

# MANUFACTURING

Production • Fabrication • Components • Supply Chain • Materials • Tooling • Machinery

## Moventas to Increase Its Gearbox Capacity

Moventas is expanding its wind-gearbox assembly and testing capacity at its manufacturing locations in Jyväskylä, Finland. The investment includes expansion of component manufacturing, serial production facilities, and new 6-MW testing facilities. The investment expands existing gear-manufacturing capacity to more than 5 GW, with the ability to expand further as volumes grow.

The expansion-related construction works will be finalized by the end of 2017, and the additional capacity will be operational by the first quarter of 2018. The overall investment is 17 million euros and will be done in co-operation with municipally owned real estate company, Jykes Kiinteistöt Oy.

The investment will enable Moventas to meet the growing demand for its Exceed series gearbox. Moventas designed Exceed with 20 percent more torque density, 10 percent less size and with 100 percent proven Moventas technology in response to the market challenge to lower the life cycle cost of wind power. The best-in-class performance from Exceed has been proven in the field with more than 1 GW of Exceed gearboxes delivered to three customers in five continents over the past year.

“We designed Exceed to fulfill the market need for bigger gearboxes that could improve the life cycle cost of wind power,” said Moventas CEO Arto Lahtela. “This significant new investment in capacity will enable us to meet the growing demand from our customers for Exceed gears. By investing further in Finland alongside our other manufacturing facilities, we can shorten our production



Exceed series gearbox assembly at Moventas' Ikola factory. (Courtesy: Moventas)

lead-times, improve our efficiency, and ensure continued high quality standards.”

This investment in overall capacity on assembly and testing also will serve Moventas' multi-brand service business, which sees growing demand for service and repair from bigger gears as Europe's fleet of wind turbines matures. Moventas has a global network of high quality wind-gearbox service centers, but the

gearbox manufacturing expertise is centralized in Finland.

With the investment, Moventas enforces its commitment to the region, its local workforce, and the efficient international supplier network that has been built around the facility in the past years. ↴

Source: Moventas

For more information, go to [www.moventas.com](http://www.moventas.com)

## World's Most Powerful Turbine Smashes 24-Hour Power Generation Record

MHI Vestas Offshore Wind recently unveiled its uprated 8 MW wind turbine, enabling its 8 MW platform to reach 9 MW at specific site conditions. The company's prototype at Østerild broke the energy generation record for a commercially available offshore wind turbine in December, producing 216,000 kWh over a 24-hour period.

The new V164 can reach a rated power of 9 MW depending on specific site conditions. The increased energy production per wind turbine will add greater value for many projects and save on Capital Expenditure (CAPEX) costs as fewer machines will be needed to meet the park capacity.

"We are committed to delivering turbine technology that is in line with the development of our industry, based on our 20-plus years of offshore experience," said Torben Hvid Larsen, CTO. "Reliability remains a key enabler, and our approach to developing our existing platform supports this strategy. ... We are confident that the 9 MW machine has now proven that it is ready for the market, and we believe that our wind turbine will play an integral part in enabling




MHI Vestas Offshore Wind's uprated 8-MW wind turbine. (Courtesy: MHI Vestas)

the offshore industry to continue to drive down the cost of energy."

The 9 MW wind turbine is part of the product portfolio designed to deliver affordable offshore wind power. The turbine is based on the V164-8.0 MW, a machine already installed at the 258 MW Burbo Bank Extension, and which has a firm order book of more than 1.6 GW.

Installation of the first project with

the most powerful serially produced turbine was successfully completed a few months ago, using the V164-8.0 MW. MHI Vestas has further developed this platform in a continued commitment to deliver affordable offshore wind power. 

Source: MHI Vestas Offshore Wind  
For more information, go to [www.mhivestasoffshore.com](http://www.mhivestasoffshore.com)

## 66.9-Meter Blades Delivered for Goldwind's 3 MW Turbine

LM Wind Power recently announced its newly developed 66.9-meter blades for Goldwind's 3 MW wind-turbine platform, the GW3S, were installed successfully on the first prototype turbine.

The new blade was developed in record time with the installation taking place less than six months from project initiation.

The LM Wind Power blades have been selected as part of Goldwind's strategy to provide advanced technology and high performing products that can serve the significant domestic market in China and support Goldwind's ambitious globalization strategy. The blades will be produced at LM Wind Power's plant in Qin Huang Dao in the North eastern part of China.

