INNOVATION

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Technological advances to take center stage this month at WindEnergy Hamburg

International exhibition in Germany will showcase state-of-the-art products and projects

This month, the international wind energy industry will gather at the WindEnergy Hamburg fair. More than 1,000 companies hailing from over 30 different countries will be present at the leading international wind energy industry fair to showcase their latest products, service offerings and projects for both onshore and offshore wind power. For four days, eight halls at the Hamburg fair site will provide exhibitors and industry visitors with an opportunity to get the full picture of all the latest technologies from every segment of the value chain. This is a selective preview of some of the innovations and developments from the wind energy world, which have been announced for the leading global industry fair at the 'wind capital' of Hamburg.

Developments in the large turbine segment

MHI Vestas Offshore Wind, Gamesa with its Joint-Venture partner Areva, and the German engineering consultancy aerodyn (SCD) will all inform

the visitors of WindEnergy Hamburg about the latest status of their product developments in the 8MW class. Unlike the quasi-standard three-blade upwind configuration, SCD's offshore solution is a two-bladed downwind SCD 8.0 turbine installed on a floating base. A company spokesperson commented this approach: "Our overall turbine-and-floater concept offers specific benefits in terms of instant load reduction. We will reveal further details at WindEnergy Hamburg."

Floating wind turbine technology is evolving at a much faster pace than many had expected just a few years ago, and there is a broad variety of design concepts. One innovative example is the GICON-SOF tension-leg platform. According to the engineering consultancy GICON, it is suitable for water depths from 20 up to 500 metres. A prototype project with a 2.3MW Siemens turbine is to be erected in the Baltic Sea by May 2015. According to the manufacturer the design is scalable to at least 6MW.

Component suppliers on track

A novelty in the 6MW class is Senvion's 6.2M152 geared turbine with an enlarged rotor. A prototype is currently under construction. Meanwhile major component suppliers are stepping up their efforts to match the latest supply chain demands ranging from blades to castings, drive trains, towers and support structures. VEM Sachsenwerk, likewise exhibiting at the leading industry fair in Hamburg, now offers both asynchronous and synchronous generators for power ratings up to 7MW. EEW Special Pipe Constructions has built one of the world's first XL-type monopile towers with a 10-metre outer diameter. The tower can carry 6-7MW turbines with 150 metre and larger rotors, and be installed in water depths of up to 40 metres.

Mechanical drive train specialist Winergy (Siemens) has delivered two 3MW prototype units of its new medium-speed "HybridDrive" solution to German technology developer Wind-to-Energy (W2E). W2E will be represented at WindEnergy Hamburg, as well. Supplier FWT is marketing the product under license as its flagship model for IEC class II sites under the model name "FWT 3000."

Innovative gearboxes

Winergy will display a further (optional) product development of this semi-integrated drive system at WindEnergy Hamburg. It consists of a two-stage

planetary gearbox with a flange-on permanent magnet generator design. What makes this system unique is the use of journal or plain bearings in both gear stages with the exception of the planetary carriers which are fitted with conventional roller-type bearings. Equally new is the use of journal bearings for the generator. The HybridDrive displayed at the fair will be partly cut open so visitors can take a closer look at the internal components. Winergy will inform visitors about all the benefits of using journal bearings. Another product development by Winergy shown at WindEnergy Hamburg will be a 2MW, three-stage, high-speed gearbox likewise fitted with journal bearings. A prototype unit installed in a Vestas turbine has been field tested for over 16 months at a cold-climate site in Scandinavia. A complete journal bearing arrangement will be on display at the company booth.

Wikov MGI of the Czech Republic will exhibit its range of wind turbine gearboxes incorporating flexible pins and a differential split torque arrangement, which according to the supplier combine an increased torque rating with reduced size and mass characteristics.

Onshore turbines from 3 to 5MW and above

Several international exhibitors will inform WindEnergy Hamburg visitors about their latest 3MW+ class onshore turbines. One such product designed for IEC class III sites is Senvion's 3.0M122 turbine. The first commercial units will be installed this year. Another new IEC III-type turbine model is the Nordex N131/3000 featuring a record 131-metre rotor diameter, the largest in its class.

