

First Half
2014

Deutsche
WindGuard

STATUS OF OFFSHORE WIND ENERGY DEVELOPMENT IN GERMANY

On behalf of:



Power Systems



Bundesverband WindEnergie



STATUS OF OFFSHORE WIND ENERGY DEVELOPMENT

The development of offshore wind energy in Germany is steadily proceeding. The factsheet presented here provides insight into the status of offshore wind energy development as of 30 June 2014. Table 1 shows the data for new construction during the first half of 2014 and the cumulative construction data for offshore wind energy in Germany.

Table 1: Offshore Wind Energy Development as of 30 June 2014

	Status of Offshore Wind Energy Development	Capacity [MW]	Number [OWT]
New Construction 1 st half of 2014	OWTs with Grid Connection	108.0	30
	Installed OWTs w/o Grid Connection	542.7	126
	Foundations w/o OWT		158
Cumulative (30 June 2014)	OWTs with Grid Connection	628.3	146
	Installed OWTs w/o Grid Connection	829.3	199
	Foundations w/o OWT		315

Grid-Connected Capacity

In the first half of 2014, 30 offshore wind turbines (OWT) with a cumulative capacity of 108 MW were connected to the grid. All of these OWTs had been erected in 2013. By 30 June 2014, a total of 146 OWTs located in German territorial waters with a capacity of 628.3 MW were feeding into the grid.

The progress of offshore wind energy development since 2008 with respect to grid-connected OWTs is illustrated in Figure 1. OWTs that had been installed but were not feeding into the grid

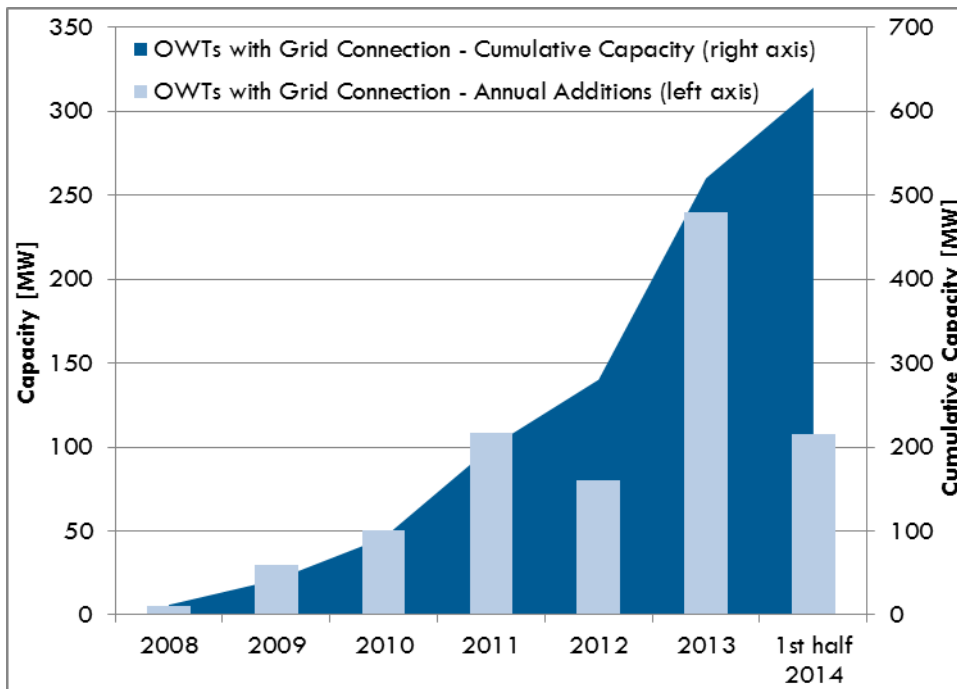


Figure 1: Development of Offshore Wind Energy in Germany (OWTs with Grid Connection), Status: 30 June 2014

yet were not included in Figure 1. The capacity connected to the grid during the first half of 2014 is comparable to that of the first half of the previous year.

Installation Activities

In addition, the installation efforts in a number of offshore wind farms (OWF) are steadily pushed forward. A total of 126 OWTs with a cumulative capacity of 542.7 MW were installed in the first half of 2014. None of these OWTs were feeding into the grid by the end of the first half of 2014. All in all, by 30 June 2014 199 OWTs with a capacity of 829.3 MW are completed and ready for their connection to the grid. In addition, the 158 foundations installed during the first half of 2014 had not yet been outfitted with OWTs. The cumulated number of completed foundations ready for OWTs totaled 315 by 30 June 2014.

