

The Siemens logo is displayed in a bold, teal, sans-serif font. It is positioned in the upper right corner of the advertisement, within a white rectangular box. The background of the entire advertisement is a photograph of an offshore wind farm, with several large white wind turbines standing in a deep blue sea under a clear sky. The turbine in the foreground is the most prominent, showing its three blades and the tower structure. Other turbines are visible in the distance, creating a sense of scale and depth. The overall tone is professional and emphasizes the company's role in renewable energy technology.

SIEMENS

Ingenuity for life

The standard for offshore wind

The Siemens Offshore Direct Drive platform –
incorporating three decades of engineering.

siemens.com/wind

Siemens, the offshore leader

Siemens has been a major driver of innovation in the wind power industry since 1980, when wind turbine technology was still in its infancy.

Technology has changed with the times, but Siemens' commitment to providing its customers with proven wind turbine solutions remains the same.

In recent times, the world has seen an intense increase in the nature and capacity of offshore wind power plants. Given the logistical challenges of offshore projects, where even the smallest issue can amplify costs, having technology that works and continues to work is paramount. This is exactly the right task for Siemens.

Drawing on more than 30 years of experience in the wind power industry, a strong focus on renewables, and a global network of highly skilled and trained employees, Siemens has proven itself a trustworthy and reliable business partner and will continue to be so in the future.

In 1991 we installed the world's first offshore wind power plant at Vindeby in Denmark. From these modest beginnings to today, Siemens benefits from a track record that makes it the world leader in offshore turbines. As the preferred solution for some of the world's largest offshore wind power plants – London Array, Gemini, and East Anglia ONE – Siemens technology is paving the way for green energy from the sea to become a cornerstone of the global energy mix.

Over the years, Siemens has also accumulated a vast amount of service experience offshore. Drawing on this substantial knowledge, the company has established a flexible range of service solutions that are designed to optimize the output of offshore wind turbines.



The first SWT-6.0-154 prototype

Intelligent ways to drive down the cost of electricity

Wind power is coming of age. It is fast becoming 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.

Standardization and modularization are fundamental to the platform approach, allowing us to streamline manufacturing and installation and develop a lean design process.

Altogether, Siemens has installed more than 1,500 direct drive wind turbines. As such the newly introduced SWT-8.0-154 will be the first industrialized machine in the offshore history.

Each of our products is now a member of one of four platforms: the Onshore Geared, Onshore Direct Drive, Offshore Geared and Offshore Direct Drive platform. The Siemens Offshore Direct Drive platform comprises wind turbines with power ratings of 6 MW, 7 MW, and 8 MW.

Reduced complexity, outstanding performance

The Siemens Offshore Direct Drive platform is the culmination of Siemens' three decades of experience and expertise.

Each turbine of the Offshore Direct Drive platform embodies tried and tested innovation; the state-of-the-art direct drive technology has been deployed in the field for years.

Whether the 8.0-MW wind turbine or its predecessors the 7.0-MW or 6.0-MW, these turbines redefine the wind industry's standards for leanness, robustness, and life-cycle profitability.

In harsh offshore conditions, moving parts are likely to wear. But through the application of the direct drive technology, Siemens Offshore Direct Drive wind turbines use fewer moving parts than comparable geared machines. Besides reducing the likelihood of failures, this also means fewer spare parts are needed over the course of a wind farm's lifetime.

This unique combination of simplicity, robustness, and low weight significantly reduces infrastructure, installation, and service costs – while increasing a project's lifetime energy output. Lower tonnage quite simply translates to greater power production at lowest lifecycle cost.

The Siemens Offshore Direct Drive platform stands on the shoulders of Siemens offshore experience. A key element in any offshore project is managing weather risk. Therefore reducing installation time is a critical factor. This lesson has led to the decision to place the transformer of the Offshore Direct Drive platform in the nacelle.

This placement means fewer power losses, fewer cables, and faster installation and commissioning, which enables earlier production and less downtime throughout a project's lifetime.

The unique design of the 154-meter rotor of the platform has a swept rotor area of 18,600 m². It therefore maximizes energy yield at offshore locations, from inland waters with moderate wind resources to even the most exposed offshore sites.

Wherever superior performance is key – the wind turbines of Siemens' Offshore Direct Drive platform are the go-to solution.

Lean, robust, and reliable technology

Lean

Siemens Offshore Direct Drive wind turbines are based on proven Siemens direct drive technology: the simplest and most straightforward wind turbine design in the industry. Replacing the gearbox, the coupling, and the high-speed generator with a low-speed generator eliminates the high-speed stages of conventional drivetrains.

