GE Renewable Energy

Digital Wind Farm

THE NEXT EVOLUTION OF WIND ENERGY

renew.ge/digitalwind

Since entering the wind industry in 2002, GE Renewable Energy has invested more than $2 billion in next-generation wind turbine technology to provide more value to customers—whether at the turbine, plant or grid level. Through the use of advanced analytics, GE Renewable Energy is redefining the future of wind power, delivering with proven performance, availability and reliability. With the integration of big data and the industrial internet, we can help customers manage the variability that comes with this resource for smooth, predictable power. Our onshore product portfolio includes wind turbines with rated capacities from 1.6-3.4 MW and flexible support services that range from basic operations and maintenance to farm- or fleet-level enhancements.

For more information visit our website: www.ge.com/wind

GE's Digital Wind Farm

Offered as a part of GE's expanded services agreements, GE's Digital Wind Farm is a comprehensive hardware and software solution comprised of GE's customizable 2 and 3 MW wind turbine products, and a suite of applications, built on the Predix* software platform, that brings new value to your wind farm. This added wind project value begins with our newest hardware, including an assortment of rotor diameters, tower heights, and turbine ratings. Modular turbine technology enables GE to vary parameters to meet pad-specific conditions and economics.

The software component of the Digital Wind Farm is built on the Predix* platform, which provides a digital infrastructure for your wind farm, enabling you to collect, visualize and analyze unit & site level data. Through the constant collection of real time data—weather, component messages, service reports, performance of similar models in GE's fleets—a predictive model is built and the data collected is turned into actionable insights. These models serve as the basis of our suite of applications, which allow operators to optimize maintenance strategy, improve reliability and availability and increase energy production.

Creating Your Digital Wind Farm

Optimizing hardware to get the most from your wind resource...

GE's Digital Wind Farm starts with a virtual plan. We assess the wind resource of your site, at the farm and unit level, to create a simulated model of the farm. Using our newest turbine technology, the 2 MW and 3 MW platforms, the virtual model allows us to define the best turbine configuration and site layout. A unique turbine configuration is identified for every pad, based on the wind conditions and economics it sees. This is accomplished by varying three parameters: tower height, rotor diameter and nameplate. The result is a customized solution, which increases the annual energy production (AEP) at your site, generating more power and more revenue.
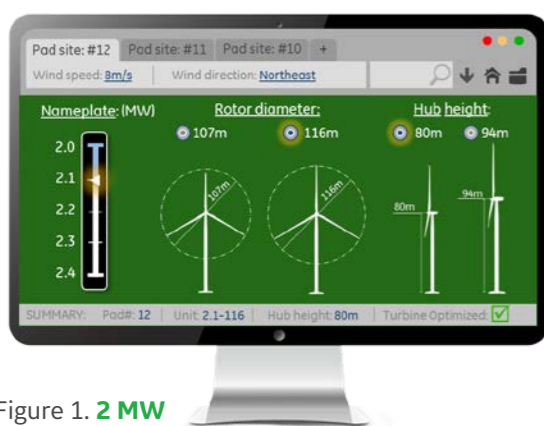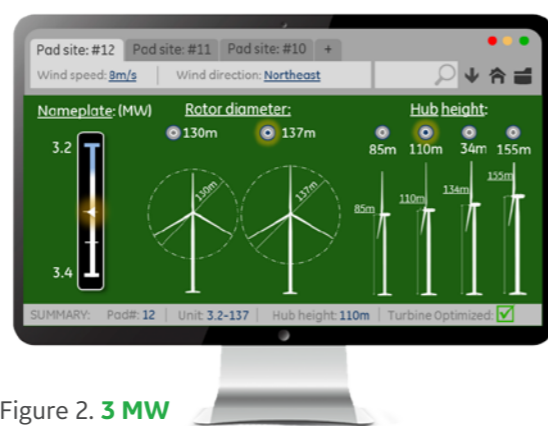

Figure 1. **2 MW**

Figure 2. **3 MW**

The Digital Wind Farm in Action

A whole new approach to getting the most out of your site

Applying virtual design modeling from the Digital Wind Farm, GE was able to increase the annual energy production (AEP) of a customer project in the eastern United States by 16%, generating more power and more revenue.

