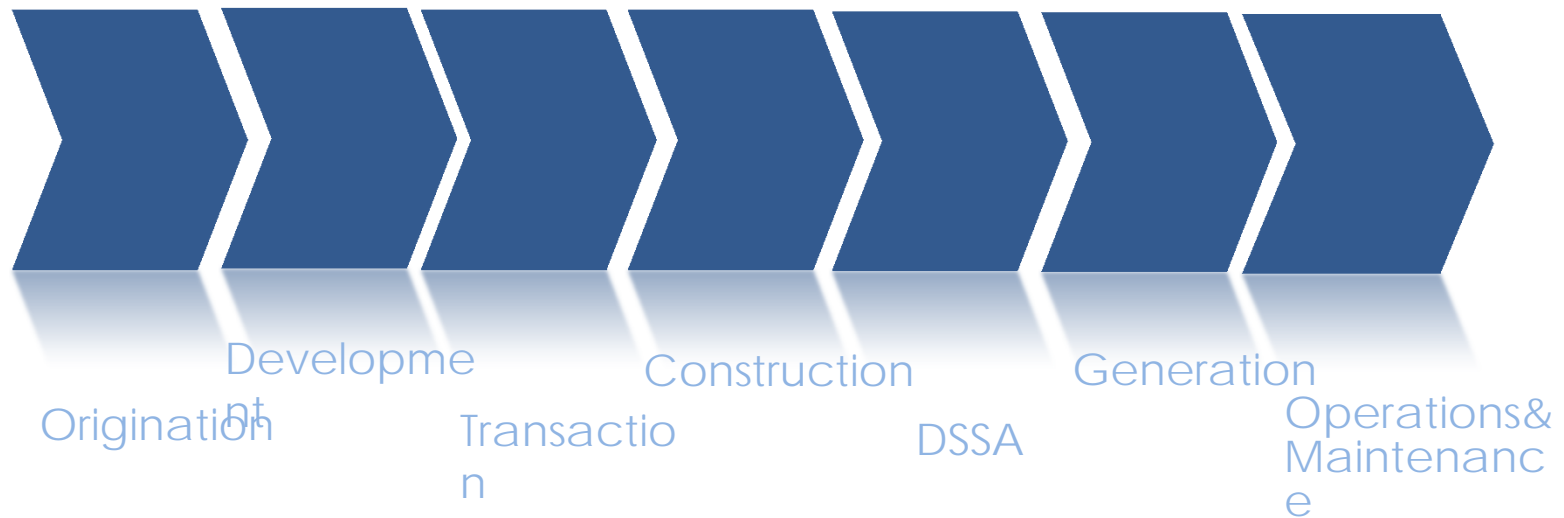
Integrated Operator in North America



as 30 June 2015

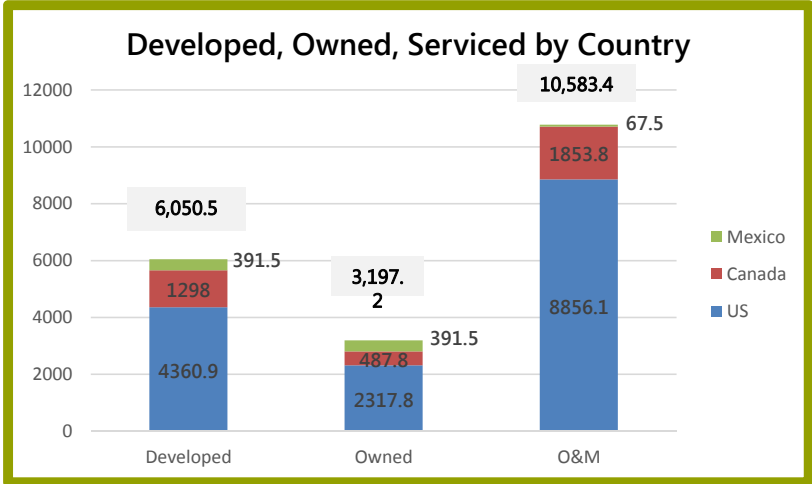
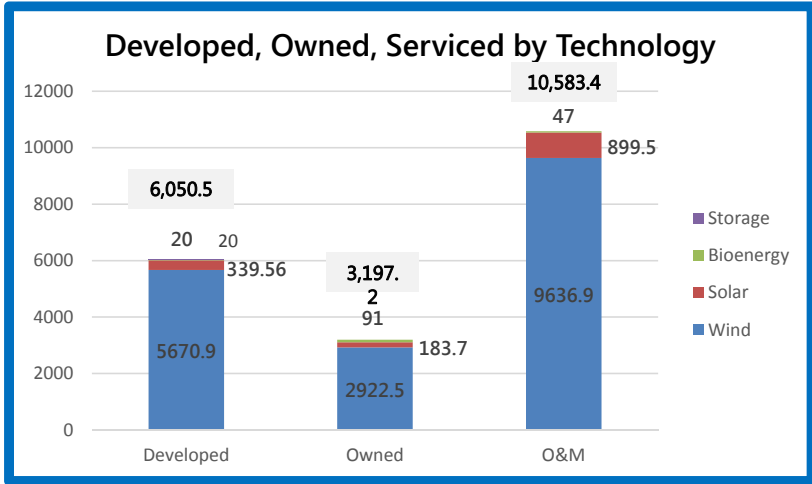
Integrated Operator in North America