Several suppliers have also announced new, higher rated onshore turbines in the 3.2 - 5MW range. Project developer and turbine supplier eno Energy will present its new eno 126 | 3.5MW model, and XEMC Darwind is developing a 4.5MW turbine for high-wind onshore sites. Earlier this year Enercon announced a new turbine model ranging between the current 3 - 7.5MW offerings.

U.S.-based AMSC Windtech develops and licenses turbine models up to 5.5MW to third-party clients. AMSC's latest product development is a 2MW geared turbine model with a 113-metre rotor for IEC class III sites, available in a full converter solution with either a double-fed induction generator or a synchronous/asynchronous generator. Says Kerry Farell, senior manager of corporate communications: "Our newest design has one of the largest rotor diameters in the industry. The market is moving towards low wind areas. In low wind speed areas we are able to implement a much bigger rotor diameter, which is also enabled by advanced controls on basically the same wind turbine. This helps to increase the AEP while lowering the Cost of Energy for a variety of markets, from regions that are already saturated to new emerging regions with lower overall wind speeds." Farell added that AMSC is working with a licensee to build a prototype and is looking for additional licensees.

Taller towers, high-precision instruments

Several tower suppliers will showcase their latest product developments in Hamburg. For example, Germany's Drössler Umwelttechnik will inform about its innovative prefabricated tower solution called Ventur for up to 120-metre hub heights in full concrete, and for 200-metre hub heights in concrete/steel hybrid versions.

Accurate wind measurements are another field of expertise receiving growing attention within the wind energy industry. WindEnergy exhibitor ROMO Wind will present an innovative, patented measuring and monitoring solution called iSPIN, consisting of three stationary ultrasonic devices without moving parts, mounted to a rotating spinner at 120-degree inner spacing. According to the manufacturer, this solution enables effective measurement of both the wind speed and wind direction, with much greater precision than nacelle-mounted systems.

Energy storage solutions

Storing renewable energy in a cost-effective, reliable and efficient manner is one of the remaining key challenges for a successful transition from fossil and nuclear-based power generation towards renewable energy sources such as wind. Enercon, GE, Siemens and other manufacturers will highlight their latest battery-based and other energy storage solutions at WindEnergy Hamburg, and inform visitors about specific benefits and challenges ahead.

WindEnergy Hamburg will be held September 23-26. Organizers expect more than 1,000 exhibitors from all parts of the world. The event will be held at the Hamburg Fair site every two years. In addition, the wind exhibition with a focus on the national market, HUSUM Wind, will be held in Husum from 15 to 18 September 2015, likewise organized jointly by HMC and Messe HUSUM, as a biennial event.

For further information please visit windenergy-hamburg.com and husumwind.com.

— Source: WindEnergy Hamburg

Siemens D6 turbine obtains type certification by DNV GL

Siemens Energy has obtained type certification by certifying body DNV GL for the company's innovative D6 offshore wind turbine. The model Siemens SWT-6.0-154 is equipped with a modern direct drive generator, rated at 6 MW and equipped with a 154-meter rotor. The official certificate is a further step in ramping up the serial production of the turbine. The certification process included DNV GL experts being given full access to the engineering and Siemens assembly facilities in Brande as well as testing facilities at Oesterild, Denmark and Hunterston, UK. Evaluation included an assessment on the maturity of the turbine design, its manufacturing, installation and commissioning processes and related documentation.

The development of the SWT-6.0-154 marks a significant step towards reducing the cost of energy. With a tower head mass of only 360 tons, the new 6-MW machine is around one third lighter than comparable systems. This weight advantage provides improved economic viability across all project phases, from assembly to transport, foundations and installation all the way up to operation. One SWT-6.0-154 turbine can supply up to 6,000 households with clean offshore wind power. This type certification for the SWT-6.0-154 includes a 25 year design lifetime, which is an additional five years compared to the previous turbine lifetime that Siemens has designed.