"With this turbine, Goldwind aspires to lead the industry in availability and performance in the low-wind speed segment where rotor diameters are increasing in size," said Goldwind executive VP Wu Kai. "Goldwind recognizes tailor-made blades as the best way to improve the competitiveness of the wind turbine, and LM Wind Power as a long standing, reliable partner, was an obvious choice. We are very pleased with the collaboration and fast execution of this new blade project."

"We see the collaboration on the blades for the GW3S platform to be a milestone in our partnership with Goldwind," said LM Wind Power's CEO, Marc de Jong. "Our teams have worked closely together to develop the 136-meter rotor, and we are working on



The first set of LM Wind Power's 66.9-meter blades was installed on Goldwind's 3-MW turbine in January. (Courtesy: Goldwind)

even more blade designs for this and larger turbine platforms. We look forward to supporting Goldwind in their growth plans and the continued innovation on new blade designs.”

Source: LM Wind Power

For more information, go to [www.lmwindpower.com](http://www.lmwindpower.com)

## Test Systems Bring the Next Generation of Technology to Life

Testing is crucial to innovation. While many new ideas are born every single day, not all can successfully make their way into the field. Key to understanding which ideas are economically viable is R&D test systems, and never has this been more crucial than in the manufacturing industry. Through using the test system, manufacturers can tailor products to specific performance requirements before installation and commissioning, helping to enhance performance in the field. They can also help to prove R&D and deliver life-cycle results, which are invaluable for developing new innovations.

Without test systems, manufacturers cannot ensure the quality and lifespan of products, nor can they understand the limitations of the components. When you consider, on average, that a wind turbine can cost more than 5 percent of the initial investment (excluding the cost caused by loss of production) or that a single equipment failure may shut down an entire power plant and cause a city-wide black out, safeguarding such investments is crucial.

By testing products at the research and development phase, as well as re-testing before product delivery — so called end-of-line testing — operators can significantly reduce the probability of running into problems out in the field. This practice helps accelerate the development cycle, improve productivity and cost efficiencies and plays a crucial role in bringing the next generation of technology to life.

Much like the power-generation industry, test requirements are changing as technology evolves. In the past, test systems were mechanical, but today, an electrical approach is favored within the industry because it results in higher performance and quality of testing due to the wider scope of testing scenarios



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it allows. With this in mind, manufacturers should seek out the companies with vast electrical and mechanical expertise that can act as trusted partners in testing products and innovations.

## LONG-TERM SUCCESS

It does take time to accumulate knowledge, experience, and insight into how to set up the most efficient and lasting test systems.

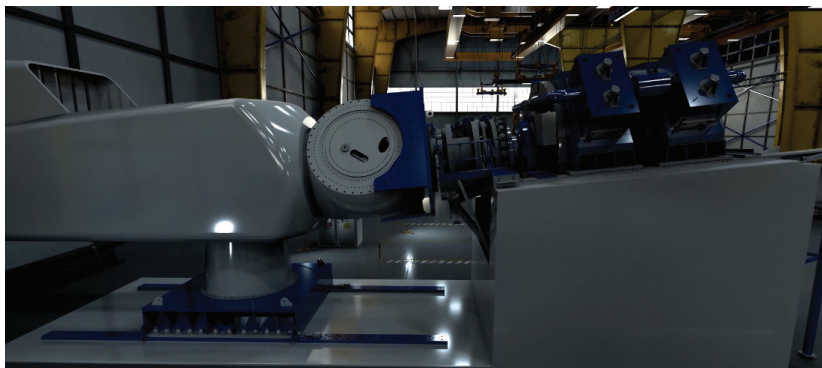
Having been in the test industry for more than 30 years, GE provides turnkey projects and takes care of the full lifecycle of the benches. Today it has more than 2,500 test benches installed globally across various industries such as marine, renewables, automotive, power generation, and oil and gas.

At the heart of its practice is leveraging GE's Power Conversion's extensive electric engineering experience to provide a qualified test system with an optimized variable and flexible turnkey approach. Considering the ever-changing demand on electrical drive systems within test systems, GE's Power Conversion is using its expertise to the most customized and flexible test system solutions.

GE also closely collaborates with customers throughout the lifecycle of a test system and avoids a "one-size-fits-all" approach: Each test system is designed to be bespoke and is best suited to test the specific product. This is key, since a test system must be reassembled on demand to adapt to the requirements and environments for testing new equipment.

