



SIEMENS

# Exceptional performance, proven reliability

Siemens Onshore Geared platform –  
geared wind turbines with a power rating  
of up to 2.5 MW

[siemens.com/wind](https://www.siemens.com/wind)



SWT-2.3-101



SWT-2.3-108



SWT-2.5-120

## Your trusted partner

There is a reason why customers continue to rely on Siemens. Because for 30 years, the world has experienced the innovation and risk mitigation that has established Siemens as one of the leading global suppliers of onshore wind power solutions. Since 1980, developing and implementing innovative solutions to improve every customer's business case has been our main driver.

With the increasing demand for the renewable energy that onshore wind provides – and consequently the greater number of turbines installed at inland and coastal sites – innovative solutions are needed to provide turbine reliability under challenging conditions.

It is for this kind of reliability and ability to optimize return on investment throughout the a project's lifecycle that customers have come to rely on Siemens' millions of hours of experience. By drawing on this substantial knowledge, Siemens continues to improve its established range of flexible service solutions in order to increase the output of its turbines and exceed its customers' needs.

The combination of robust and reliable turbines, highly efficient solutions for power transmission and distribution, and a deep understanding of the entire energy market ensures that Siemens continues to take the wind power industry to new levels.

*As their trusted partner, customers have relied on Siemens to improve their business case and drive innovation in the industry for more than 30 years.*

## Intelligently driving down the cost of electricity

Wind power has fast become directly competitive with traditional energy sources. Driving down the levelized cost of wind energy is a key target for Siemens, as we strive to make wind power independent of subsidies through innovation and industrialization.

Out platform strategy is based on our extensive experience and knowledge. Standardization and modularization are fundamental to the platform approach, allowing us to develop a lean design process and streamline manufacturing and installation.

Each of our products is a member of one of four platforms: the Siemens Onshore Geared platform, Siemens Onshore Direct Drive platform, Siemens Offshore Geared platform, and Siemens Offshore Direct Drive platform.

The Onshore Geared platform comprises onshore geared wind turbines with a power rating of up to 2.5 MW.

### Setting the standard for onshore availability

The Siemens Onshore Geared platform represents the culmination of an evolutionary process of innovation and refinement of our wind turbines that dates back to 1980.

The Siemens Onshore platform turbines are proven products tailored to local conditions that offer a safe investment with excellent returns for years to come.

Major components like the rotor hub, main shaft, gearbox, and yaw system are of especially sturdy dimensions, and all details are designed using the highest engineering standards.

The structural design combined with a high-performance drive train, robust canopy design for maximum protection of internals, and a generator with no slip rings contributes to exceptional reliability.

Innovative design and intelligent maintenance also allow for reduced unscheduled service, which leads to high yield with low operational costs and an optimized return on investment.

For superior availability, reliability, and a lower levelized cost of energy, the Siemens Onshore Geared platform is the ideal solution.

## Expertise in practice: fully developed technology, advanced design

### A proven and reliable product platform

Siemens wind turbines are built to last. The robust design of Siemens Onshore Geared wind turbines delivers a reliable output throughout the entire turbine lifecycle. The unique blades are not glued together from a number of spars and shells – instead, we utilize our IntegralBlade® and aeroelastically tailored blade technologies to make intelligent use of the flexing capabilities of the blade structure.

This allows for the SWT-2.5-120's larger rotor size and increased blade diameter without a proportional increase in structural loads. The nacelle is ergonomically optimized for maintenance thanks to the increased accessibility of components and is enclosed by a steel canopy designed for maximum protection of internals. The Siemens Onshore Geared wind turbines set the industry standard for availability.



## Superior performance and higher yields

### Optimal energy output in moderate wind conditions

To develop the Onshore Geared platform, we drew on decades of practical experience in the onshore wind industry. The SWT-2.5-120 is the culmination of this knowledge, based on reliable results ensured through detailed component and system testing and validation, as well as certification. By integrating field data into its design, the SWT-2.5-120 provides a high capacity factor wind turbine that spans medium and low wind regions.

### Tailoring service to your specific needs

To sustain your investment, our service team will fashion an intelligent service solution designed to deliver reliability and maximum output. The ultimate goal: optimizing your return on investment throughout the lifetime of your project. Servicing your wind power plants requires dedication and a long-term partnership with a commitment to care. By tailoring our flexible range of solutions to your specific needs, we deliver 360° asset care for the lifetime of each turbine. When an action is needed, we call on our unique diagnostic capabilities and experience to provide smarter and faster responses.

# Proven technology, advanced performance.

### Siemens NetConverter®

The NetConverter® system offers maximum flexibility in the turbine's response to voltage and frequency control, fault ride-through, and output adjustment. As a result, Siemens wind turbines can be configured to comply with a variety of relevant grid codes in major markets and be readily connected to the grid.

### Siemens IntegralBlade® and Aeroelastically Tailored Blade technologies

The Siemens Onshore Geared platform wind turbine rotors benefit from blades manufactured using patented IntegralBlade® technology. The blades are made in one piece from fiberglass-reinforced epoxy resin in a single production step. As a result, all glue joints – the potential weak points that could expose the structure to cracking, water ingress, ice formation, and lightning damage – are eliminated.

The third generation of Siemens blades incorporates innovative aeroelastic properties, including blade twisting and blade bending. Thanks to the aeroelastically tailored blade (ATB) technology, the blades can be longer without transferring added loads from the rotor to the turbine structures. The ATB technology enables the blade to harvest more energy from the wind, which increases the annual energy production.

