GE has surgical technique to power up wind blades

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Wind turbines continue to draw interest as a promising renewable energy source. Engineers are still addressing challenges, nonetheless, over how to ensure wind power becomes a more viable energy source making economic as well as technical sense. According to the Iowa Energy Center, which is administered through Iowa State University, explorations into designs include augmentors; some experimental

turbines have incorporated this added structural feature intended to increase the amount of wind passing through the blades. Meantime, engineers continue to imagine and work on more efficient designs that put out a greater amount of power at a justifiable cost. Alternative energy sources like wind power provide new options and certain advantages, said the Center, but to be truly competitive with conventional energy sources, they also must be economical.

This month, GE announced impressive headway in coming up with a way to extend wind turbine rotor blades. The technology upgrades GE 1.5-77 turbines to GE 1.5-91 turbines utilizing the entire existing blade asset. According to GE, its goal was to help customers achieve significant increase in power output on their existing fleet while maintaining existing product life and acoustics. Namely, engineers at GE's wind business developed a method to lengthen existing wind blades and increase the rotor diameter by 40 percent. The longer blades allow turbines to harness wind moving at lower speeds and boost power production by more than 20 percent. The company said that two prototypes have been in operation for 10 months, completed with Noble Environmental Power at Noble's Clinton Wind Park in Clinton, New York.

Discussing their work, GE made reference to a paper that was published in 2012 in *Environmental Science and Technology*, "Wind Power Electricity: The Bigger the Turbine, The Greener the Electricity?" by authors from Switzerland and the Netherlands, where, as the title suggested, the scientists concluded that the larger the wind turbine, the greener the electricity it produces.

Mark Johnson, engineering leader at GE renewable energy business, and team found a way to cut a standard 37-meter (121 feet) blade roughly in half and insert a 7-meter (23 feet) blade extension. As a result, the extension allows the turbines to gather power at lower wind speeds while

boosting power output by 20 percent. The model and process utilize the existing design margins of the 1.5-77 turbine in lower wind speed applications, said GE.

The company also said the extended blades have undergone testing beyond International Electrotechnical Commission (IEC) requirements, including static strength and fatigue tests totaling over 6 million cycles.