EDF renewables

Energy Innovation for the Next Generation

Vision. Ambition. Innovation.

Our Mission

Delivering renewable **solutions** to lead the transition to a **sustainable energy** future

For over 35 years, EDF Renewables has been providing clean energy solutions throughout North America.

EDF Renewables North America is a market-leading, independent power producer and service provider, delivering:

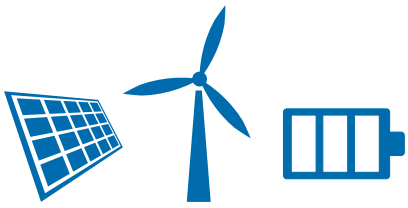
grid-scale power: wind (onshore and offshore), solar photovoltaic and storage projects

distributed solutions: solar, solar+storage, electrical vehicle charging and energy management

asset optimization: technical, operational and commercial skills to maximize performance of generating projects

EDF Renewables' North American portfolio consists of 20 gigawatts (GW) of developed projects and 13 GW of operating assets under service contracts.

EDF Renewables North America is a subsidiary of EDF Renouvelables, the dedicated renewable energy affiliate of the EDF Group.



GRID-SCALE POWER

Big projects. Bigger impact.

EDF Renewables' Grid-Scale Power team provides origination, development, transaction and construction services for large-scale wind (offshore and onshore), solar power generation, and storage projects across North America.

Our team of leaders can solve energy challenges facing corporations and communities no matter the size or complexity.

35+ years

We've been on the forefront of the burgeoning wind industry in California as a service provider beginning in 1985.

20 GW

We expanded into project development in 2000 and have developed 20 GW of grid-scale solar, wind and storage projects across North America.

$18 billion

Since 2010, we have paid over $18 billion to vendors, including lease payments made to landowners.

8,000

On site jobs created with 20 GW of projects developed.

Based on an employment factor of 4 jobs per MW

IRENA Annual Review 2018

DISTRIBUTED SOLUTIONS

Simple. Reliable. Integrated.

The Distributed Solutions team can create a fully integrated bundle for energy projects with solar, storage, electric vehicle charging and energy storage management.

We provide end-to-end service from development, engineering, procurement and construction to operations and finance.

Our solutions are customer-focused and customized to corporations, utilities and co-ops, landowners and institutions.

20+ years

We started our distributed business in 1998, which consisted of residential and small commercial solar projects. Our first distributed project in 2008 was 1 MW, located in Vacaville, California.

2,500+ installations

We have experience designing, developing, and constructing solar and storage projects on all types of sites, including landfills, brownfields, and wastewater treatment plants.

1,200+ MW

Distributed Solutions teams have installed over 1,200 MW of solar photovoltaic and storage projects.

20-100

Temporary construction jobs created per project during construction.

20

States with O&M jobs for the life of projects.

ASSET OPTIMIZATION

Maximize power production, efficiency and your investment.

The Asset Optimization team offers a full range of services for all phases of renewable energy projects – operations, management, procurement, routine and emergency maintenance, retrofits and upgrades.

Our experienced team of over 400 full-time technicians, supervisors, managers and support staff means EDF Renewables is fully equipped to manage the balance of plant and day-to-day operations of your wind or solar project.

13 GW operations & maintenance

- On site Preventative and Corrective Maintenance
- Balance of Plant (BOP) Management
- Major Component Repair / Replacement
- Engineering Support

11.7 GW under OCC monitoring

- 24/7/365 Remote Monitoring
- Performance Reporting
- Fault Reset / Notification Curtailment
- SCADA / NERC Compliance Support

7.8 GW assets under management

- Manage Cash / Debt Equity
- Ensure Contractual Compliance
- Monitor / Limit Market Risk
- Identify / Remedy Underperforming Assets
- Manage PPAs

400+ asset optimization experts

ONSHORE WIND

Wind power is a limitless, non-polluting resource that consumes virtually no water, and the power it generates is even more affordable than ever, with a 60%+ reduction in cost over the last five years.

Source: AWEA

Generating reliable energy, jobs and revenue.

When we operate our wind facilities, we provide long-term, fixed pricing in an environment where prices are constantly increasing, while also reducing CO_2 emissions, the most abundant greenhouse gas in the atmosphere.