Extensive services all along the value chain, from site selection & development, to long-term operations and maintenance services



Balanced Portfolio

Over 6 GW developed
Over 3.2 GW owned
Over 10 GW operated



EDF EN North America KEY FIGURES

INSTALLED
CAPACITY



3.2 GW

OPERATIONS &
MAINTENANCE



10.5 GW

UNDER
CONSTRUCTION



1.1 GW

EMPLOYEES
NORTH AMERICA

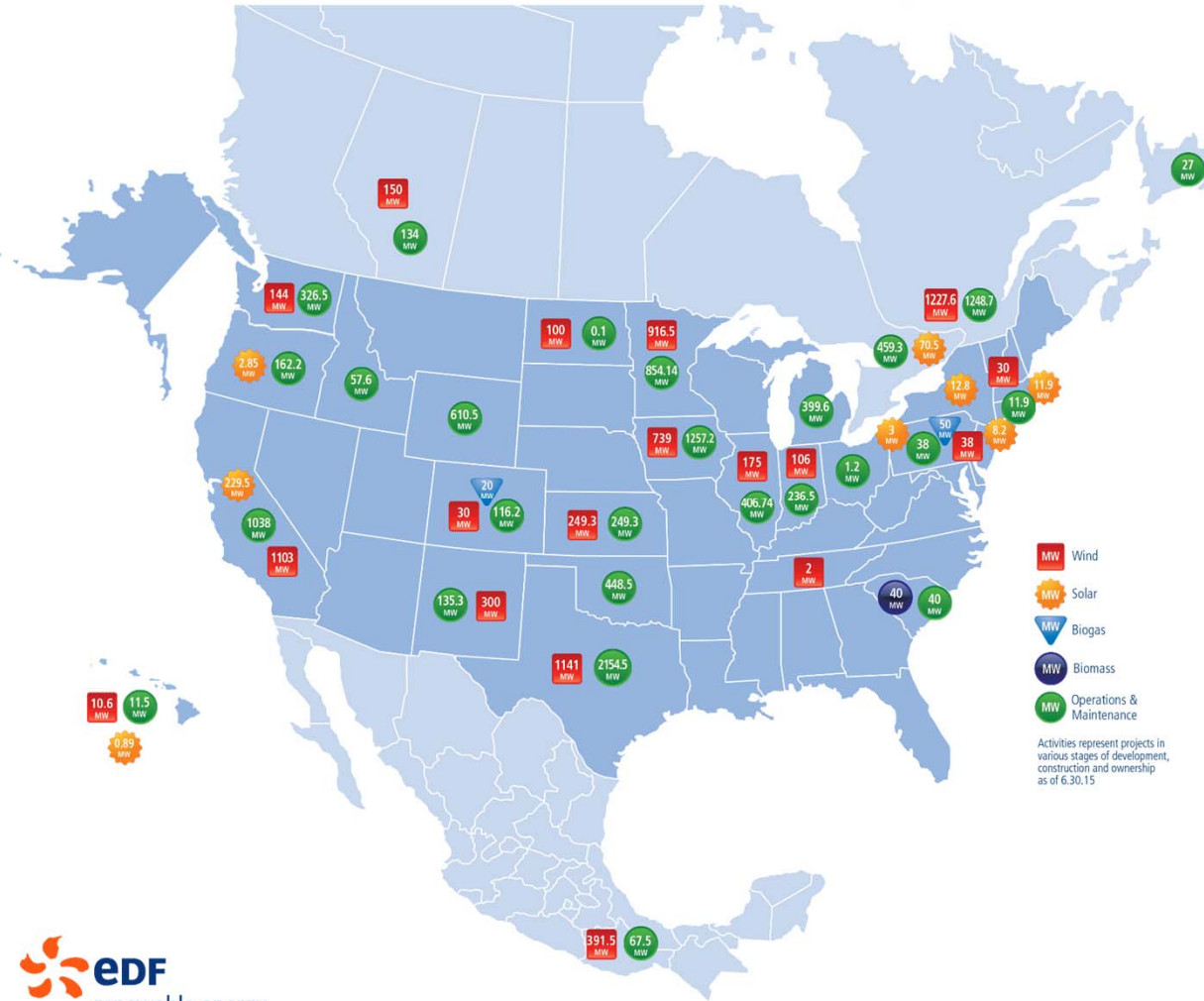


1,000

28 YEARS
EXPERIENCE



North America Presence



3.2 GW INSTALLED CAPACITY

OPERATIONS & MAINTENANCE **10.5 GW**

1.1 GW UNDER CONSTRUCTION

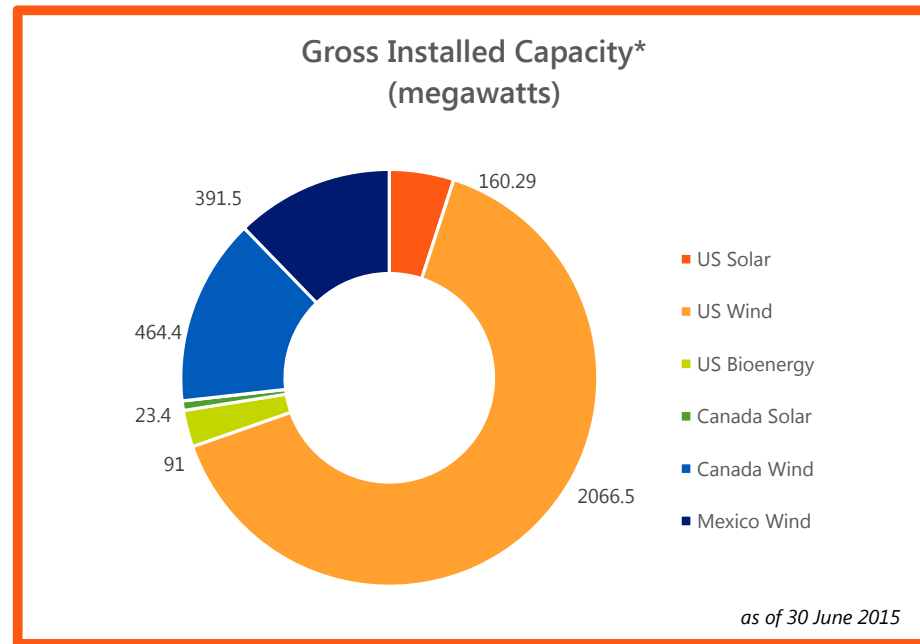
EMPLOYEES **1000**

94 PROJECTS DEVELOPED

EDF EN North America

GROSS INSTALLED CAPACITY NORTH AMERICA

US Wind:	2,066.5
US Solar:	160.3
US Biogas:	51.0
US Biomass:	40.0
<hr/>	
CN Wind:	464.4
CN Solar:	23.4
<hr/>	
MX Wind:	391.5
<hr/>	
TOTAL:	3,197.1



*Gross Installed Capacity represents gross megawatts of ownership

Project Development

- ✿ EDF Renewable Energy's Project Development team is dedicated to creating value by managing projects from **origination through commercial operation**. Initial efforts involve identifying potential project sites, establishing business relationships with landowners, and securing permits and transmission rights. As the project progresses, our team executes all contracts, secures financing, procures equipment, and assures timely construction for full operation.



