

# MHI Vestas Offshore Wind



## Cost of offshore wind falls

Offshore wind power continues to mature as a fast-growing renewable energy technology. As the offshore industry grows and technology improves, various players turn to offshore as a realistic solution for deploying large-scale wind power plants.

In recent years, the offshore wind power industry has made considerable progress in reducing levelised cost of energy (LCOE), the most visible evidence stemming from the Danish and Dutch tender systems. Even though some of the difference in support levels obtained in those markets can be explained by different wind conditions at the respective sites, the main progress derives from technology improvements and increased competition in the market, from companies like MHI Vestas Offshore Wind.

Observers of the global offshore industry expect it to grow by approx 10 to 20 percent per year over the medium term<sup>1)</sup>, however, coming from a small base of 1.4 GW of accumulated installations in 2016.<sup>2)</sup>

The northern European markets remain the most mature offshore markets with UK and Germany expected to be the largest. Installations are, however, also expected in countries such as the Netherlands, Belgium, France, and Denmark in coming years.

The US offshore industry took a major step during 2016 after the legislature in Boston, Massachusetts passed a bill mandating the state's utilities to procure 400 MW of offshore wind power in 2017 on route to 1.6 GW installed by 2027. It is expected that USA will commission its first large-scale offshore wind power plant around 2020.

Increasingly, forecasters are also expecting Asia Pacific to grow its offshore wind power installations.<sup>3)</sup> China already has an established market, while new offshore wind markets such as Taiwan and Japan are exploring the opportunities to install large-scale offshore wind power plants.

## Good order activity in 2016

During the year, the joint venture MHI Vestas Offshore Wind announced four firm and unconditional orders for the following projects: Blyth project in the UK (42 MW), Horns Rev III project in Denmark (406 MW), Norther project in Belgium (370 MW) and the Aberdeen Bay project in the Scotland (92 MW). Furthermore, the joint venture also announced that it had been appointed preferred supplier for the Deutsche Bucht project in Germany (252 MW) and a small project at lake Eire in the USA – Icebreaker (21 MW). With the announcement of Borssele III & IV (2 x 340 MW), the company also ended the year by adding another preferred supplier agreement to the list - a milestone project for the offshore industry in cost competitiveness with a reported price of EUR 54.50 per MWh (excluding transmission costs).

Based on these levels of order activity, the joint venture finds itself well positioned as one of the strongest players in the offshore market. MHI Vestas Offshore Wind has been a very active participant in the market, and has generally had a presence in most tenders taking place since its formation.

## All V164-8.0 MW turbines installed at Burbo Bank Extension

During 2016, MHI Vestas Offshore Wind completed installation of the first large-scale commercial project based on the V164-8.0 MW wind turbine at DONG Energy's 258 MW Burbo Bank Extension project off the coast of Liverpool, UK. The project started installation in September, where the first of 32 V164-8.0 MW wind turbines was installed, with the last wind turbine being installed in December. The Burbo Bank Extension project will set a new benchmark as the first large-scale offshore project to utilise the world's most powerful wind turbine.

