



The electrical substation at the Arkona offshore wind farm is fully automated and is designed to be able to manage the wind farm autonomously. (Courtesy: Chantiers de l'Atlantique)

## ► CONSTRUCTION

### CdA becomes key player of the European energy transition

Chantiers de l'Atlantique (CdA), one of the leaders in European maritime industry, is associated with the official inauguration of the Arkona offshore wind farm, April 16 on Rügen Island (north-east of Rostock), in the presence of Angela Merkel, federal chancellor of Germany and many other personalities.

The offshore wind farm consists of 60 wind turbines rated at 6-plus MW each, developed by the German energy company E.ON and the Norwegian company Equinor (formerly Statoil).

They are connected to the electricity network by the German transmission system operator 50Hertz. Chantiers de l'Atlantique, through its Atlantic offshore energy business unit, designed, built, installed, and commissioned the largest electrical substation ever built in a single module. With a weight of more than 4,000 metric tons and a capacity of 385 MW, the substation transfers the carbon-free electricity produced by wind turbines to the equivalent of 400,000 households in Germany.

Electrical substations are key elements for the operation of offshore wind farms. These structures, often weighing more than 2,000 metric tons, transform the electricity produced by the wind turbines and can transfer it up to 100 kilometers to land. They

also serve as relays for remote control of the wind farms. Fully automated, they are designed to withstand extreme marine environments, with the easiest possible maintenance.

Ordered in June 2015, the substation consists of a topside 50 meters long, 35 meters wide, and 15 meters high. It was designed and built by Chantiers de l'Atlantique in Saint-Nazaire (Loire-Atlantique), then transported in February 2018 by barge to its installation location in the Baltic Sea, about 35 kilometers off the coast of Rügen Island.

This “smart,” fully automated substation is designed to be able to manage the wind farm autonomously, without human intervention, thanks to a large electronic PLC system.

Chantiers de l'Atlantique also pro-

vided the foundation for the substation, a 53-meter high jacket structure with a total weight of 1,800 metric tons. The unit was delivered ahead of schedule and commissioned and to the customer in the summer of 2018.

This “turnkey” project, completed in record time, testifies to the excellent cooperation between the German, Norwegian, and French experts in marine renewable energy. It also reflects the expertise of the teams at Chantiers de l’Atlantique, who applied the processes and technologies learned through building large complex ships to design this substation, achieving weight savings of about 20 percent on the metal structure, which significantly reduced construction costs and facilitated the installation.

**MORE INFO** [www.chantiers-atlantique.com](http://www.chantiers-atlantique.com)

## CONSTRUCTION

### Eurowind Energy picks Siemens Gamesa for Denmark wind project

Siemens Gamesa has signed an order with Eurowind Energy for Thorup-Sletten, the largest onshore wind farm in Denmark to date. The 18 onshore turbines will have a total capacity of 77 MW and an electricity production equivalent to the average annual consumption of approximately 65,000 households.

“We are proud of being the developer behind the largest onshore project in Denmark,” said Jens Rasmussen, CEO for Eurowind Energy. “This is yet another proof that onshore wind should continue to be an important part of the energy mix to keep Denmark at the forefront when it comes to wind energy. We have chosen Siemens Gamesa because we looked around in the market to find a turbine that is both a great match for these very windy conditions and can deliver high product quality and a highly competi-



The Thorup-Sletten wind farm will feature 18 turbines from Siemens Gamesa. (Courtesy: Siemens Gamesa)

tive price. The upgrade of the turbine from 3.6 to 4.3 MW together with the 130-meter rotor was important to get the lowest cost per KWh produced.”

The installation of the Thorup-Sletten wind farm, west of the Aggersund bridge in northwestern Jutland, will start in October of this year. Siemens Gamesa will also be responsible for

service and maintenance of the wind farm for 20 years through a long-term service program tailored for Eurowind.

“Of course it means a lot to us to win this bid from Eurowind and to be able to continue driving the transformation to renewables in Denmark,” said Steven Pryor, Siemens Gamesa’s Onshore Business Unit CEO for North

**DON'T BE LET DOWN BY AN ELEVATOR**

Installation and preventative maintenance by IUEC elevator mechanics will keep your elevators moving SAFELY and more efficiently.