Until now, the weight of large wind turbines has grown disproportionately to increases in power rating. The Siemens Offshore Direct Drive platform has conclusively broken this technology trend.

The simplified drivetrain allows for a low tower head mass, keeping Siemens Offshore Direct Drive wind turbines genuinely lean. This low-weight standard for offshore wind turbines offers significant cost benefits in terms of substructure requirements, shipping, and installation.

Robust

Benefiting from our unique offshore experience, the Offshore Direct Drive platform is designed to exploit the broadest range of offshore environmental conditions. Designed to IA and IB standards, these wind turbines can be deployed in all known offshore locations.

The structural capacity of all components has been verified by full-scale testing. Highly accelerated lifetime tests on all main components and the entire nacelle demonstrate their robustness. The entire turbine design is tailored to offshore applications: all external surfaces and systems feature offshore-grade corrosion protection, and the completely enclosed nacelle is equipped with internal climate control.



Reliable

The Siemens Offshore Direct Drive platform represents all the knowledge of the world's most experienced offshore wind turbine manufacturer – which makes it the reliable choice. In the proven SWT-6.0-154 – with 150 units installed worldwide – and its upgrades, the SWT-7.0-154 and the SWT-8.0-154, all the classic virtues of Siemens turbines have been included – ample dimensioning of main components, redundant safety systems, and designed with the best engineering practices. Through this we improve project profitability along with providing the lowest possible project risk.

This facilitates bankability and gives our customers a viable business model.

Simple and robust, the direct drive technology lays the best possible foundation for our turbines. The rotor blades combine lightness and strength as a result of the unique single-cast Siemens IntegralBlade® production. The nacelle, which houses the power system, forms a self-contained unit and delivers medium-voltage power to the wind farm grid.

Finally, the maintenance process has been reinvented too. Complete with a crane and workbench inside the nacelle, the turbine contains its own on-site workshop.

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 can be readily connected to the grid.

Siemens IntegralBlade® technology

The 154-meter rotor uses blades manufactured with Siemens' unique, 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.

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 Offshore Direct Drive 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 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. Using 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 destructive.

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 far-from-shore 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

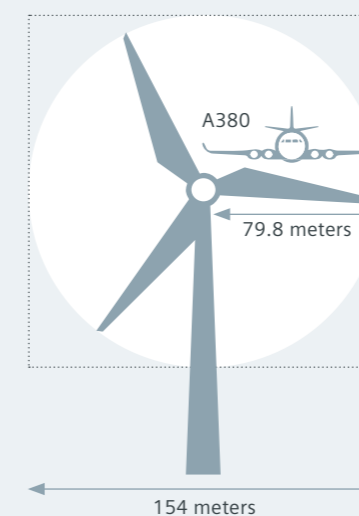
Safety is at the heart of all Siemens operations. From production to installation, operation, and service, Siemens strives to set the standard for a zero-harm culture. Onshore precommissioning and testing significantly reduce the amount of work that needs to be performed in riskier offshore conditions. While the simplified direct drive concept in itself reduces service requirements, offshore maintenance has been completely rethought. Service technicians can enter the turbine via the heli-hoist platform or a conventional tower access, where a new gangway system enables safer access in rough sea conditions. The spacious nacelle, which houses far fewer parts than usual, provides technicians with optimized access to all key components.

For maximum output

The 154-meter rotor, designed especially for the wind turbines of the Siemens Offshore Direct Drive platform, uses the B75 blade. This is the world's longest glass fiber structure in serial production, with a swept rotor area of 18,600 m². It therefore maximizes energy yield at offshore locations, from inland waters with moderate wind resources, to the most exposed offshore sites.

Meeting every need

With 6, 7, and 8 MW classes all available, the Siemens Offshore Direct Drive platform offers customers the ideal product whatever their turbine needs. Through the customer benefits that the product platform delivers – business case certainty and investment security – wind is transformed into a valuable asset.



	SWT-6.0-154	SWT-7.0-154	SWT-8.0-154
IEC Class	IA	IB	IB
Nominal power	6,000 kW	7,000 kW	8,000 kW
Rotor diameter	154 m		
Blade length	75 m		
Swept area	18,600 m²		
Hub height	Site specific		
Power regulation	Pitch regulated, variable speed		

With its robust, proven design and optimized output abilities across all IEC classes, the Siemens Offshore Direct Drive platform is the perfect choice for a reliable and profitable investment that helps drive down the cost of offshore wind energy.

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