

Offshore Windfarm forum

19 May 2014, Copenhagen

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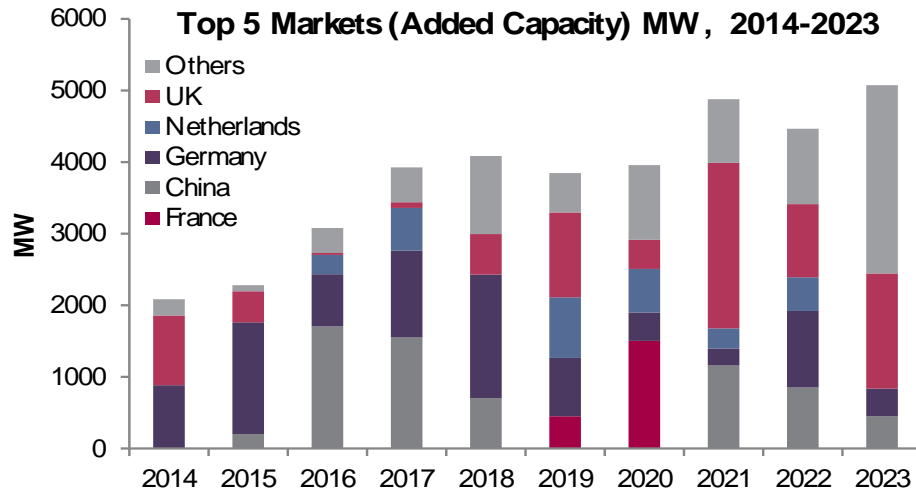
Offshore Wind Market Forecast

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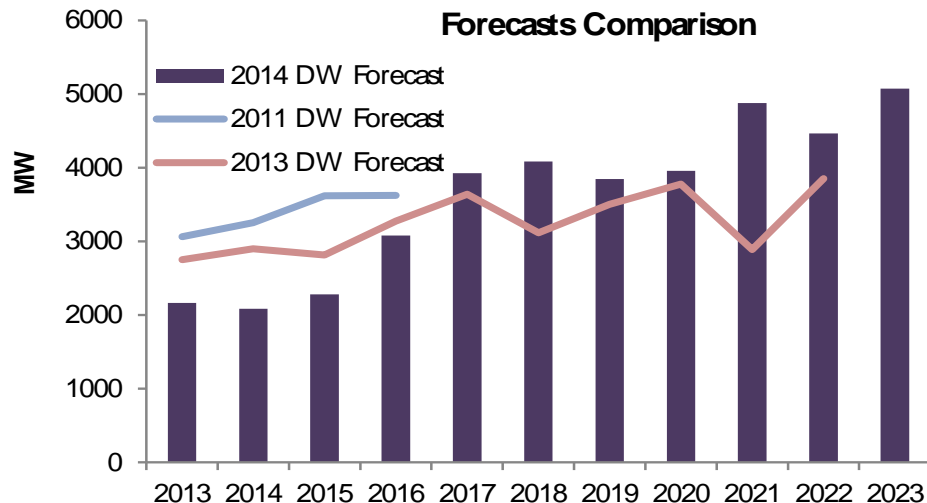
Offshore Wind Market – Key Countries