UNDER CONSTRUCTION: 1.1 GIGAWATTS

As of
June 30

UNDER CONSTRUCTION UNITED STATES

1132.9 MW



Cottonwood Solar: 1 MW



Spinning Spur 3: 194 MW



Roosevelt: 250 MW
Milo: 49.65 MW



Pilot Hill: 175 MW
McHenry: 20 MW



Slate Creek: 150 MW



Heartland: 19MW

UNDER CONSTRUCTION CANADA

274 MW



Rivière-du-Moulin: 200 MW
Mont Rothery: 74 MW

Operations & Maintenance



Maximize Profitability



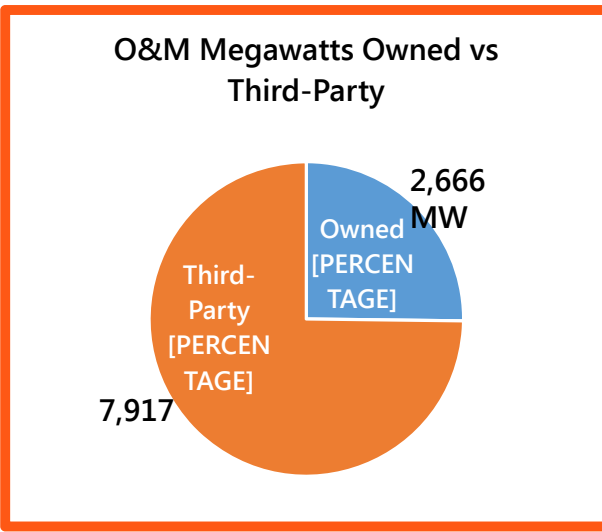
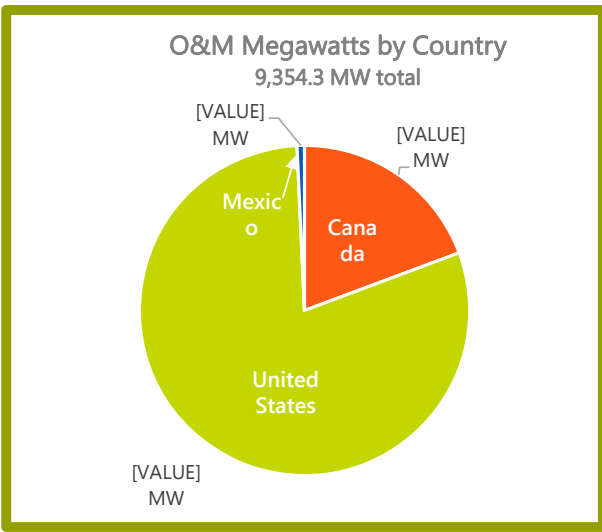
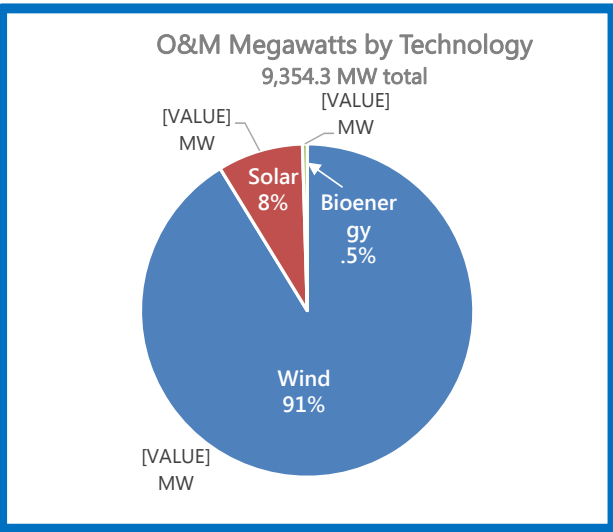
Optimize Availability



Analyze Performance

- ✦ EDF Renewable Services understands renewable energy facilities represent a substantial investment for the project owner. Operations and Maintenance is the core business with the goal to **optimize plant performance and maximize availability**. Over the last two decades, the company has honed its expertise to bring completely transparent service offering to the asset owner.

O&M Services Portfolio Reaches 10.5 GW



Largest third-party provider of O&M services in North America



Operations Control Center



In 2013 the OCC underwent a **modernization** and **relocation** effort to our San Diego headquarters.

