

## Smart Energy at WindEnergy Hamburg: World's leading wind industry expo to showcase future of wind energy production, integration and storage

Hamburg, 1 August 2018 – The urgency to drive down turbine product lifecycle costs and in parallel combine wind with other smart energy solutions has become key wind industry topic. From 25 to 28 September the Global Wind Summit will highlight the future of wind energy production, its integration and storage as well as sector coupling projects. This is a huge overall challenge requiring sustained wind industry R&D efforts, from advanced concept studies to smart turbines, rotor blades, and control systems. Smart energy extends to digitalization of supply-chain processes, use of big data for asset upkeep, smarter O&M, mid-life upgrades and lifetime extension. Digitalization at practical level involves for instance the continuous monitoring of critical loads in main components like gearboxes for determining remaining lifetime. Smart Energy is one of the top items on the agenda of WindEnergy Hamburg, the world's leading expo for wind energy, which has joined hands with WindEurope's global conference to form the Global Wind Summit. 1,400 exhibitors from 40 countries will present their innovations in nine halls of the Hamburg Messe site.

### Sensor-based smart wind power

The use of sensors in 'smart' modern wind turbines is increasing, but how can digitalization lead to optimization? Different sensors are used for recording vibrations, temperature variations, generator airgap (roundness) values, component displacement under load, etc. Sensors incorporated in turbine main component areas include towers, gearboxes, generators, and rotor blades, and contribute to smarter energy production by providing essential operational inputs to asset owners/operators. Many WindEnergy Hamburg exhibitors will inform visitors on how smart use of sensor-based data does boosts asset performance and reliability, and ultimately LCOE.

Germany's Bachmann Monitoring will display a new Blade Unbalance Calculator (BUC), a Condition Monitoring System (CMS) plug-in at WindEnergy Hamburg. The BUC-principle includes a tower sensor at the nacelle centre. The system distinguishes between aerodynamic and mechanical effects, enabling correct timely remedying actions. "A 2015 Whitepaper by Wind Industry Deutschland (WID) indicates that up to half of wind turbines suffer from an undue rotor", said Bachmann Monitoring product manager at David Futter: "The implications of undetected unbalance are severe: increased structural fatigue loads for the tower, nacelle, and drivetrain components. Regular blade balance quality estimates enable plant owners to target those wind turbines where balancing significantly improves operational life."

Another key sensor application is in the blade root of large onshore/offshore turbines for measuring actual blade loads real-time during individual rotor revolution. Such load-based Individual Pitch Control systems are characterized by high pitch frequency, accelerating pitch bearing wear. Some

OEM's as a counter measure switch to three-row roller-type pitch bearings from specialists like WindEnergy Hamburg exhibitors IMO and Rothe Erde. Danish Mita-Technik will highlight technology that monitors and manages blades movement and loads with IPC-based solutions.

Leading gearbox suppliers ZF Windpower and Winergy will explain on their latest advances regarding intelligent gearbox development. These combine mechanical engineering and power-electronic know-how with digital technologies, powerful computers and internet-based communication portals. Big data inputs from weather stations and electricity markets in parallel allow optimal timing for service/repair and/or component exchange activities. Big data from own turbine fleets could also be deployed for cross-brand asset upkeep services.

Chinese gearbox supplier NGC Group showcases its own intelligent gearbox technology. Liu Zhaohui, aftermarket vice director said: "WindEnergy Hamburg is a major global wind event and the perfect platform to present our latest innovation, NGC's Smart gearbox. This integrated smart solution combines a condition monitoring system, a NGC App, and internet-based big data management. Having direct data exchange with the customer, allows us proactive advice, while the customer benefits from our expertise and essential in-house gearbox technical data."

### **Storage Tour at WindEnergy Hamburg**

Energy storage is a key enabler for the ongoing transition towards renewables. At the world's leading wind industry expo, the "Storage Tour" will pinpoint all exhibitor stands offering EE storage-related solutions in all exhibition halls. Visitors can easily find them with the help of the Visitor Guide or the app, or in the online exhibitor directory. Storage systems range from Lithium-Ion batteries, to HydroRedox fluid batteries, compressed-air, power-to-gas, and power-to-liquid. An alternative solution by Siemens Gamesa converts electrical energy into heat stored in an insulated container filled with rocks, while a steam turbine converts heat energy back to electricity.

A smart energy hybrid system example like promoted by Vestas is a combination of wind and solar, coupled to storage. Another option is to expand this with electric vehicle charging. Enercon will explain WindEnergy Hamburg visitors on its latest bi-directional E-Storage 2300 power conversion solution that enables rapid energy feed-in and release from battery storage systems. It follows the electric vehicle E-Charger 600 introduced earlier this year, which the company called 'a new building block of an ecosystem built around turbine core products.'

A sector coupling variant is the Renewable Energy Cluster Hamburg (EEHH) initiative that wishes to broaden renewables use beyond the electricity sector through adding mobility and thermal energy intensive industries like Trimet aluminum smelter. The leading principle is sharing energy between these three sectors, said EEHH director Jan Rispens. On the latest NEW 4.0 energy transition project initiated for Northern Germany he said: „NEW 4.0 is important for the wind sector as well as large regional power consumers, and will provide a blueprint for future power market developments." A major role is for utilities and TSO's through retaining network stability with increasing volumes of renewable power especially wind, solar, biomass, and geo-thermal. "WindEnergy Hamburg and WindEurope Conference under one roof is a major event where EEHH will provide workshops on international wind markets, and present NEW 4.0 to an international audience. We will also announce all high-profile "German Renewables Award" winners in five categories", said Rispens.

### **Varied programme at WindEurope Conference**

Smart Energy and Digitalisation will feature prominently at the WindEurope global conference, as well, which is held from 25 until 28 September in parallel with WindEnergy Hamburg. During the first two days, the conference programme will include expert presentations on subjects such as “Electrifying heating and cooling in buildings”, “Using digital technologies to control turbines”, or “The impact of digitalisation on cost reduction and business models”. For further information about the conference programme please visit [globalwindsummit.com](http://globalwindsummit.com)

### **WindEnergy Hamburg and Husum Wind**

The Global Wind Summit will be held in Hamburg, the capital of the wind industry, from 25 to 28 September 2018. At WindEnergy Hamburg, roughly 1400 exhibitors from around the world will present their product innovations and projects. The world’s leading wind industry expo for the onshore and offshore wind industry mirrors the global market and its entire value chain. In parallel, WindEurope will hold the Global Onshore and Offshore Conference in the halls of Hamburg Messe. The world of wind energy gathers in Hamburg for the Global Wind Summit every two years. At its partner event, HUSUM Wind, the Who's Who of the German wind industry will meet for the following year’s most important German wind trade fair from 10 to 13 September 2019. From global market leaders to business pioneers and innovative start-ups, onshore and offshore businesses will be showing cutting-edge technology, product trends and examples of best practice from Germany and the neighbouring EU countries. For further information please visit [windenergyhamburg.com](http://windenergyhamburg.com) and [husumwind.com](http://husumwind.com)

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