	MW by 2023	Key Points	Policy Update
	9,000	<ul style="list-style-type: none"> • Strong industrial base • Market has been slow to ramp up • Problems with offshore transmission system 	<ul style="list-style-type: none"> • Prospective political decisions to reform the Renewable energy Sources Act are critical for medium- and long-term progress • New laws governing the provision and planning process for the transmission system development
	8,600	<ul style="list-style-type: none"> • The largest existing market • Offshore expertise transferred from oil & gas • Current uncertainty over political support 	<ul style="list-style-type: none"> • New incentive mechanism from 2017 (ROCs to be replaced by Feed-in Tariffs and Contracts for Difference) • Ongoing discussions with Westminster with regard to lack of certainty in the Contracts for Difference regime and specific industry support measures • Ongoing political squabbles threaten industry progress
	6,600	<ul style="list-style-type: none"> • Slow market development despite ambitious plans • No significant developments expected before 2015 	<ul style="list-style-type: none"> • Current level of Feed-in Tariffs is seen as too low to support industry development • A more encouraging incentive mechanism would make a large proportion of the currently consented 4GW of wind farms more viable.
	3,000+	<ul style="list-style-type: none"> • Early pioneer emerging from a 5-year hiatus • Domestic expertise in offshore construction • Promising pipeline of 9 projects 	<ul style="list-style-type: none"> • Political decisions on areas including licensing, support mechanisms, infrastructure and targets are critical for the offshore wind industry.
	1,900+	<ul style="list-style-type: none"> • Plans in place for offshore wind sector. • Round 1 includes ca. 2GW (4 wind farms planned) and Round 1.5 – two more wind farms with additional 1GW 	<ul style="list-style-type: none"> • A generous feed-in tariff (well above the international average) is expected to be the main driver for the growth of the French offshore wind sector.

Market Forecast – Capacity



- The UK, Germany, China, Netherlands and France represent the largest markets over the forecast period
- These markets account for over three quarters of the total capacity installed over the next 10 years.
- 8.6 GW of new capacity is expected in the UK with 9 GW in Germany and 6.6 GW in China.
- The Netherlands is expected to return to prominence after a 5-years hiatus, installing 3GW of offshore wind generating capacity by 2023.
- France represents an active emerging market, with projects starting to come online in the second half of the forecast period and reaching nearly 2GW of installed capacity by 2023.

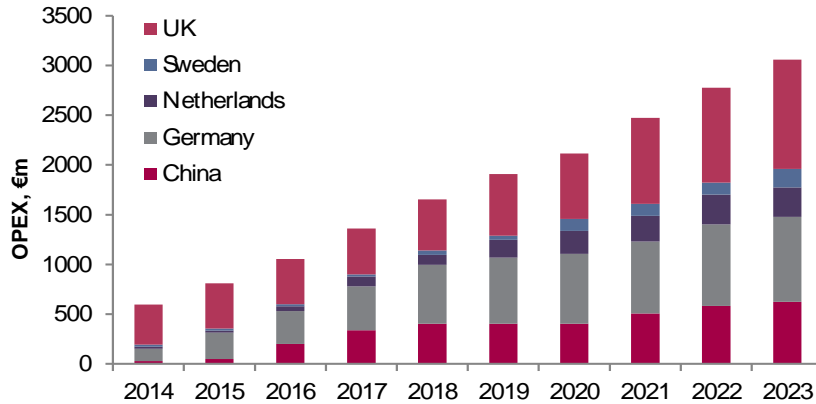


- Delays to projects have been common in the emerging offshore wind industry. As a consequence the number of project coming online has been consistently below expectations (see chart opposite).
- The main reasons for project delays are uncertainty about political support and unresolved technical and financial challenges.
- DW expect global cumulative capacity to exceed 44GW by 2023 assuming that the key issues causing projects delays will be resolved in due course.

