

DIRECTION

Policy • Advocacy • Business • Finance • Legal • Environment • International

GE to develop world's most powerful offshore wind turbine



GE will invest more than \$400 million over the next three to five years in development and deployment of the Haliade-X. (Courtesy: GE Renewable Energy)

BGE Renewable Energy recently unveiled its plan to develop the largest, most powerful offshore wind turbine: the Haliade-X. Featuring a 12 MW direct drive generator and an industry leading gross capacity factor of 63 percent, the Haliade-X will produce 45 percent more energy than any other offshore turbine available today. GE will invest more than \$400 million over the next three to five years in development and deployment of the Haliade-X.

“We want to lead in the technologies that are driving the global energy transition,” said John Flannery, chairman and CEO of GE. “Offshore wind is one of those technologies, and we will bring the full resources of GE to make the Haliade-X program successful for our customers.”

Towering 260 meters over the sea, more than five

times the size of the iconic Arc de Triomphe in Paris, France, the Haliade-X 12 MW carries a 220-meter rotor. Designed and manufactured by LM Wind Power, the 107-meter-long blades will be the longest offshore blades to date and will be longer than the size of a soccer field. One Haliade-X 12 MW turbine will generate up to 67 GWh annually, enough clean power for up to 16,000 households per turbine, and up to 1 million European households in a 750 MW windfarm configuration.

“The renewables industry took more than 20 years to install the first 17 GW of offshore wind,” said Jérôme Pécresse, president and CEO of GE Renewable Energy. “Today, the industry forecasts that it will install more than 90 GW over the next 12 years. This is being driven

by lower cost of electricity from scale and technology. The Haliade-X shows GE's commitment to the offshore wind segment and will set a new benchmark for cost of electricity, thus driving more offshore growth."

The ability to produce more power from a single turbine means a smaller number of turbines in the total farm, which translates to less capital expenditure for the balance of plant and reduced risk in project execution as the installation cycle time is reduced. It also simplifies operation and maintenance of the wind farm. All of this reduces the investment and operation cost for developers, makes offshore wind projects more profitable, and ultimately lowers cost of electricity for consumers.

"The Haliade-X 12 MW will help our customers in an increasingly competitive offshore environment, and through its size and digital functionality provide important value across manufacturing, installation and operation," said John Lavelle, CEO of Offshore Wind at GE Renewable Energy.

GE's Haliade-X platform is designed to offer greater efficiency in generating power from the wind that is available. With a 63 percent gross capacity factor, the Haliade-X 12 MW is five to seven points above the current industry benchmark. Therefore, it will produce more energy per megawatt installed, which will significantly increase returns for customers.

To design and build the Haliade-X platform, GE

Renewable Energy is relying on an unprecedented collaboration across the GE portfolio, leveraging the knowledge of GE's Onshore wind team, with 50,000 turbines in the field; the blade expertise of LM Wind Power; the GE Power and GE Aviation engineers for peer reviews of component and systems design; the Global Research Center for control systems and component validation; and GE Digital for supporting

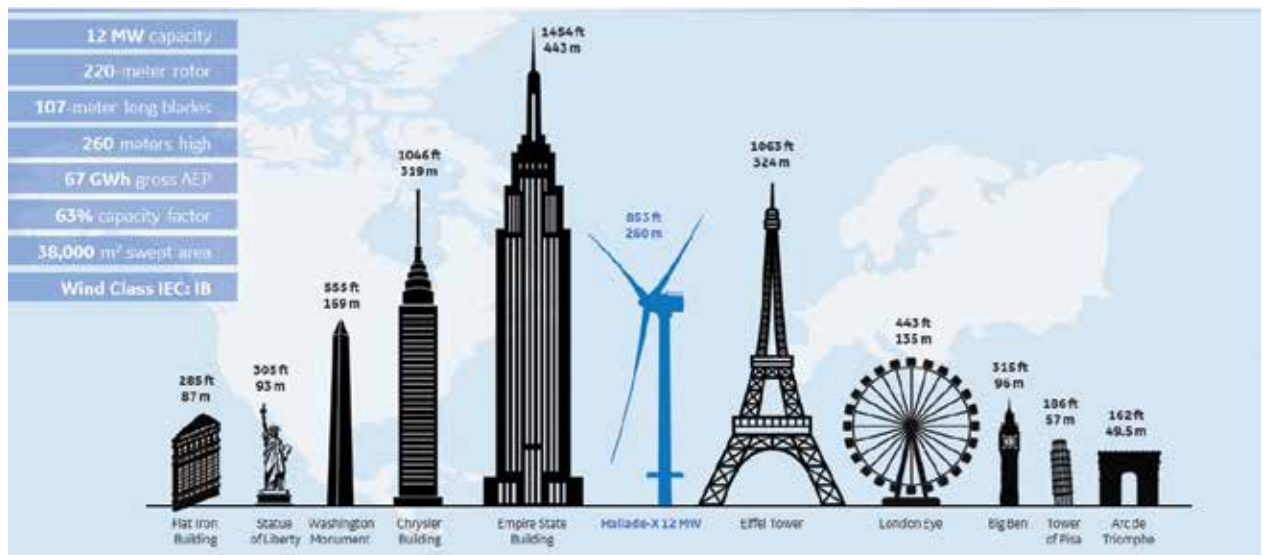
“The Haliade-X 12 MW will help our customers in an increasingly competitive offshore environment, and through its size and digital functionality provide important value across manufacturing, installation and operation.”

digital modelling, analytics and app development. The program is a GE-wide effort.