27,000 trained craftspersons using more than 119 training centers.

Contact Carisa Barrett at [cbarrett@eiwfpf.org](mailto:cbarrett@eiwfpf.org) or 253-561-4902

We represent more than 450 elevator companies ready to serve your Elevator Lift needs

Europe and Middle East. “We are constantly working to offer innovation, technology, and solutions tailored to the needs of the individual customer.”

**MORE INFO** [www.siemensgamesa.com](http://www.siemensgamesa.com)

## CONSTRUCTION

### Pfisterer will supply a 52-KM underground cable system

Westnetz, one of Germany’s largest distribution network operators, is building a 17-kilometer underground cable system in Hunsrück as part of its efforts to support the transition to renewable energy. This new high-voltage cable will transport renewable wind power from turbines at Hunsrück to the region’s urban centers. Pfisterer is supplying the entire 110 kV cable system with a total cable length of about

52 kilometers together with the cable accessories, as a turnkey system.

Westnetz, the distribution network operator for the Trier region and a subsidiary of Innogy, views the 19 million euro project as an investment in transition to renewable energy in Rhineland-Palatinate. Its existing distribution network in Hunsrück is now operating close to capacity due to the rapid growth of renewable energy generation. Consequently, surplus wind energy will soon be transported from a substation in Thalfang (110 kV) through a 17 kilometer renewable energy connection to a substation in Osburg.

“We are delighted to be continuing our partnership with Westnetz, a long-term customer, on this key project for the 110-kV distribution network, and thereby contributing to the transition to renewable energy in Rhineland-Palatinate,” said Vukasin Basara, senior manager of Underground Cable Projects with the PTS Cable business unit

at Pfisterer. “This is Pfisterer’s largest order for HV AC underground cables and demonstrates our customer’s trust in our experience and expertise in handling complex high-voltage underground cable projects.”

To support the installation, trenches 1.5 meters deep and 1.7 meters wide will be dug along the 17.3-kilometer route, which will run predominantly along rural roads and over public land. According to Westnetz, this is the longest underground cable they have ever installed. Pfisterer is supplying the complete cable system as a turnkey solution. Initially, three cables will be installed in parallel conduits, but three additional empty conduits also will be installed to allow for future expansion. Installation of the underground cable, with a combined total length of 52 kilometers, will begin in early 2020. Fiber-optic conductors will be integrated into the cable screen, and two conductor cross-sections, one 1,200 square millimeters and the other



## WIND TURBINE MAIN SHAFTS

Fusion Inc. can assist you with repairing of bearing journals, seal areas and coupling fits on wind turbine main shafts with our large capacity lathe, grinders and HVOF coating systems. We can perform incoming inspection, level II NDT-Inspection, lathe machining, HVOF coating and finish grinding in-house. To be repaired ODs can be HVOF coated with up to .020" per side of coating thickness and ground back to standard OEM size/finish.




6911 FULTON ST HOUSTON, TX 77022 PHONE 713-691-6547 FUSIONHOUSTON.COM



SEE US AT BOOTH 3630

1,800 square millimeters, will be used to achieve the required transmission capacity.

**MORE INFO** [www.pfisterer.com](http://www.pfisterer.com)

## INNOVATION

### NRG's Bat Deterrent System reduces bat fatalities by 67 percent

A trial of NRG Systems' Bat Deterrent System at the Pilot Hill Wind Project in Illinois yielded an overall reduction in bat fatalities of 67 percent and greater reductions with species commonly affected by wind projects.

The results of the trial were announced on March 27, 2019, by EDF Renewables, the developer/owner of the Pilot Hill Wind Project, at the AWEA Wind Project Siting and Environmental Compliance Seminar in



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

Albuquerque, New Mexico. Located in Kankakee and Iroquois counties, the 175-MW Pilot Hill Wind Project was made possible by a 20-year power pur-

chase agreement with Microsoft Corporation and has been in commercial operation since 2015.

Testing of NRG's ultrasonic acoustic Bat Deterrent System was conducted at Pilot Hill between August and October of 2018; 15 out of the facility's 103 turbines were outfitted with Bat Deterrent Systems. A 5.0 m/second cut-in speed curtailment was simultaneously applied at the deterrent-equipped turbines.

