

# DIRECTION

## THE FUTURE OF WIND



Policy commitments in California and industry confidence in exploiting lower value levels of the production tax credit justify a modest upgrade in the U.S. onshore sector. (Courtesy: AWEA)

# More than 680 GW of new wind power planned over next decade

More than 680 GW of new wind-power capacity will come online globally over the 10-year outlook, according to new research by Wood Mackenzie Power & Renewables.

Wood Mackenzie recently upgraded its Global Wind Power Market Outlook Update: Q4 2018 by 2 percent compared to the outlook published in the third quarter. Most upgrades occur in the medium-term, boosting annual capacity additions from 2020 to 2023 by an average of 2.7GW.

## EUROPEAN OFFSHORE MATURES

The maturation of the European offshore sector continues to be a strong driver of wind in the region.

“With 16 GW of offshore wind power capacity installed in Europe by the end of 2018 and more than 47 GW expected to come online in the region from 2018 to 2027, the European offshore sector continues to be a focal point of growth for the wind power industry,” said lead author Luke Lewandowski, director of Americas power & renewables research.

Several of the key upgrades analyzed in the fourth quarter outlook update highlight an indirect consequence of the European offshore experience: announced and expected offshore commitments from emerging offshore wind power markets.

“The European offshore wind power experience has encouraged governments in other regions to support offshore wind to comply with carbon reduction strategies and renewable energy targets as well as more firmly secure domestic power supply,” Lewandowski said.

Favorable announcements from the governments of Japan and South Korea resulted in a more than 1.5 GW upgrade quarter-on-quarter (QoQ). By the end of the 10-year outlook, this support will yield an installed offshore base of more than 2 GW in each country. A significant rate of growth, considering that neither country has

more than 100 MW of offshore wind power capacity installed today.

## ELECTIONS A MIXED BAG FOR AMERICA'S WIND MARKETS

The fledgling U.S. offshore market also received an upgraded QoQ.

“Attractive price signals are expected to motivate an increase in state-level procurement activity from both pioneering states, such as Massachusetts and New York, as well as new entrants over the long-term, such as California and Delaware,” Lewandowski said.

The upgrade will increase installed offshore capacity in the U.S. to approximately 10 GW by the end of 2027, representing 15 percent of all new capacity over the 10-year outlook.

Policy commitments in California and industry confidence in exploiting lower value levels of the production tax credit justify a modest upgrade in the U.S. onshore sector. Cost-out gains and higher production expectations from new turbine technology boost prospects for workable project economics under the phased down incentive.

In the Americas, election results in Brazil, Mexico, and Quebec, Canada, have affected or may affect the wind power outlook in these markets. Conservative wins in Brazil and Canada threaten the prospects for wind-power development in the long-term. The impact of a more liberal administration in Mexico is unclear, but the new government will need to address a balance between development and indigenous interests for the outlook to be fulfilled.

Demand in Australia's onshore sector headlines adjustments in Asia Pacific, as auction awards and financing commitments have flourished ahead of the market's renewable energy target deadline. Recent announcements result in a nearly 2GW upgrade to the outlook QoQ and increase project capacity under construction to 5GW.

## SCANDINAVIAN COUNTRIES CAUSE SIGNIFICANT CHANGES

Countries in Scandinavia, namely

Sweden, Norway, and Finland, represent the most significant changes to Wood Mackenzie's onshore wind power outlook this quarter. Increasingly competitive cost levels and an expectation for higher power prices across Europe have triggered a flurry of project investment announcements and power offtake commitments in the sub-region, specifically from the increasingly important corporate and industrial sector. With a more than 5-GW upgrade QoQ, these three countries will account for 15 percent of new onshore capacity installed in Europe over the next 10 years.

The Polish government awakened its recently dormant onshore market with the award of about 1 GW of capacity and the expectation of additional auction rounds. Downgrades in Ukraine and Russia QoQ, however, dampen the boost from Eastern Europe's largest wind-power market.

## GLOBAL WIND-TURBINE ORDER INTAKE ON THE RISE

Firm offshore turbine order intake in China through three quarters comprised about 25 percent of order intake in the market, indicating the increasing importance of the offshore sector to the local industry. Although the 10-year outlook for China's offshore sector remains unchanged QoQ, the strong turbine order activity in 2018 confirms China's rising position as the leading global market in the offshore sector, as it will account for nearly a third of new offshore capacity added globally from 2018 to 2027.

Global order intake capacity increased 28 percent YoY in Q3/2018 and is up nearly 40 percent through the first three quarters of the year. Although the China market continues to drive firm turbine order volume, there are plenty of encouraging signs from other regions, particularly in Africa. The share of order intake capacity from the offshore sector grows as demand proliferates globally. Although not all order announcements include



In recent years, new products were released at an accelerated pace, with OEMs embracing an evolutionary strategy that led to the new breed of 4.X MW turbine platforms, which left a series of 3.X turbines in their wake. (Courtesy: Vestas)

a specific project location, the assumption is that a large share of this segment is destined to fulfil safe harbor orders in the U.S. market ahead of incentive expiration.

**MORE INFO** [www.woodmac.com](http://www.woodmac.com)

## ArcVera Renewables hires industry expert Gordon Randall

ArcVera Renewables (ArcVera), an international consulting and technical services company specializing in wind and solar energy, recently announced the appointment of Gordon Randall as director of Project Analysis.

At ArcVera Renewables, Randall provides senior level oversight on client deliverables, with emphasis on developing and reviewing analysis methods, and participates in due diligence, energy assessment, and engineering reviews.

