

GE Power & Water
Renewable Energy



GE's 1.6-82.5

Capacity factor leadership
in Class II winds

a product of
ecomagination



imagination at work

GE's 1.6-82.5 Wind Turbine

Product evolution. It's one of the things GE does best. Especially when it comes to the next generation of wind turbines. Building on a strong power generation heritage spanning more than a century, our onshore wind turbines deliver proven performance, availability and reliability—creating more value for our customers.

As one of the world's leading wind turbine suppliers, GE Energy's current product portfolio includes wind turbines with rated capacities ranging from 1.5 MW–4.1 MW and support services extending from development assistance to operation and maintenance.

GE's 1.6-82.5 Wind Turbine

GE's 1.6-82.5 wind turbine is now the turbine of choice for IEC class II winds, offering a 15% increase in swept area and an extra 100 kW output compared to the 1.5-77 turbine—resulting in 15% increase in Annual Energy Production AEP at 8.5 m/s. This increase in blade-swept area allows greater energy capture and extra output at rated speed and drives improved project economics for wind developers. GE's proprietary Advanced Loads Control allow siting of the 82.5 meter rotor in Class II wind regimes, combining drive train sensors and capabilities of the Mark* VIe turbine controller to individually pitch blades and improve loads handling performance.

GE's stringent design procedures result in a turbine designed for high performance and availability with the same reliable performance as the 1.5 MW series turbine.

Available in 65 meter, 80 meter and 100 meter tower heights, these sizes provide flexible options for Class II wind sites, allowing for higher energy capture in higher wind speed environments.

Building Upon the Proven 1.5 MW Platform

The evolution of GE's 1.5 MW turbine design began with the 1.5i turbine introduced in 1996. The 65 meter rotor diameter turbine soon was increased to 70.5 meters in the 1.5s then to 77 meters in the 1.5sle turbine which was introduced in 2004. Building on the exceptional performance and reliability of the 1.5sle, GE introduced the 1.5xle with its 82.5 meter diameter in 2005. Subsequent improvements in design led to the introduction of the 1.6-82.5 turbine in 2008. Built from the maturity of its predecessors, this evolution ensures increased capacity factor while increasing AEP and application space.

Designed with high reliability to ensure continued operation in the field, GE's 1.6-82.5 wind turbine builds on the exceptional availability of its predecessors.

Technical Description

GE's 1.6-82.5 wind turbine is a three-blade, upwind, horizontal axis wind turbine with a rotor diameter of 82.5 meters. The turbine rotor and nacelle are mounted on top of a tubular steel tower, providing hub heights of 65 meters, 80 meters and 100 meters. The turbine uses active yaw control to keep the blades pointed into the wind. The 1.6-82.5 wind turbine is designed to operate at a variable speed and uses a doubly fed asynchronous generator with a partial power converter system.

Specifications:

- Designed and certified to IEC 61400-1
 - TC II: 8.5 m/s average wind speed; B turbulence intensity
- Standard and cold weather extreme options
- Standard tower corrosion protection; C2 internal and C3 external with optional C4 internal and C5 external available
- Rotational direction: Clockwise viewed from an upwind location
- Speed regulation: Electric drive pitch control with battery backup
- Aerodynamic brake: Full feathering of blade pitch

Features and Benefits

- Higher AEP than its 1.5 predecessors
- Capacity factor leadership in Class II winds
- Designed to meet or exceed the 1.5 MW platform's historic high availability
- Grid friendly options are available
 - Enhanced Reactive Power, Voltage Ride Thru, Power Factor Control
- Wind Farm Control System; WindSCADA*
- Sharing of components with family products
- Available in both 50 Hz and 60 Hz versions for global suitability

Capacity factor leadership in Class II winds



Construction

Towers: tubular steel sections provide hub heights of 65 meters or 100 meters

Blades: Proven GE 40.3 m blades

Drivetrain components: GE's 1.6-82.5 uses proven design gearboxes, mainshaft, and generators with appropriate improvements to enable the larger rotor diameter in Class II winds

Enhanced Controls Technology

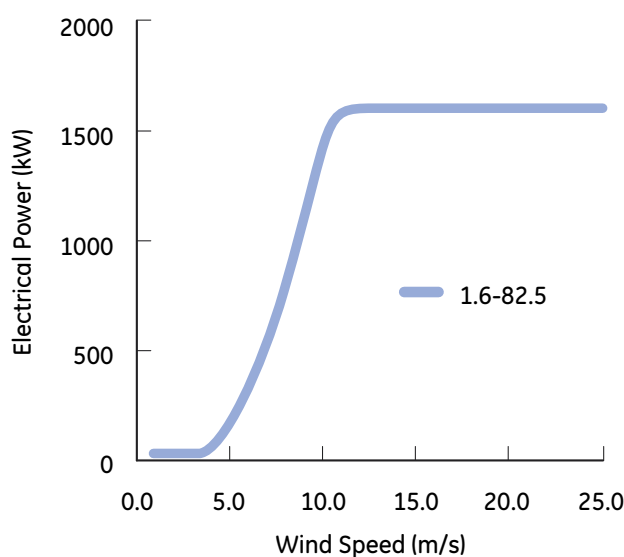
The 1.6-82.5 wind turbine employs GE's patented Advanced Loads Control. This feature reduces loads on turbine components by measuring stresses and individually adjusting blade pitch.

Condition Monitoring System

GE's Condition Monitoring System (CMS) and SCADA Anomaly Detection Services, a complementary suite of advanced condition monitoring solutions, proactively detect impending drive train and whole-turbine issues enabling increased availability and decreased maintenance expenses. Built upon half a century of power generation drivetrain and data anomaly monitoring experience, this service solution is available as an option on new GE Units and as an upgrade.



Power Curve



Capacity factor leadership in Class II winds



Powering the world...responsibly.

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