As such, a good test system must be broad in scope, flexible, and variable while allowing the customer to tailor performance of product, providing space to imagine and create the next generation of innovation.

GE's test systems solutions are also highly robust, capable of sustaining thousands of hours of mechanical and electrical stress. By simulating the extreme environment conditions or worse-case scenario, it will push the boundaries of the new equipment to the



A GE test bench. (Courtesy: GE)

highest standard of reliability. GE has world-record test system solutions in the renewables industry. GE partnered with the Lindoe Offshore Renewables Center on one of the world's most advanced facilities to test wind-turbine nacelles with an output power of up to 10 MW.

In doing so, it aims to build a test system that will support the wind industry as a significantly safer and reli-

able supplier of renewable energy. By thoroughly testing all components and products in the development cycle, operators can create robust structures that support power generation globally. ✎

Source: GE

For more information, go to [www.gepowerconversion.com/industries/testing-solutions-services](http://www.gepowerconversion.com/industries/testing-solutions-services)

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## Wisconsin Oven Ships 10 Ovens for Turbine Components Manufacturer

Wisconsin Oven Corporation shipped 10 electrically heated enhanced duty walk-in series ovens, each a Model EWN. The ovens will be used for curing wind-turbine components.

The maximum temperature rating for all the ovens is 176 degrees F (80 degrees C). The chamber dimensions are 6'6" W x 4'0" L x 6'0" H.

The ovens have combination airflow which provides both horizontal and vertical upward airflow which maximizes heating rates and temperature uniformity of the product. Per the manufacturers request, the ovens required a temperature uniformity of  $\pm 2$  degrees C, and they actually achieved  $\pm 1$  degrees C in practice.

The ovens also include a Eurotherm Nanodac paperless digital recorder with 50 MB of flash memory. This feature allows the manufacturer to store three months of data at a time.

"We strive to design our equipment to provide the best quality part results for our customers," said Mike Grande, senior application engineer. "In this case, we guaranteed a very tight temperature uniformity to help create consistent end results."

Unique features of this batch oven include:

- Temperature uniformity of  $\pm 1$  degrees C.
- Digital Eurotherm 3504 programmable temperature controller.
- Increased recirculation fan CFM and HP to achieve the guaranteed temperature uniformity.
- Additional thermocouple probes inside the ovens.
- Increased heating chamber width by 6 inches to provide clear width of 79 inches with the doors opening at 90 degrees.
- An additional pushbutton station at the front of the



Ovens like these from Wisconsin Oven will be used to cure wind-turbine components. (Courtesy: Wisconsin Oven Corporation)

oven for operator convenience.

- Increased heaters from 8 kW to 12 kW.

The walk-in ovens were fully factory tested and adjusted prior to shipment from Wisconsin Oven's facility. All safety interlocks were checked for proper operation, and the equipment was operated at the normal and maximum operating temperatures.

An extensive quality assurance check list was completed to ensure the equipment met all Wisconsin Oven quality standards. The industrial conveyor oven is backed by Wisconsin Oven's 5-year warranty. This warranty covers all materials for all components (less wear items).  $\blacktriangledown$

*Source: Wisconsin Oven Corporation*

For more information,  
go to [www.wisoven.com](http://www.wisoven.com)

## Senvion Orders More Than 300 MW in Australia

Senvion, a leading global manufacturer of wind turbines, has signed a conditional contract with Nexif Energy for the EPC contracts and maintenance agreements for the 25 turbine Glen Innes Wind Farm in New South Wales and the 59 turbine Lincoln Gap Wind Farm in South Australia.

"We are particularly happy to announce this contract with Nexif Energy, only a short time after being selected as single preferred supplier," said Jürgen Geissinger, CEO of Senvion. "This highlights the strong product fit Senvion can provide for Australian projects."

Both wind farms will see the introduction of the new Senvion 3.6M140 turbine into the Australian market. Compared to its predecessor, the energy yield has been

increased by up to 20 percent at wind speeds of 7.5 m/s, and the lifetime has been extended by 25 percent from 20 to 25 years. Improvements to the blades have resulted in lower sound in all operating modes. Combined, the projects will deliver more than 300 MW of clean, renewable energy to Australian consumers.