Siting all GE 2.0-116s with 80m tower left output and money on the table ...

Applying the Digital Wind Farm maximized value of the wind resource ...
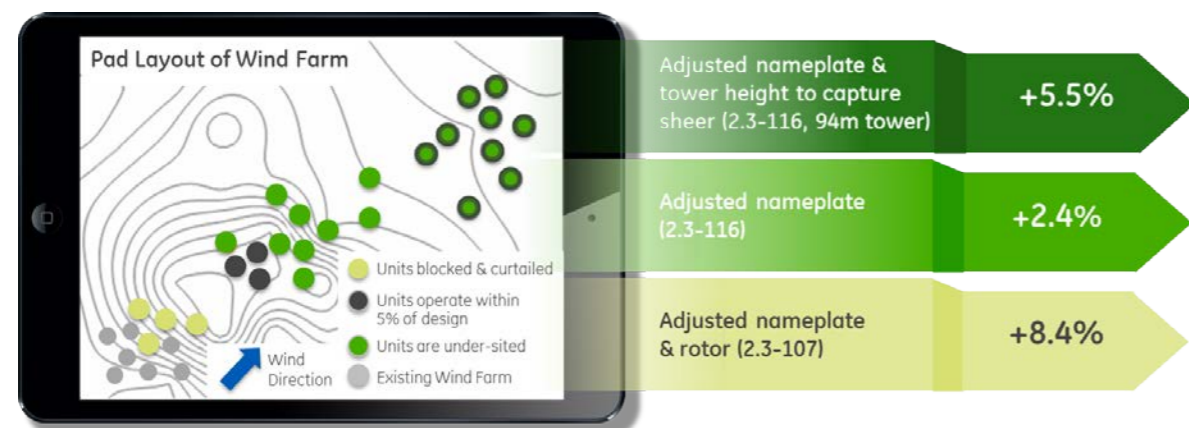
Enhancing and Optimizing Your Wind Farm

Utilizing software to get the most from your hardware...

With the power of the industrial internet and Predix, GE can support you over the lifecycle of your wind farm. The Digital Wind Farm works to optimize the power output of the farm throughout its lifespan. GE captures diverse streams of high velocity data in a comprehensive library, creating a digital model of your physical assets. We call this model a 'Digital Twin.' Customer tools and applications then leverage the Digital Twin to empower customers with actionable insights. The power of the Digital Wind Farm lies in our ability to turn real-time operational data into better, faster decision making. These decisions can be made on a unit-by-unit basis, across the farm and even across the enterprise.

We can detect patterns and anomalies in turbine performance, unit-by-unit, to help you make proactive service decisions and keep your fleet running smoothly. Across your farm, we use advanced analytics to develop site-level action plans to help you prioritize the maintenance needs of your fleet. Our digital feedback loop allows you to save on both planned and unplanned maintenance costs while capturing higher power output from machines that are operating more efficiently and reliably. All of these software applications enable each turbine, farm and fleet to operate more efficiently over the entire duration of the project timeline without compromising turbine hardware or design life.

GE's New Suite of Digital Wind Farm Apps

Our new software applications enhance annual energy production and improve wind farm profitability.

What is the Predix Platform?

Predix is a cloud-based software platform powering innovative industrial internet applications that turn real-time data into insights for better, faster decision making. The power of Predix allows you to collect and analyze data at the unit, farm and fleet level to optimize your fleet's performance.

MAKING RENEWABLES
THE ENERGY OF CHOICE
FOR A CLEANER FUTURE

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TORQUE

DIGITAL WIND FARM

WindSCADA™

INDUSTRIAL INTERNET

CONNECTED MACHINES

YAW