



The project will demonstrate and test new offshore wind power technologies. (Courtesy: Siemens Gamesa)

INNOVATION

Siemens Gamesa, Aalborg University to lead R&D project

Siemens Gamesa Renewable Energy (SGRE) and Aalborg University (AAU) in Denmark will lead the new i4Offshore research and development project focused on significantly reducing the cost of offshore wind power. Officially entitled “Integrated Implementation of Industrial Innovations for Offshore Wind Cost Reduction,” the project is supported by a European Union (EU) grant of nearly 20 million euros. The project will demonstrate and test new offshore wind power technologies, leading to solutions that will make consumers’ electricity bills both lower and more environmentally-friendly compared to fossil fuel sources such

as oil or coal or other renewable energy sources such as solar or hydropower.

A total of 15 project partner companies are involved in the project in addition to SGRE and AAU. They are all experts within the offshore wind industry, and include Universal Foundation A/S, Bladt Industries A/S, Per Aarsleff A/S, Salzgitter AG, Windar Renovables, Dr. Techn. Olav Olsen AS, NKT Cables GmbH & Co KG, SINTEF Ocean, Bureau Veritas Marine & Offshore SA, Maersk Broker K/S, Deugro Danmark A/S, Fred Olsen Windcarrier, Technical University of Denmark (DTU).

“Siemens Gamesa is committed to reducing the cost of offshore wind energy, and greatly welcomes this grant,” said Jesper Moeller, project lead and senior specialist in Offshore Technologies at SGRE’s Offshore Business Unit. “Our constant focus on innovation — along with strong partners, customers, and support such as from the EU — enables

us to push the industry forward, delivering a lower Levelized Cost of Energy (LCOE) and higher annual energy production. The R&D work we’ll do during this project has clear goals of benefiting our customers, ratepayers, and society-at-large.”

AN ENORMOUS ENGINEERING PUZZLE

The i4Offshore project, which is based on classical engineering disciplines such as structural analysis, geotechnical engineering, production, and risk analysis, will test a complete installation of a future version of a full-scale Siemens Gamesa offshore turbine. A new 1,000-ton bucket foundation, a steel jacket, a concrete transition piece, and a new cable connection is intended to prove the technology is reliable, and that production, transport, and installation can be done more cost effectively than today.

“One of the challenges of offshore wind energy is that the high cost of building offshore wind turbines has necessitated various governmental subsidies to improve the business case,” said Lars Bo Ibsen, professor at Aalborg University. “While all forms of industrial power generation receive governmental support, whether from renewable, fossil, or other sources, our project aims at making offshore wind energy even more cost-effective without external financial support.”

The project aims to apply the advanced technologies to reduce the Levelized Cost of Energy (LCOE) from offshore wind. The LCOE calculations show the total cost of electricity from a particular energy technology when all costs are included. But before the project reaches that goal, the various elements must prove they can be integrated into an overall solution.

“We already have a lot of pieces that we know work separately,” Ibsen said. “Now we are in the process of assembling them into a large puzzle, and testing that they work together. As this is proven, we look to demonstrate to customers, banks, and investors that offshore wind makes even more financial and environmental sense for the future.”

MORE THAN 15 YEARS OF R&D

This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No. 818153. With this funding, the partners aim to bring the technology a step further and provide an even more solid foundation for the creation of future offshore wind power plants around the world. The i4Offshore builds on a wide range of projects implemented with the support of both the EU and a number of Danish funding sources over the past 15 years.

Furthermore, the project will test installation solutions with a minimal environmental footprint. The bucket foundation can be installed virtually noise-free as installation takes place via suctioning into the seabed instead

of being hammered down from above.

“Using a suction-bucket foundation benefits whales and other undersea life by eliminating the soundwaves which hammering causes,” Moeller said. “Also, once the wind turbine has exhausted its many years of operational life, the suction buckets, jacket foundation, and transition piece can be decommissioned and removed relatively easily. The materials, including steel, concrete, and cables, can be re-used in a highly resource-efficient manner.”

MORE INFO www.siemensgamesa.com



Vaisala’s suite of premier lightning detection technologies detect both cloud and cloud-to-ground lightning. (Courtesy Vaisala)

INNOVATION

Vaisala launches ability to identify lightning

Vaisala, the global leader in environmental and industrial measurement, including comprehensive lightning data, has developed the capability to distinguish cloud-to-ground lightning strokes that contain continuing

current, the most damaging of lightning strokes. This first-of-its-kind technology offers precision in identifying these strokes, which can last up to 1,000 times as long as a typical lightning stroke and may be more likely to cause fire or other extreme heat-related damage.

“Our patent-pending technique is a game-changer in lightning detection,” said Brooke Pearson, Vaisala’s global solutions manager for lightning. “For the first time, industries where charge transfer from lightning is a threat, including electric utilities, oil and gas, wind farms, and land management organizations, can identify and target the small percentage of lightning strokes most likely to cause asset damage or start fires.”

Vaisala’s suite of premier lightning detection technologies detect both cloud and cloud-to-ground lightning. They include the National Lightning Detection Network (NLDN) in the U.S., which detects cloud-to-ground lightning strokes with a location accuracy of fewer than 150 meters, and the GLD360 global lightning network, which has the ability to detect lightning anywhere in the world.