Since starting operations in Australia in 2002, Senvion has installed 218 turbines from the Senvion 2-MW series with a cumulated rated power of more than 440 MW.  $\blacktriangledown$

*Source: Senvion*

For more information,  
go to [www.senvion.com](http://www.senvion.com)

## Ingeteam Takes Wind Converter Supplier Top Spot After Record Year

Ingeteam, an independent global supplier of electrical conversion equipment, has achieved a new record year for the deliveries of its wind-power converters worldwide.

With nearly 5 GW of new capacity added in 2016 alone, a total of 36,414 MW of wind turbines have been equipped with Ingeteam's technology since 1995, making the Spanish company the world's No. 1 supplier of wind-power converters.

Ingeteam's record performance was particularly impressive in large emerging wind markets, despite intense competition.

Deliveries to India and Brazil reached a peak volume of 1,268 MW and 837 MW, respectively, in 2016.

According to the Ministry of New and Renewable Energy (MNRE) of India, the country's total wind-power capacity has reached more than 28 GW, with an additional 3,612 MW installed in 2016 alone.

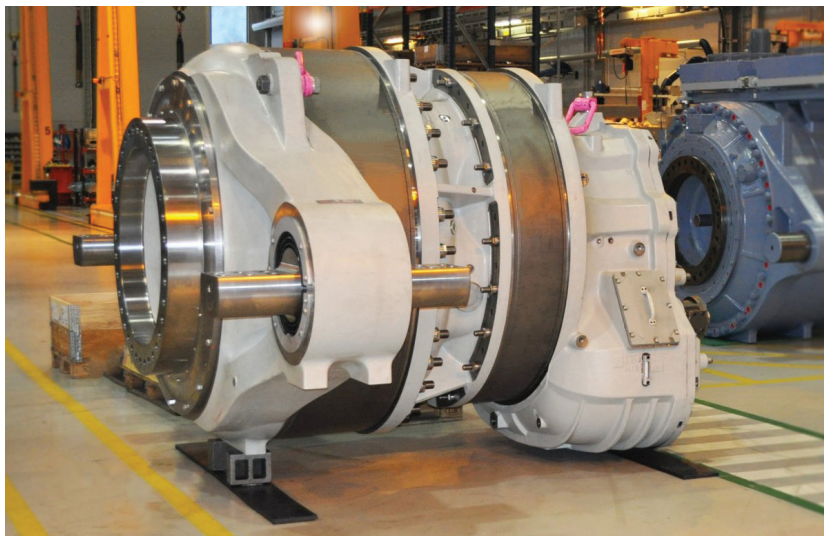
Ingeteam ended 2016 with more than 35 percent of the wind-power capacity installed in the country that year. To date, 9 percent of all wind-power capacity in India is equipped with Ingeteam's technology.

By December 2016, more than 10,740 MW was being generated by wind farms in Brazil, according to data from GWEC.

In 2016, installed capacity has increased by an additional 2,014 MW, which represents a 41 percent market share for Ingeteam for that year and 23 percent of the total market to date. ↵

*Source: Ingeteam*

For more information,  
go to [www.ingetteam.com](http://www.ingetteam.com)



The Exceed 4MW+ gearbox. (Courtesy: Moventas)

## Exceed 4MW+ Gearbox Passes Overload Test

Moventas has been developing a new product to the Exceed technology. The Exceed product platform was launched in 2014 with a 3MW+ gearbox with the best weight/nominal torque ratio in the market. A new Exceed 4MW+ will now be joining the product family.

The Exceed 4MW+ gearbox successfully completed a long-time overload test in January at Moventas Research and Technology center in Finland. The results in this lifecycle simulating test were great, with highest loads being more than double of the nominal power. Vibrational and sound behavior, operational functionality parameters, and load sharing on gears were on excellent level.

The 4MW+ gearbox has gone through an intensive verification process supervised by classification body, turbine manufacturer, and

Moventas experts. Next, the first gearboxes will be installed to a wind turbine for further validation measurements in actual operating conditions.

The new 4MW+ gearbox continues the success of the Moventas technology roadmap to implement the proven Moventas technologies with new innovations and design methods in the Exceed series to lower the cost of energy in wind-power generation.

Moventas already has delivered more than 1-GW Exceed technology gearboxes in the 3MW+ class, and the newcomer is another significant step to provide small-size, lightweight, and high-torque-density gearboxes to yet another power range of wind turbines. ↵

*Source: Moventas*

For more information,  
go to [moventas.com](http://moventas.com)

“ The first gearboxes will be installed to a wind turbine for further validation measurements. ”