Offshore Wind Market – Near-term Spending

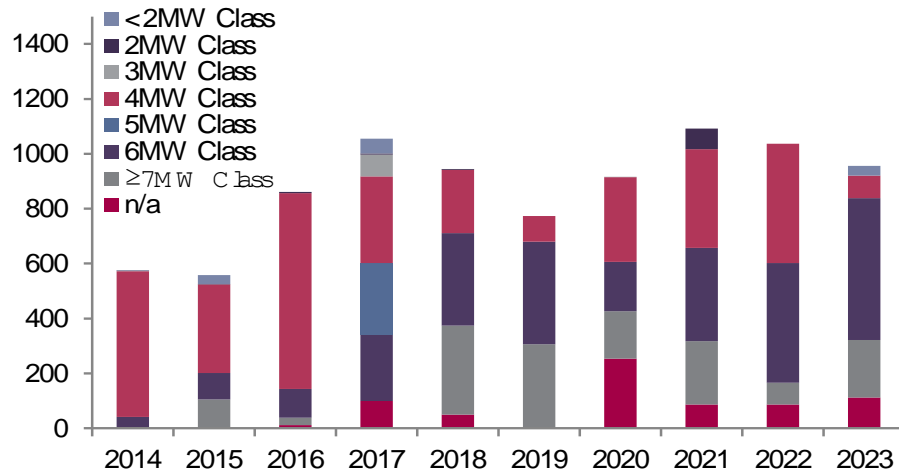
	Project Volume	Capacity Online	Project Countries	Project CAPEX
2014	• 7 Projects Online	• 2,065 MW	• Germany, UK, Belgium	• €8,130 m
2015	• 10 Projects Online	• 2,189 MW	• Germany, UK, China	• €9,017 m
2016	• 13 Projects Online	• 2,900 MW+	• China, Belgium, Germany, the Netherlands, South Korea	• €11,000 m+

- The next three years will be important for the offshore wind industry in order to build momentum and justify major supply chain investments by the industry.
- 30 projects are expected to be completed in this period with activity concentrated on the Western European region.
- Germany will be an important market but progress is dependent on successful build-out of the offshore transmission infrastructure.

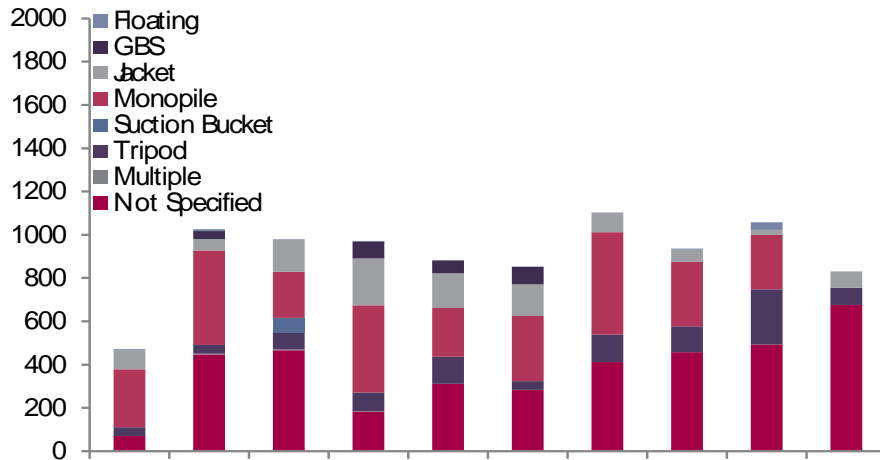


- Average current capital costs are expected to remain between €3.5m-€4m per MW installed over the forecast period.
- Over the next ten years operational expenditure will total €22.4bn with the majority of spending in the UK and German markets.
- The market growth profile is much smoother than the Capex profile with reduced risk for companies that specialise in providing O&M services.

Market Forecast – Turbines & Support Structures



- The 4 MW class of offshore wind turbines will continue to be utilised over the next 10 years due to their proven track record.
- The share of higher capacity wind turbines will increase over the forecast period, with nearly 55% of all turbines installed by 2023 expected to be of 6 MW or larger size.
- Siemens is expected to remain the leading supplier of offshore wind turbines over the next 10 years due to extensive experience and its proven designs.
- Competition is ramping up in the marketplace with manufacturers based in the Asia-Pacific region expected to have 20% of the market by 2023.



- By volume, monopile structures will remain the leading type of support structure over the next ten years.
- Monopile structures are typically well suited to the shallow water projects and seabed conditions encountered.
- The proportion of tripod and jacket foundations will increase significantly, as projects move into deeper waters and further from shore..