Our wind projects support the local communities in which we work through landowner payments and tax revenues, while simultaneously creating jobs in construction and wind project operations. EDF Renewables' operating wind plants are among the top performers in the industry.

If you are a utility, municipality, cooperative, university or corporation, EDF Renewables can formulate a deal structure that meets your specific renewable energy goals.

We offer traditional Purchase Power Agreements (PPAs), Virtual Power Purchase Agreements (VPPAs), Design Build Sell (DBS) and a number of other offtake arrangements including hedges and renewable block products.

ONSHORE

12 GW
developed

82
projects

3
countries

OFFSHORE WIND

Offshore wind is a vast energy resource in the U.S., with a technical potential of more than 2,000 GW, or nearly double the nation's current electricity use.

New opportunities, new ventures in wind.

We are taking advantage of our many years of experience from onshore projects in order to guarantee an optimal level of operation for our offshore facilities.

Harnessing America's offshore wind resources presents an enormous opportunity to:

- Create tens of thousands of highly skilled jobs
- Revitalize coastal communities
- Deliver large amounts of clean, reliable energy to the country's biggest population centers

3 GW
in development

ATLANTIC SHORES
offshore wind

In 2018, EDF Renewables North America and Shell New Energies US, LLC formed a 50/50 joint venture, Atlantic Shores Offshore Wind, LLC, to co-develop a lease area with the potential of approximately 3,000 MW of offshore wind energy — enough to power close to 1.5 million homes. The lease comprises 183,353 acres approximately 10-12 miles off the New Jersey coast on the U.S. Outer Continental Shelf (OCS).

SOLAR

Solar energy is a sustainable, indefinitely renewable resource for energy consumption, experiencing continued growth as the cost to install solar has dropped 70% since 2010.

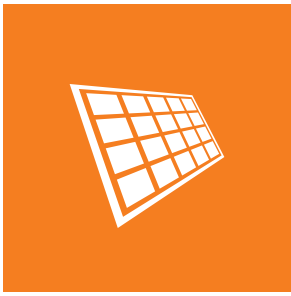
Source: SEIA

Producing sustainable energy to meet demands.

We design and build solar projects both on the distributed and grid-scale level. We contract with offtakers for long-term agreements or turnkey solutions — for customers who desire to own the asset.

EDF Renewables is also a leading developer of environmentally sensitive sites, revitalizing former landfills, brownfields and wastewater treatment plants into solar facilities.

Our tailor-made solutions meet the growing energy needs and demands of utilities, municipalities, cooperatives, universities and corporations.



9.7 GW
developed, constructed or contracted

415
distributed or utility projects constructed and operating in North America

3
countries

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Clean and affordable energy, right where you need it

An onsite solar system is just as good for business as it is for the environment. Market data suggests that the average commercial property owner in the U.S. can slash overall energy costs by 75% by going solar. That's because producing your own electricity with solar at your facility means you'll greatly reduce your utility power consumption and the costly peak demand-based charges that come with it.

Since an onsite solar energy system is physically located at the point of use, it doesn't rely on the massive system of utility transmission and distribution lines that are increasingly vulnerable to extreme weather, accidents, and other threats. Our PowerFlex brand offers customers onsite clean technology with flexible solutions.

218
projects across the United States

324 MW
installed

STORAGE

Storage systems help energy and facility managers to forecast, manage and reduce operational energy costs and hedge against rising costs as much as 5-10% annually.

Source: Southern California Edison (SCE), Pacific Gas & Electric (PG&E), SDG&E: San Diego Gas & Electric (SDG&E)

Adding value, cost control and energy security.

Reducing operational cost is in higher demand than ever before. EDF Renewables strives to bring our business customers solutions that fit their specific requirements. Storage may be the right solution for your business as a standalone system or bundled with a solar package. In addition to lowering operational energy costs, storage can help control and forecast long-term energy budgets and increase energy reliability.

There are several options when it comes to adding storage – direct purchase, power purchase agreement, shared savings or power purchase agreement with shared savings. Each solution comes with a different set of factors. We can help you navigate these options and find the best solution for your business and bottom line.

5,500 MW / **21,600** MWh
in various stages of development

EDF Renewables delivers storage on both the distributed and utility scale. It's not just commercial solar shoppers who benefit from installing energy storage. In fact, utility-scale battery storage is increasingly playing a major role in the operation of the electric grid, providing cost savings, environmental benefits and new flexibility for the grid. We specialize in providing the design, financing, installation, and operation of energy storage and solar solutions in order to help businesses and utilities reach their long-term goals.