"Our goal with this trial was to gauge the efficacy of combining curtailment with NRG's Bat Deterrent System to reduce bat mortality at wind turbines," said Michael Azeka, director of Environmental Strategy at EDF Renewables. "The results of this trial are very encouraging and suggest that this approach to minimizing bat impacts is a compelling one."

**MORE INFO** [nrgsystems.com](http://nrgsystems.com)

## INNOVATION

### ONYX: Operators must embrace disruptive technologies

Embracing disruptive digital technologies for the collection and analysis of wind-turbine data offers the best route to reducing the costs of operations and maintenance programs. This is according to more than half (55 percent) of the asset and operations managers attending ONYX InSight's European Technical Symposium in March. Disruptive technology is entering the wind-energy sector quickly and helping to improve the cost-basis for running wind-turbine maintenance programs. From micro-electro mechanical sensors (MEMS) for gathering turbine data to machine learning algorithms that improve data analysis, owners and operators of wind farms in Europe need to embrace these technologies to maintain their position in the industry.

**MORE INFO** [www.onyxinsight.com](http://www.onyxinsight.com)



## Building stators and rotors for wind power



Sotek/Belrix is a global supplier of motor and generator components, and integrated value added services. We manufacture up to 5 ton rotor or stator assemblies.

# SOTEK

716-821-5961

[www.sotek.com/power-generation](http://www.sotek.com/power-generation)



Made in the USA



The Digital Twin increases operation and gives the ability to simulate, plan, and solve complex solutions within a digital environment that replicates the real one. (Courtesy: Ericsson)

### INNOVATION

## Ericsson and Comau show 5G Digital Twin at Hannover Messe

Ericsson and Comau recently showed the Digital Twin enabled by the 5G connectivity to the Hannover Messe. This innovation project, which is being tested, represents a further step in the long-lasting partnership between Ericsson and Comau aimed at developing new use cases and solutions for Industry 4.0 and Smart Manufacturing, thanks to the potential offered by the fifth-generation mobile technology.

Comau and Ericsson showed the digitized version of an assembly line in an automotive plant. Using special glasses for virtual reality applications, visitors were immersed in the line and could “move” within it, monitoring the key parameters of the processes and of the machines, such as vibrations, temperature, pressures, and absorptions. A virtual reality digital dashboard, which can be used with a standard tablet, will identify situations that could create slowdowns or interruptions in the process by providing instructions to tackle the problem effectively.

The features of 5G connectivity allow a collection of a stable, continuous, and massive flow of data in

real-time that is vital for automation processes.

MORE INFO [www.ericsson.com](http://www.ericsson.com)

### INNOVATION

## Geo-location mapping project crosses 100K turbine milestone

An ambitious project led by IntelStor to map the geo-locations of every wind turbine in the world has hit a major milestone.

IntelStor has now completed the geo-location mapping of 107,902 out of 355,793 onshore and offshore wind turbines in the world, spanning 38 countries so far. This project enables IntelStor to remove ambiguity over the global installed base of wind turbines and provide the most accurate market intelligence to the industry. To date, this includes more than 24,500 offshore wind turbines and 83,400 onshore wind turbines including decommissioned, operational, under construction, consented, and proposed assets.

This IntelStor-led project to clean and scrub the data provided by governments and industry trade associations increases the precision in the data sets. Some publicly available data for wind-turbine geo-locations includes non-wind turbine structures, such as

**MANKIEWICZ**  
Coating Concepts of the Future

Whether you need a system for wind blade production or repairs, come by and learn how Mankiewicz can provide your complete coatings solutions.

**AWEA WINDPOWER**  
Houston, TX • May 20 - 23, 2019

**Booth # 3503**

North America: +1 (843) 654 7755  
Europe: +49 (0) 40 / 75 10 30

**[www.mankiewicz.com](http://www.mankiewicz.com)**

met towers, cellphone towers, or other tall structures. Additionally, this research has identified missing turbines from published datasets as well as inaccurate labeling of wind turbines that have been subsequently decommissioned.