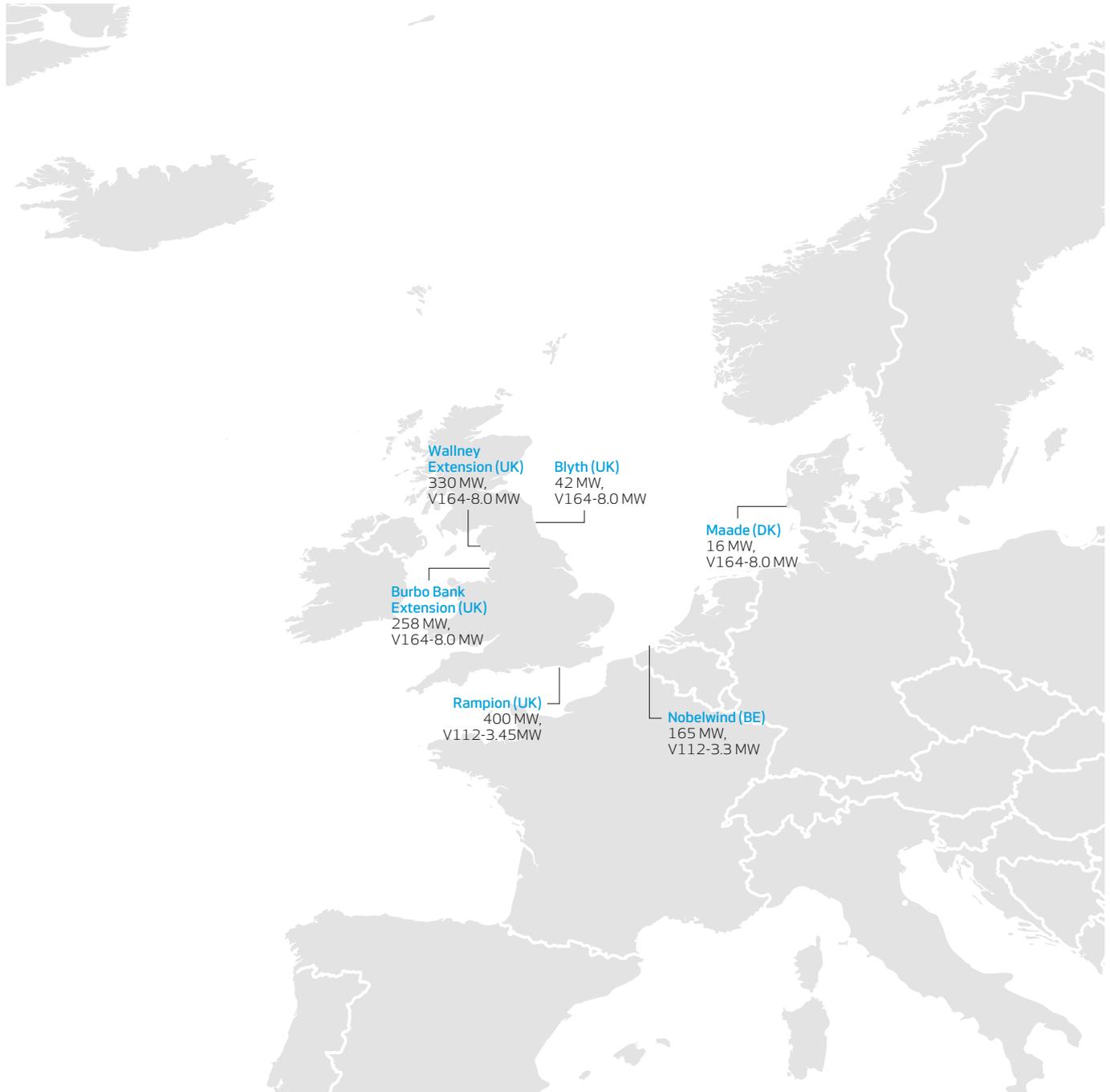
Most of the blades for the project have been produced at the manufacturing facility on the Isle of Wight, off the southern coast of the UK – the first facility with the capacity to serial produce blades for future UK offshore projects.

1) Sources: Bloomberg New Energy Finance : Q4 2015 Global Wind Market Outlook. November 2015; MAKE Consulting: Global Wind Power Market Update. August 2016.

2) Based on 1.2 GW of total installed offshore capacity by end 2015 (Source: Global Wind Energy Council: Global Wind Report 2015. April 2016) and an estimated 1,802 MW of added capacity in 2016 (Source: MAKE Consulting: Global Wind Power Market Update. November 2016).

3) Source: MAKE Consulting: Global Offshore Wind Power Market. December 2016.

## Delivered projects in 2016 and projects currently under work-in-progress



### Ramping up for higher activity

During the year, MHI Vestas Offshore Wind has almost completed delivery of the 165 MW Nobelwind project located in Belgium, comprising 50 V112-3.3 MW turbines.

As planned, the joint venture ramped-up production of the V164-8.0 MW turbine in anticipation of delivery of the 258 MW Burbo Bank Extension project, the 330 MW Walney Extension project, and the 42 MW Blyth project in 2017, all located in the UK. Further, it is planned for the coming financial year that MHI Vestas Offshore Wind will hand-over 116 V112-3.45 MW turbines for the 400 MW Rampion project in the UK.

During 2016, MHI Vestas Offshore Wind has recruited and trained over 500 employees due to increased demand. The production ramp-up is progressing according to plan.

### Financial guidance

MHI Vestas Offshore Wind continues to enjoy success in the marketplace and activity levels are expected to continue to increase with factories ramping up for new installations of V164-8 MW projects. In the short-term, this will adversely impact earnings. In addition, large amortisations of the 8 MW platform will likewise impact financial performance.

Accordingly, MHI Vestas Offshore Wind expects to double its revenue over the next three years (based on the latest completed joint venture fiscal year) while EBITDA is expected to reach break-even by 2018 while pre-tax profit is anticipated to reach break-even by 2019.

The expected development is in line with previous internal expectations and the strong financial position secured during the first years of operation is tailored to cope with this strategy.