By leveraging the new data now available from NOAA’s Geostationary Lightning Mapper, Vaisala is able to transform existing NLDN and GLD360 data to provide unprecedented insight to create this innovative capability.

While continuing current strokes account for just less than 10 percent of cloud-to-ground lightning strokes, the sheer number of storms with lightning makes even this small percentage significant. While thunderstorms vary widely in size and intensity, NOAA reports there are roughly 100,000 thunderstorms in the U.S. alone each year, and the NLDN records about 70 million cloud-to-ground lightning strokes in the U.S. annually. That averages approximately 50 continuing current strokes per storm and as many as 7 million per year.

“Whether it’s one, 50, or 100 con-

tinuing current strokes, managing the damage costs time, money, and resources to fix,” said Casey McCullar, head of Lightning Solutions Business for Vaisala. “Knowing precise location information for the most damaging strokes will allow investigation and repair personnel to focus on the areas with the highest likelihood of damage first, making the process much more efficient.”

“This innovation in lightning detection and reporting by Vaisala will enable electric utilities to know not only where lightning has occurred but also where damage to power systems has likely resulted,” said Theo Laughner, president of PowerGrid-RX Inc, an electric utilities consultancy. “This allows utilities to know if repairs are likely necessary before dispatching personnel, thereby reducing outage durations.”

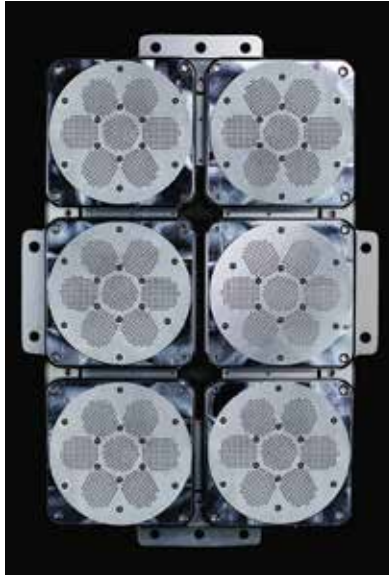
MORE INFO www.vaisala.com

INNOVATION

Bat Deterrent System reduces fatalities by 54% at Texas facility

NRG Systems, Inc., a designer and manufacturer of smart technologies for a range of wind, solar, and meteorological applications, has announced that a trial of its ultrasonic acoustic Bat Deterrent System reduced overall bat fatalities at the Los Vientos Wind Energy Facility in Starr County, Texas, by 54 percent. The results of the test prove that NRG Systems’ technology is an effective tool for reducing mortality of certain species of bats caused by wind turbines. The Bat Deterrent System is based on “jamming” the echolocation capabilities of bats, which they rely on for orienting, foraging, and communication, while causing no harm to wildlife that encounter the treated airspace.

The test was led by researchers from Texas State University in partnership with Bat Conservation International (BCI), and involved installing NRG’s



The Bat Deterrent System from NRG Systems. (Courtesy: NRG Systems)

Bat Deterrent Systems on 16 of the facility’s 255 turbines.

“It is no secret that wind turbines cause mortality to bats,” said Brogan Morton, senior product manager at NRG Systems. “This has become an increasingly critical issue as bat populations across North America continue to decline. NRG set out to develop a technology that would allow wind developers and operators to protect bats while creating more energy more of the time. We are incredibly pleased to say that we are well on our way to making this a reality.”

“Our results from a robust, two-year study at an operational wind-energy facility in Texas indicate NRG’s acoustic deterrents significantly reduce Brazilian free-tailed bat and hoary bat fatalities,” said Sara Weaver, doctoral candidate at Texas State University, and biology lecturer at A&M, San Antonio, who led the Los Vientos study. “Based on these results, the technology is a promising tool for reducing bat fatalities at wind turbines.”

While 2018 marks three years of testing for NRG’s Bat Deterrent System, research around using ultrasonic acoustic deterrents to reduce bat fatalities at wind turbines has been underway for more than a decade. This

was led by The Bats and Wind Energy Cooperative (BWEC), an organization that BCI helped launch and continues to coordinate.

“BCI is proud to partner with companies like NRG Systems — entrepreneurs looking to reduce bat fatalities at wind turbine sites,” said Mylea Bayless, senior director of Network & Partnerships at BCI. “We hope that future testing shows continued mortality reduction in additional species and that NRG’s Bat Deterrent System will serve as a highly effective tool for wind developers and operators looking to minimize their impact on bat populations.”

MORE INFO nrgsystems.com

CONSTRUCTION

Boskalis wins contract for Ostwind 2 grid connections

Royal Boskalis Westminster N.V. (Boskalis) has been awarded a sizable export cable installation contract for the Ostwind 2 offshore grid connection.

The contract was awarded by 50Hertz and carries a value for Boskalis in excess of 250 million euros, making this the largest cable installation contract acquired by Boskalis ever.

The contract scope comprises design and installation of approximately 270 kilometers of export cable that will connect the planned Arcadis Ost 1 and Baltic Eagle offshore wind farms to the onshore substation in Lubmin, Germany. The project is expected to begin in 2019 with a planned completion late 2022.

Boskalis will execute this contract in consortium with its partner NKT that will supply the high-voltage cable system. For this project, Boskalis will deliver an integrated solution of in-house services including supporting UXO survey, geotechnical, and geophysical surveys (through Boskalis subsidiary Gardline), seabed preparation works, pre-lay run, transport, and installation of the 220kV export cables