Removing these inaccuracies from data sets, which includes the U.S. Geological Survey and Federal Aviation Administration database in the United States, the Danish Energy Agency master data register, WindStats data sets in the Netherlands, and INEGI in Portugal, is of the utmost importance to ensure accuracy in global market statistics. Industry reliance on accurate data for historical market statistics as well as future market projections is imperative.

**MORE INFO** [www.intelstor.com](http://www.intelstor.com)

#### MAINTENANCE

## O&M jack-up vessel to join the Fred. Olsen Windcarrier fleet

Fred. Olsen Windcarrier has signed a long-term time charter with Falcon Global for their jack-up vessel Jill. The jack-up vessel will be an integrated part of the Fred. Olsen Windcarrier jack-up fleet for offshore wind, where she will be under commercial management of Fred. Olsen Windcarrier. She will be working out of Europe and carry out O&M work in offshore wind.

The vessel was scheduled to commence work in Europe in mid-April 2019. Jill's first job in Europe will be suction-bucket installation tests out of Frederikshavn in Denmark together with Universal Foundation. The first contracts for main component exchanges will be shortly after arrival.

"With Jill joining our fleet, Fred. Olsen Windcarrier can provide a competitive vessel to the O&M market for the 3-5 MW offshore wind turbines," said Casper Toft, chief commercial officer with Fred. Olsen Windcarrier. "Jill is capable of servicing up to 80 percent of the installed offshore wind base,

and we look forward to showing the offshore wind market what this vessel is capable of. Apart from using her for major component exchanges within O&M, she can, among other things, also be used for offshore accommodation and for blade transportation."

**MORE INFO** [www.windcarrier.com](http://www.windcarrier.com)

#### MAINTENANCE

## Renewable energy industry gets training boost

Altitec, a leading provider of wind-turbine rotor-blade repair and maintenance services and technician training, recently opened an Altitec Academy in Australia. The first training course was scheduled for May 7-17, 2019, offering essential skills to develop a career in the wind-energy sector.

Investment in the Australian renewable energy market doubled from \$10 billion AUD in 2017 to \$20 billion AUD in 2018, and wind energy is the second largest source of renewable power in the region, closely following hydropower. This means that in 2018, wind provided enough energy to power 3,518,452 homes in Australia.

While renewable energy capacity in Australia continues to grow, further investment is needed to support the development of skills appropriate to the market as more and more local workers seek sustainable careers in a thriving and future focused industry.

**MORE INFO** [www.altitec.co.uk](http://www.altitec.co.uk)

#### MANUFACTURING

## Vestas receives 143-MW order in the U.S.

Copenhagen Infrastructure Partners (CIP) recently placed an order for 143 MW of V126-3.45 MW turbines for the

Bearkat II Wind project in Texas.

Bearkat II is the second phase of the Bearkat project, following the successful 2017 commissioning of the Bearkat I project, which also featured V126-3.45 MW turbines. Including previously purchased components, the project will have a total capacity of 162 MW.

Deliveries are expected to begin in the third quarter of 2019.

**MORE INFO** [www.vestas.com](http://www.vestas.com)

#### MANUFACTURING

## Han-Eco<sup>®</sup> B offers compatibility with metal connectors

HARTING multiplies the possible uses of plastic connectors with the new Han-Eco<sup>®</sup> B series. The Han-Eco<sup>®</sup> range now includes plastic housings that are fully compatible with the standard Han<sup>®</sup> B. This means that Han-Eco B plastic connectors can be mated with Han B metal connectors. This opens up the entire portfolio of Han B inserts for Han-Eco. Another key improvement is the rear-mounting option for prefabricated cabinet harnesses.

The rear-mounting feature has been a demand from the industry for many years and is now realized in the Han-Eco B series. This feature simplifies the assembly process as the insert side of the wiring harnesses can be easily snapped into the bulkhead mounted housing from the inside of the switch cabinet — rearward.

This simplifies the assembly as well as allows assembly floor optimization by providing the ability to stock the internal wire harness pre-cabinet assembly, thus saving time and costs. Now that a switch cabinet unit and its cable harness can be pre-assembled separately, a better division of labor is possible and, if necessary, processes can even be outsourced. ✎

**MORE INFO** [www.harting.com](http://www.harting.com)