During his career in wind energy, which began in 2000, Randall has acquired vast expertise and experience working in multiple sectors, including finance, government, development, and manufacturing. Previously, Randall managed the wind-resource assessment team at Enel Green Power

N.A., conducting analysis on internal projects as input to the firm's investment decisions as well as due diligence and verification of third-party wind resources and energy assessments for potential M&A. At Enel, he also worked extensively with turbine technologies, spanning layout optimization, suitability analysis, and production performance improvement, in addition to assessment of repowering aging wind farms. From 2000 to 2013, Randall worked at Det Norske Veritas, performing energy assessments, technical due diligence, research, and con-



Gordon Randall will be director of Project Analysis at ArcVera Renewables. (Courtesy: ArcVera)

sulting services.

"Gordon has a rare combination of skills that every company in the space wants to have on the inside," said John Bosche, president and principal engineer at ArcVera Renewables. "He has inherent aptitudes for detecting problems, deriving insights, and seeing the bigger picture, plus the know-how to share that vision effectively; we're excited to welcome him."

"Gordon also carries the gravitas of a recognized industry leader who is frequently featured as a speaker and moderator at wind industry conferences and events," he said.

"Much of the renewable energy industry is slow-moving and bureaucratic, but ArcVera Renewables is an adaptable, forward-thinking organization," Randall said. "One of the main draws for me is ArcVera's ability to deliver results with speed, flexibility, and efficiency."

**MORE INFO** [www.arcvera.com](http://www.arcvera.com)

## New tech investments to boost growing global market

Wind turbines are set to become even bigger and better in an effort to main-



tain consistent downward trends of Levelized Cost of Electricity (LCOE), according to new research by Wood Mackenzie Power & Renewables.

“Rapid technology developments have been a large driver of elevating wind to a competitive source of power generation globally,” said lead author and senior analyst Shashi Barla.

The latest edition of the Global Wind Turbine Technology Trends report forecasts rapid innovations up until 2027. These innovations are reducing LCOE on the latest turbines, while at the same time improving performance and reliability.

“Now that auction systems are driving down power prices worldwide, product and service evolution is paramount,” Barla said. “While the shift away from generous incentive mechanisms leads to a short-term market dip, the forecasted growth over the next decade makes the market ripe for innovation.”

To withstand the increasing price pressure associated with a stream of headlines heralding plummeting power-price bids, turbine OEMs are being forced to make large investments in technology. Companies with global operations, strong financial capabilities, and relationships with leading asset owners will harness these commercial advantages to cement their leadership in critical wind markets.

“We expect the global market share of the top five turbine OEMs to rise to more than 73 percent come 2027, compared to just 54 percent in 2016,” Barla said. “Fierce competition is also leading to shorter product lifecycles, as turbine OEMs introduce new product platforms to increase efficiency and performance. Our research predicts the newest platforms will have fewer product variants delivering the same demand volume, reinforcing the evolutionary product strategy approach many turbine OEMs are pursuing.”

“The rapid pace of new product introductions will only begin to slow down post-2020,” he said. “In recent years, new products were released at an accelerated pace, with OEMs em-



Mitja Schulz (left) succeeds Jan Willem Ruinemans (right) as head of the ZF Wind Power Technology Business Unit.

bracing an evolutionary strategy that led to the new breed of 4.X MW turbine platforms. This left a series of 3.X turbines in their wake with barely a chance to recoup their tooling costs.”

According to the research, the U.S., Latin America, and eventually smaller emerging wind markets will transition to 4.X turbines, which were previously expected to be limited to the European market, in the next two years.

The turbine ASP (Average Selling Price) per megawatt has declined by 28 percent since 2010; however, the AEP (Annual Energy production) per megawatt has increased in excess of 50 percent during the same period. As developers are showing proclivity toward merchant PPAs (Power Purchasing Agreements), turbine OEMs are working toward sub 30 euros/MWhr LCOE turbines to address this demand.

**MORE INFO** [www.woodmac.com](http://www.woodmac.com)

## ZF Wind Power Technology CEO steps down

After more than eight years, Jan Willem Ruinemans is leaving ZF in March 2019. Ruinemans leaves the company at his own request in mutual agreement and wishes to seek new challenges outside the company.

Ruinemans joined the company in 2010 and became CEO of ZF Wind Pow-

er Technology in January 2013. During this time, he led the acquisition and integration of Hansen Transmissions and Bosch Wind Gearboxes into ZF Wind Power Technology, one of the global leaders in gearbox solutions for the wind-energy industry.

“Jan Willem Ruinemans was instrumental in growing successfully ZF’s wind gearbox business,” said a ZF board member. “Under his leadership, the company has built a solid position worldwide, with a strong customer base and a unique product portfolio. The ZF Board would like to thank Jan Willem for his vision and efforts during his time at ZF and we wish him all the best in his future challenges.”

Mitja Schulz was nominated as new head at ZF Wind Power Technology. He will assume his new position March 1, 2019, allowing a smooth transition together Ruinemans.

Schulz joined ZF in 2009. During his years at ZF, he has taken up roles in continuously increasing responsibility in Purchasing and Supplier Management and is currently head of Business Unit Commercial Vehicle Steering Systems in Lafayette, Indiana. In this function, he successfully managed the integration of the former TRW business into the ZF group. Prior to joining ZF, Schulz worked in multiple roles at Robert Bosch GmbH in Stuttgart and Porsche AG in their R&D center in Weissach, Germany. ↘

**MORE INFO** [www.zf.com](http://www.zf.com)