

TECHNICAL INSIGHTS

ENERGY & POWER SYSTEMS



DEVELOPMENT OF 10 MW WIND TURBINES

The technology that enables harvesting energy from wind is one of the most mature among all renewable technologies. However, energy generated by wind turbines is still not cost-competitive with fossil-fuels-based energy without subsidies. Hence, researchers the world over are attempting to build more powerful turbines allowing for better economy and generating more energy while occupying the same land area.

A Norwegian company named Sway Turbine is currently working on the biggest turbine that will have a capacity of 10 MW and will be used for offshore applications. Sway Turbine is developing technology that will be able to take advantage of strong offshore winds. Currently used wind turbine technology is unable to scale up to the levels of 10 MW without a severe weight and cost penalty. Such a turbine requires longer blades and much bigger and heavier generators, which will significantly increase turbine cost, and thus energy generated by it. Sway Turbine is using new generator and rotor designs that allow for maintaining reduced weight and keeping the length of the blades comparable with currently used offshore turbines. Speaking to *Technical Insights*, the company's CEO Ingelise Arntsen, said, "We believe that we will be able to produce [a] 10 MW wind turbine that has similar weight and cost as current 6 MW turbines." Besides new solutions in generator and rotor designs at 10M W, Sway Turbine will not use gearboxes, which will increase turbine reliability.

Larger single wind turbines such as the ones developed by Sway Turbines will help in addressing some of the offshore wind industry challenges. Wind turbines represent around 50% of the total cost that needs to be incurred while developing an offshore wind project. The rest of the costs are connected with towers, foundations, installation, electric cabling and grid connections with underwater cables. Introducing more powerful turbines would reduce the number of turbines in wind farms; and thus the number of towers, the required number of cables for grid connection and so on. In addition, fewer turbines mean less maintenance work for wind farm operators, which are very important, especially for the offshore wind industry. The same technology could be used to manufacture wind turbines up to 15 MW. The technology could also be optimized for onshore applications.

Sway Turbine is working on developing its 10 MW turbine since 2004, and some of its shareholders are Statoil, Statkraft, and Lyse. Currently, the company is in the process of developing a turbine prototype. After this step and the testing period, the commercialization process can begin. It is expected that the 10 MW offshore turbine will be available in the market by 2015.

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