GE Renewable Energy aims to supply its first nacelle for demonstration in 2019 and ship the first units in 2021. ↘

Source: GE Renewable Energy

For more information, go to www.gerenewableenergy.com



GEV Wind Power continued growth in 2018

U.K. wind turbine blade maintenance specialists, GEV Wind Power, based in the North of England, is set for another year of continued growth and is now in a position to support its expanding order books for both North America and EMEA. This follows the successful fundraise of 1.2 million pounds from large grant applications from both the U.K. and Europe plus further input from their investment partners.

The total grant fundraising for more than 500,000 pounds will see the development for offshore application of the innovative and patented GEV Ventura Habitat — a field deployable temporary environment to facilitate blade maintenance in inclement conditions.

“Demand for the Habitat solution is increasing through interest from industry leading manufacturers, together with deployment on our own USA based projects,” said Alastair Gadney, director of Research and Development Projects at GEV Group. “We are delighted that the innovation is now helping to drive down the cost of blade maintenance. More than 65 percent of our projects are currently deployed offshore and developing the Habitat for this environment will be a natural progression.”

“Innovate U.K. and Horizon 2020 grants help to match our existing significant R&D budget and are crucial to support SME’s like ourselves in helping to drive down the cost of energy,” he said.

The need for infrastructure expansion in the U.S. is brought about by a significant increase in demand for utility scale turnkey blade maintenance solutions. GEV is one of the few ISPs capable of supporting such technically demanding scopes of work and who is prepared to make the necessary investment to support the activity.



GEV Wind Power’s Ventura Habitat. (Courtesy: GEV Wind Power)

“The geographic split of all our projects in the U.S. requires that we invest in our infrastructure appropriately to ensure that our client projects are executed well,” said David Fletcher, managing director of GEV Group. “To scale up and meet the growth potential of our U.S. business requires a significant financial commitment, and it has been encouraging that we have been able to access our existing investor group to support this further expansion in a key geographical market

for our wind division.”

GEV has completed more than 28 individual projects in North America over the past six months, deploying up to 60 blade-repair specialists at the peak. The projects extend over eight states and have been managed from the Group’s office in Austin, Texas. ↴

Source: GEV Wind Power

For more information, go to www.gevgroup.com or www.gevwindpower.com

Ingeteam wins control center contract with Mexican energy company

Ingeteam, an independent global supplier of electrical conversion and turbine control equipment, recently announced it has been awarded a substantial contract by Mexican renewable energy developer Zuma Energía to provide a state-of-the-art control center for its operational wind farm in Oaxaca, PE Ingenio. The platform will collect all the relevant information on the infrastructure of the wind farms in real time, enabling the operator to effectively manage and optimize the operation and maintenance of its wind turbines.

The control center will be the cornerstone of Zuma's asset performance management. It will allow them to gather and analyze a vast array of essential operating data, not only on the wind turbines and substations, but also on the electricity market and the variations of meteorological conditions. The control systems collect the continuous stream of information that each wind turbine generates every second. All key condition parameters, such as temperatures, vibrations, operating conditions, and alarms are monitored and stored in "Big Data" databases optimized to work with large volumes of data in real time in a scalable way. The Control Center will be in the offices of Zuma Energía in Mexico City.

"Currently, Zuma Energía has 725 MW in its portfolio, which were awarded to the company in Mexico's second clean-energy tender held in September 2016," said Zuma Energía's



Ingeteam Zuma Energía Mexico Control Center. (Courtesy: Ingeteam)

CEO Adrian Katzew. "This accounts for a quarter of the tender's total and is a major achievement for our company. It is a privilege to contribute to the sustainable transformation of Mexico's electricity system, benefiting the generations to come."

More than 1 GW of installed wind power in Mexico is being managed through the Ingeteam control center platform. With its maintenance equipment covering almost half of the country's total installed wind-power capacity, Ingeteam has positioned itself as a leader in O&M services in this market. The Spanish company has more than 400 technicians servicing customers throughout the country. Together with Zuma, they aim to continue advancing the industry's optimization of wind farms through

innovative techniques, with the clear ambition of becoming benchmark companies not only in Mexico, but also in the rest of the world.

"We are very pleased to support Zuma Energía in their goal to contribute to the sustainable transformation of Mexico's electricity system," said Jorge Acedo, R&D director of Control Systems, Ingeteam Wind Energy. "The project consolidates Ingeteam's position as a leader in the monitoring and analysis of wind farms in Mexico. Currently, the Ingeteam platform is monitoring and analyzing in real time more than 1 GW of installed wind power in Mexico." ↵

Source: Ingeteam

For more information, go to www.ingeteam.com

EDPR secures a 200 MW PPA for a new U.S. wind farm

EDP Renewables, a global leader in the renewable energy sector, has secured a 20-year power purchase agreement (PPA) with Great Plains Energy to sell the energy produced by the 200 MW Prairie Queen wind farm.

Prairie Queen wind farm is in Allen County, Kansas, where operations are

scheduled to commence in 2019.

Through this new arrangement, EDPR will expand its footprint in Kansas to a total of 600 MW. The company already has locked down 1.5 GW in long-term agreements in the U.S. for projects to be installed through 2016-2020, which represents 82 percent of

the 1.8 GW target capacity additions in the U.S. for that period, as announced at the EDP Group Capital Markets Day in May 2016. ↵

Source: EDP Renewables

For more information, go to www.edpr.com/en