

Energy Sector

Division Renewable Energy

For the trade press

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Siemens installs two test wind turbines with direct drive technology

Siemens Energy today announced that it will test two 3.6-megawatt (MW) wind turbines with direct drive (DD) technology at a site in west Denmark. The first test turbine will be erected this week, with the second to follow later in 2008. Siemens will subject the two DD wind turbines to comprehensive testing for a minimum of two years. The purpose of this project is to assess whether direct drive technology is competitive with geared machines for large turbines. Beside testing DD technology, Siemens will continue product development of turbines with gearboxes, and new turbines featuring geared technology will be released in the upcoming years. Wind power business is one of the major contributors to the Siemens environmental portfolio. In fiscal 2007, the company generated revenue totaling some EUR17 billion from products and solutions for environmental and climate protection.

The main advantage of direct drive wind turbines is their smart, straightforward design that makes the use of gearboxes dispensable. With fewer moving parts DD technology has the potential to reduce maintenance costs, which could result in higher turbine availability. However, DD machines are typically known to be heavier and more expensive in manufacturing than geared wind turbines. One of the main objectives of the Siemens DD project is to establish if and for which turbine sizes direct drive machines are competitive

with geared turbines. A special focus will be on offshore applications, where wind turbines need to be especially robust and reliable.

Siemens will equip the two DD test wind turbines with synchronous generators excited by permanent magnets. The test generators will be supplied by two different companies: One was developed by the Siemens Industry Sector and the other by Converteam. “By selecting two manufacturers we will be able to compare and access the benefits of different technical solutions with respect to generator design,” said Henrik Stiesdal, CTO of the Siemens Wind Power Business Unit. “At a nominal torque in the range of 2500 kNm the two generators are among the largest permanent magnet machines ever built anywhere in the world.”

Prior to installation of the direct drive test turbines, the two generators will be thoroughly tested on a test bed specially built for this purpose. Inside the test bed the generators can operate up to and above nominal power and speed. The tests on the first generator have confirmed all theoretical assumptions made in the conceptual studies; testing of the second generator has been in progress since June.

With a rotor diameter of 107 meters and a power rating of 3.6 MW, the two test turbines are similar in design to the standard Siemens SWT-3.6-107 offshore machine. By selecting a proven technological basis for the test machines, Siemens will be able to use standard rotor blades, standard towers and many standard components from the 3.6-MW series-produced machine. However, Siemens does not intend to use the configuration of the DD test turbines for future series production.

“Direct drive wind turbines are an exciting technological option, but at this stage we cannot yet state whether they will prove to be a competitive alternative to geared turbines,” said Stiesdal. “But with the installation of two DD test turbines Siemens is laying the foundation for such a judgment and is once more demonstrating its role as the front-runner in the development of innovative technology.” Beside testing direct drive wind turbines, Siemens will continue to develop its proven turbine technology. For example, a new 2.3-MW machine with a 101-meter rotor diameter for sites with low or medium wind speeds is currently at the prototype stage.

The Siemens Energy Sector is the world's leading supplier of a complete spectrum of products, services and solutions for the generation, transmission and distribution of power and for the extraction, conversion and transport of oil and gas. In fiscal 2007 (ended September 30, based on IFRS), the Energy Sector had revenues of approximately EUR20 billion and received new orders totaling around EUR28 billion and posted a profit of EUR1.8 billion. The Energy Sector had a work force of 73,500 at the beginning of fiscal 2008. Further information is available at: www.siemens.com/energy.

All figures represent the sum of the nonconsolidated figures for the Power Generation and Power Transmission and Distribution Groups and for the Oil and Gas activities of the Industrial Solutions and Services Group.