

GE Power & Water
Renewable Energy

GE's 1.5-77 (Class I)

Focusing on performance,
reliability and efficiency

ecomagination



imagination at work

GE's 1.5-77 Class I 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'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 1.5-77 (Class I) Wind Turbine

Building on the exceptional turbine performance and reliability of our 1.5 MW series platform, GE advanced its original Class I wind turbine, the 1.5-70.5, with increased rotor length and controls technology allowing greater energy capture and improve project economics for wind developers. GE's 1.5-77 turbine has a 19% increase in swept area relative to the 1.5-70.5 resulting in greater Annual Energy Production (AEP). GE's 1.5-77 Class I wind turbine has a 57.9% gross capacity factor at 10 m/s – a class leading performance.

GE's new 1.5-77 (Class I) with Advanced Loads Control shares components with the 1.5-77 (Class II) and 1.6-82.5 creating one common 1.5 MW wind turbine series platform. This ensures consistent workhorse reliability, ease of maintenance planning and high commonality in spare parts.

Available in 65 and 80 meter heights, the towers are reinforced for use in seismic areas. The 1.5-77 turbine is designed for the most robust wind resource environments on the planet.

Building Upon the Proven 1.5 MW Platform

Focusing on performance, reliability, efficiency, and multi-generational product evolution, GE's Class I 1.5-77 wind turbine continues to deliver wind product leadership. GE's proprietary Advanced Loads Control system is designed to enable the 1.5-77 meter rotor wind turbine to meet design loads and related certification requirements for IEC Class I.

Technical Description

GE's 1.5-77 wind turbine is a three-blade, upwind, horizontal axis wind turbine with a rotor diameter of 77 meters. The turbine rotor and nacelle are mounted on top of a tubular steel tower providing hub heights of 65 and 80 meters. The machine uses active yaw control to keep the blades pointed into the wind. The turbine is designed to operate at a variable speed and uses a doubly fed asynchronous generator with a partial power converter system.

Specifications

- Designed to IEC 61400-1
 - TC Ib: 10 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 1.5-70.5 (Class I) predecessor
- 57.9% gross capacity factor at 10 m/s – a class leading performance
- 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
- GE's proprietary 37.0 meter blade
- Available in both 50 Hz and 60 Hz versions for global suitability

Focusing on performance, reliability and efficiency



Construction

Towers: tubular steel sections provide hub heights of 65 meters or 80 meters

Blades: GE's 37.0 meter blades

Drivetrain components: GE's 1.5-77 uses proven design gearboxes, main shaft and generators from the 1.6-82.5

Enhanced Controls Technology

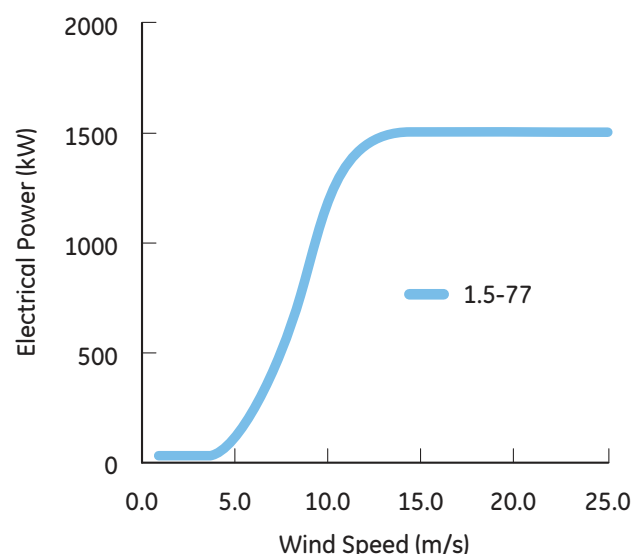
The 1.5-77 wind turbine employs GE's patented Advanced Loads Control. This feature reduces loads on turbine components by measuring stresses and individually adjusting blade pitch.

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



Focusing on performance, reliability and efficiency



Powering the world...responsibly.

For more information please visit www.ge-energy.com/wind.



* Denotes trademarks of General Electric Company

© 2013 General Electric Company. All rights reserved.

GEA18768D (06/2013)