

3 MW SUPERCONDUCTING WIND POWER GENERATOR – PROJECT ECOSWING SUCCESSFULLY COMPLETED

THEVA demonstrates reliability and performance

Ismaning, 7th May 2019 – THEVA, a company based in Ismaning near Munich, has designed and delivered superconducting coils for the EcoSwing wind power generator. The turbine in Thyborøn, Denmark, has now reached its target output of 3 MW and the project is officially completed – successfully. The turbine delivered power to the grid for over 600 hours. Dr. Werner Prusseit, Managing Director of THEVA, is pleased: "Superconductors have become an indispensable technology for future energy supply. 40 percent lighter with the same performance - this wind turbine is a landmark."

Just as in aircraft construction, weight is a very important factor for large wind turbines. The use of superconductors can reduce weight while maintaining the same power as standard generators. Furthermore, the electrical resistance of superconductors is close to zero, enabling a reduction in conductor cross-section. "A promising alternative for developing a new generation of wind power plants", confirmed the Fraunhofer Institute for Wind Energy Systems (IWES) in a press release.

The EcoSwing generator was successfully tested at IWES in Bremerhaven last March. After commissioning and installation in Thyborøn, Denmark, the last milestone was reaching 3 MW of power output. The cryogenic cooling system, which cools the superconducting coils down to minus 240 degrees Celsius, as well as the superconducting coils, have proven to be particularly robust and reliable – under real conditions. The cooling system of the wind power generator was stable over seven months of operation. This is a major step for series maturity.

Looked at in detail, the 3 MW generator has 40 coils. Each coil is about 1.4 meters long and 0.2 meters wide, which adds up to around 25 km of superconducting wire, explains Dr. Markus Bauer, VP Business Development at THEVA. This corresponds to about a quarter of current annual production capacity at THEVA.

There are yet a few steps that need to be taken for the breakthrough of superconductors in wind power plants. The next step will be a small series production run to gain experience in continued operation. THEVA sees a good chance that superconducting generators can reach a relevant market share for big wind turbines in the future.

THEVA is pursuing several goals with their first series production of superconductors in Germany. On the one hand the cost of superconductors need to become competitive with

copper. On the other hand, this technology facilitates the necessary innovation and progress in energy supply and drive technology. Accordingly, THEVA has a portfolio of superconductors tailored to the needs of various applications.

“Basically, anything is possible”, says Bauer. “Generator manufacturers can wind coils in different sizes, geometries and performance levels with our material”. Superconductors have the benefit of reducing size and weight to an extent not otherwise possible. As a result, costs are lower for foundation, supporting structures, installation space and logistics.

The increasing interest in superconductors from different industries is driving standardization efforts. The international electrotechnical commission (IEC) and the German Commission for Electrical Technologies (DKE) are working on it. “THEVA is a representative from Germany on the committee”, Bauer explains, adding “We aim to put in place international standards for 2nd generation superconductors with regard to critical current and mechanical properties”.

Further information about EcoSwing can be found here <https://ecoswing.eu/>.

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About THEVA Dünnschichttechnik GmbH:

With 20 years’ experience in coating technology and equipment engineering, and patented production technology, THEVA manufactures high-temperature superconductors (HTS) for the loss-free transmission of extremely high electric current. Today the company stands for a unique approach in superconductor production.

THEVA has invested over fifteen years in development to build Germany’s first commercial HTS production plant. Thanks to its very high energy density, THEVA Pro-Line superconductor can replace conventional copper wire in high-performance applications. It opens entirely new scope for the design of electrical components. Manufacturers of cables, power switches, large electric drives and power rails can rely on the high quality and performance of the material. THEVA provides high-end solutions in coating technology and equipment engineering.

THEVA Dünnschichttechnik GmbH was founded in 1996 and today has around 50 employees. Headquartered in Germany and with representatives in Asia and the USA, the company has a global presence for its customers. In 2012, with Target Partners and BayBG two powerful VC partners came on board. Since 2016 eCapital and Bayern Kapital have also been supporting the growth of the company. As of the third financing round in 2017 EnBW New Ventures is also among the investors.

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