We are at the forefront of this cutting-edge technology leveraging our global energy storage experience. To develop these innovative projects, EDF Renewables builds on the expertise of its dedicated EDF Store & Forecast subsidiary, which was set up in 2014 and has developed a smart software solution to coordinate generation from renewable sources via forecasting and energy storage.

EV CHARGING

EV Charging is rapidly accelerating with the United States reaching one million electric vehicles sold by 2020 and more than half of new cars sold by 2040 will be EVs.

Source: Electric Vehicle Outlook 2017, Bloomberg Energy Finance

powerflex
EDF Renewables

Electric vehicle smart-charging systems – large scale, cost effective, load managed.

Charging solutions must be implemented in the right places and quantities to sustain the growth of Electric Vehicle (EV) adoption.

To meet the scale required of the current adoption trends, businesses are confronted with substantial upgrades to their electrical systems, making EV charging installations financially burdensome and lengthy in time, if not completely infeasible.

PowerFlex created Adaptive Load Management (ALM), a software algorithm that optimizes power consumption across a large network of charging stations. ALM optimizes each station's output to meet user demand while only using a fraction of the aggregate power traditionally required.

This allows businesses to shave as much as 60% off the cost of electrical system upgrades and peak demand charges, paving the way to larger and more affordable charging networks that ultimately meet or exceed the adoption pace of electric vehicles.

Workplaces
Campuses
Municipalities
Fleets

12,000
pipeline

500
in construction

5,000
deployed


Design


Hardware


Software


Installation


Maintenance

MICROGRID

Power outages are estimated to cost the U.S. economy $150 billion annually. A microgrid is a zero-capital-cost energy solution that delivers energy resilience, reliability, lowers utility bills and achieves sustainability commitments.

Source: Department of Energy

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Energy resilience and reliability.

A microgrid is a local, independent energy grid with control capability, which means during a power outage it can disconnect from the traditional grid and continue normal operations autonomously.

When there is a power outage, everyone is affected. This is where a microgrid can help. The solar and storage in a microgrid operates as normal while connected to the grid, but importantly, instead of turning off during an outage, the facility and its solar and storage microgrid can disconnect and continue to operate on its own using local energy generation in times of crisis like storms or planned rolling blackouts in times of high demand. A microgrid can be powered by traditional backup generators, batteries, and/or renewable resources like solar panels.

Combining Best of Both Worlds

Stand Alone Solar and Storage

Primary Purpose

Reducing Utility Bills and GHG Emissions

Power Outage Disadvantage

TURNED OFF

Integrated Solar + Storage + Diesel Generator Microgrid

Leveraging Advantages of all Existing Assets to Optimize Outage Operations

- **Reducing Fuel Costs**
- **Reducing GHG Emissions**
- **Extending Fuel Supplies**
- **Increasing Genset Lifetime**
- **Increased Resilience**
- **Increased Flexibility of Operations**

Standard Emergency Diesel Generator

Primary Purpose

Providing Long-Duration Emergency Back Up

Power Outage Disadvantage

Fuel Costs, GHG Emissions, Single Point of Failure, Limited Fuel Supply

OUR AFFILIATES

EDF renewables

Distributed Solutions
Grid-Scale Power
Asset Optimization

EDF

Wholesale Trading
Energy Optimization

powerflex
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Solar for Corporates
Storage
EV Charging
Micogrids
Energy Management

dalkia
EDF GROUP

Building Energy Services

framatome

Supplier of Nuclear
Equipment and Services

OUR OFFERINGS

Partners in energy innovation.

EDF Renewables' and EDF affiliates' coordinated offerings allow our corporate and institutional clients to meet their sustainability goals while saving them money.

Developing a clean energy roadmap with a full range of services to solve any energy challenge, no matter the complexity, is what we do best. The collaboration across our teams gives our customers access to an entire suite of options under one roof.

- Solar Carport
- Solar Rooftop
- Solar Ground-mount
- Electric Vehicles
- Operations & Maintenance
- Energy Efficiency
- Energy Management Systems
- Retail Energy Supply
- Thermal Generation
- Research & Development
- LED
- Storage

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