Profitability | Data Expertise | 6,000+ MW under OCC monitoring

Standard Services

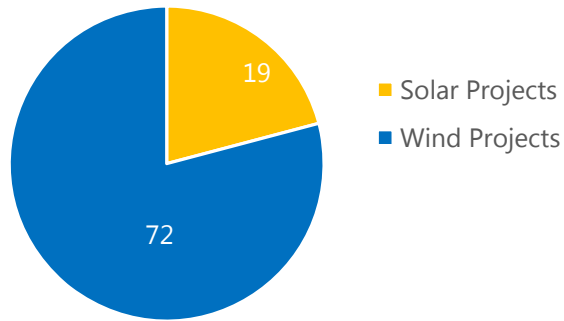
- ✓ 24/7/365 Remote Monitoring
- ✓ Fault Reset & Notification
- ✓ Curtailment
- ✓ Crew Support

Advanced Services

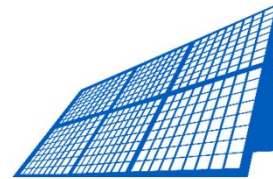
- ✓ SCADA Support
- ✓ Balance of Plant
- ✓ Performance Monitoring
- ✓ NERC Compliance Support

Operations Control Center

77 projects under monitoring & control

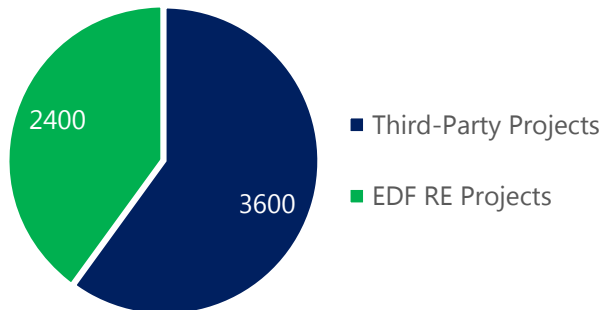


3,500 Wind Turbines



300 Solar Inverters

6,000 megawatts under monitoring & control



listed as **Generation Operator** in the **NERC** Compliance Registry with Western Electricity Coordinating Council

Why EDF Renewable Services OCC?

■ Safety

Our robust clearance management system ensures the safety of technicians and avoids damage to site assets.

■ Maximized Revenue

The Operations Control Center helps EDF RS respond in real-time to site issues and customer needs, decreasing downtime, increasing site availability and thus yield, resulting in maximized revenues and profitability.

■ Collaborative Troubleshooting

Specialists at the OCC work in collaboration with the customer, looking at operation and performance issues to assure the plant equipment is operating to full function.

■ Customized Reporting

Daily, weekly and/or monthly reports provide a record of key operating parameters and significant operational events, trends and anomalies. This data is summarized to assist with the identification of performance shortfalls and the planning of maintenance activities.

■ Reliability

EDF RS OCC monitoring and reporting provides confidence that assets are operating at maximum efficiency and following reliability standards.

■ Expertise

EDF RS has a 25 year history as an O&M provider bringing decades of expertise to each plant, with an owner/operator sensibility. We understand the opportunities and challenges faced every day in the renewable energy business.

OCC's Technological Advancements

■ Integrated SCADA system

The Operations Control Center provides Operators with a “one-look” integrated SCADA system that brings fault conditions to the staff automatically. This “Exceptions Management” approach uses technology to increase Operators’ efficiency and response.

■ System Redundancies

The OCC’s systems have been designed with redundant layers to provide continuous operations independent of equipment failures.

Examples include:

- Full replication of the IT server system in real-time failover mode in a data farm located in another state,
- Virtualization of servers and hot-replaceable components mitigates the impact of any one failure,
- Back-up power systems and redundant Internet service providers ensures constant power and communications..

■ Cybersecurity

The OCC has been designed to meet the physical and cyber security requirements needed to meet regulatory standards and protect the facility from future sabotage or intrusion attacks.

■ Disaster Recovery

The redundant systems design allows the OCC to continue operating and controlling plants even when communications, power, or even natural disasters affect the local facility.

■ Staff Ergonomics

Operator productivity has been addressed by including vertical lift Stand-up workstations, curved consoles, and locker, kitchen, and restroom facilities within the actual control center