### Siemens WebWPS SCADA system

Via a standard Web browser, the Siemens WebWPS SCADA system provides a variety of status views of electrical, mechanical, meteorological, and grid station data as well as operation and fault status.

### High Wind Ride Through functionality

Wind turbines are normally programmed to shut down if the 10-minute mean wind speed exceeds 25 m/s. This may lead to significant challenges for the grid system if the turbines in large wind farms are shut down more or less simultaneously.

The Siemens Onshore Geared platform supports grid stability with the High Wind Ride Through system. It replaces the fixed high wind shutdown threshold with an

intelligent load-based reduction in output power at certain storm-level wind speeds.

### Power boost functionality

The Siemens Wind Power power boost functionality is a wind turbine control feature that increases the annual energy production of the turbine by raising the rating up to 5% depending on site conditions. The feature is implemented, operated, and controlled on each wind turbine.

### Vibration diagnostics service

Our vibration diagnostics service enables us to detect anomalies early on and prevent potential failures. This requires our diagnostics experts to analyze vibration patterns and compare them with values from the Siemens database. This database is founded on archived records from almost 10,000 Siemens wind turbines. Thanks to these analyses combined with predictive methods, we can optimize service planning and repair components proactively before serious damage can occur. Since July 2008, we have been able to detect 97% of all potential gear-tooth cracks and prevent them from becoming fatal.

### Service

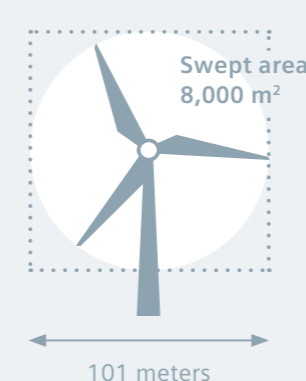
With an increasing number of turbines being installed around the globe, consistency is essential for generating an optimal return on investment throughout a project's lifetime. Whether you operate wind turbines at inland, coastal, or offshore sites, our service team will craft an intelligent Siemens service solution that is custom-made for your needs. They will collaborate with you to deliver reliability and maximum output under all conditions.

### Ongoing improvements in safety

Safety is at the heart of all Siemens operations. From production to installation, operation, and service, Siemens strives to set the standard for a zero-harm culture.

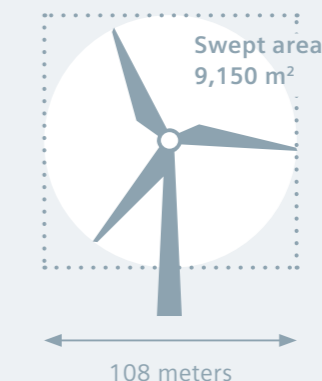
### Optimized energy output in moderate wind conditions

The 101-meter rotor is specifically designed to optimize the energy output in areas with moderate wind conditions. The B49 blade's pitch regulation optimizes and increases control over energy output. Aerodynamic properties also allow for quieter operation, resulting in fewer disturbances to both people and wildlife.



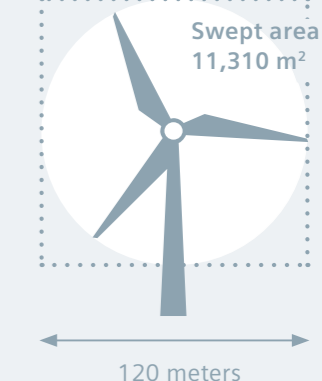
### Extra energy output in low to moderate wind conditions

The SWT-2.3-108 offers a superior combination of a large rotor and robust design. The B53 uses Siemens' innovative aeroelastic blade design, which allows a larger rotor diameter and higher energy output without increasing structural loads. As a result, the SWT-2.3-108 turbine delivers a lower cost of energy in low to moderate wind conditions.



### High capacity factor for higher returns

Designed with the demands of the market in mind, the SWT-2.5-120 incorporates a variety of innovative features that have been scaled and streamlined to deliver a capacity factor for sites with medium to low wind conditions. The 120-meter rotor diameter with a 23% increase in swept area allows for this high capacity factor and enhanced energy production.



	SWT-2.3-101	SWT-2.3-108	SWT-2.5-120
IEC Class	IIA	IIB	IIS
Nominal power	2,300 kW	2,300 kW	2,500 kW
Rotor diameter	101 m	108 m	120 m
Blade length	49 m	53 m	59 m
Swept area	8,000 m <sup>2</sup>	9,150 m <sup>2</sup>	11,310 m <sup>2</sup>
Hub height	80 m or site specific*	78.5 – 115 m*	85.1 m
Power regulation	Pitch regulated, variable speed	Pitch regulated, variable speed	Pitch regulated, variable speed
Annual output at 8.5 m/s	9.6 GWh	11.1 GWh	12.6 GWh

\* According to defined tower program

With thousands of units installed, the Siemens Onshore Geared wind turbines are unrivaled in their class when it comes to proven performance, productivity, and availability.

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Beim Strohhaus 17-31  
20097 Hamburg, Germany  
[siemens.com/wind](http://siemens.com/wind)

For more information, please contact  
our Customer Support Center.  
Phone: +49 180 524 70 00  
Fax: +49 180 524 24 71  
(Charges depending on provider)  
Email: [support.energy@siemens.com](mailto:support.energy@siemens.com)

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