Development Target

The current political target set by the federal government of Germany for offshore wind energy requires the installation of 6,500 MW in total by 2020. How much of this target has either been reached or is in solid implementation (meaning that at least the construction of the OWT foundation had commenced) by 30 June 2014 is examined below. It was found that about 3,275.5 MW of offshore capacity is either under construction, installed or already connected to the grid. This equates to 50.4 % of the 6,500 MW required by 2020. Figure 2 illustrates an overview of these numbers and also shows how much additional capacity is still necessary to achieve the 2020 expansion target set by the German government.

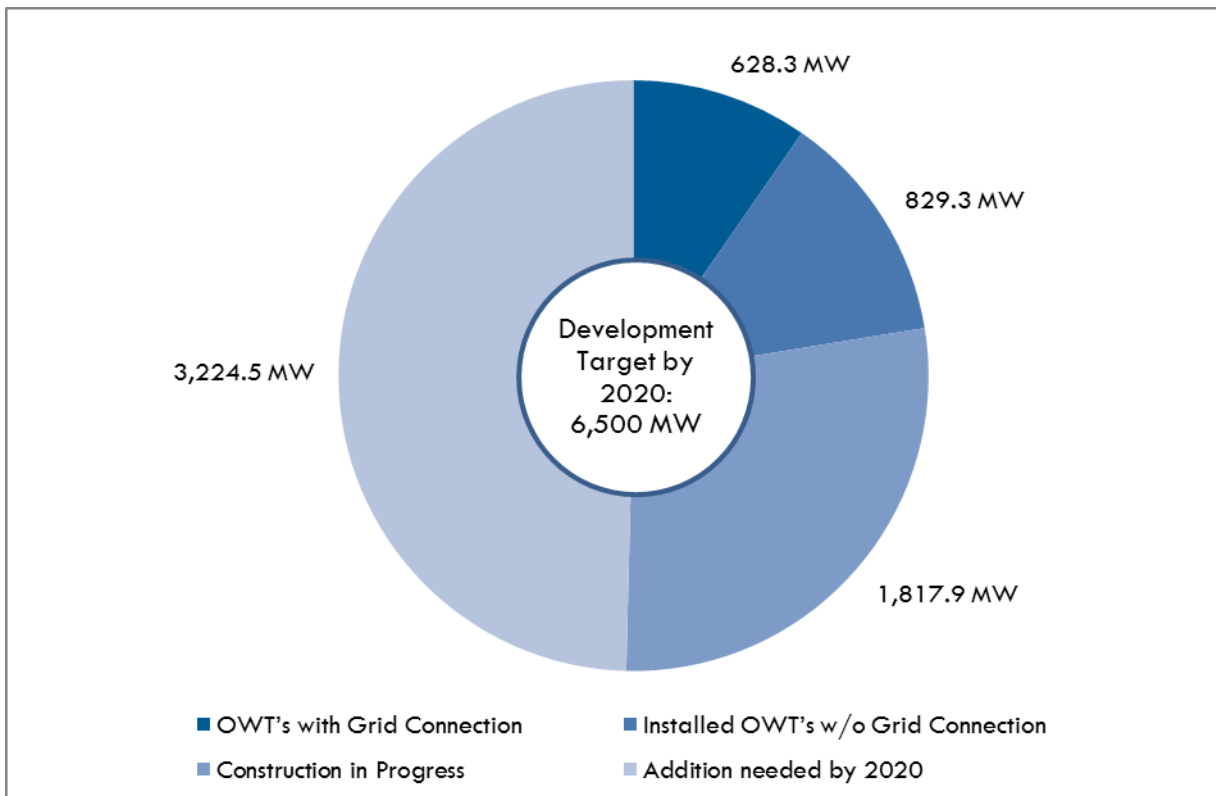


Figure 2: Offshore Capacity in solid Implementation (meaning at least being under construction) and its Part in the Development Target of the German Federal Government of 6,500 MW by 2020

TURBINE LOCATION

The distribution of grid-connected and installed OWTs, as well as completed OWT foundations for the first half of 2014 between the North and Baltic Seas is shown in Table 2. Additionally, the cumulative status of the development for both offshore regions is identified. During the first half of 2014, all installation activities occurred in the North Sea. This includes the latest project to be connected to the grid. Although there is one project under construction in the Baltic Sea, there were no completed OWTs or foundations to be considered for the relevant time frame.

Overall, by 30 June 2014, a total of 577.5 MW were connected to the grid in the North Sea, compared to 50.8 MW in the Baltic Sea. Moreover, there are 199 installed OWTs without grid connection and 276 completed foundations in the North Sea. There are 39 foundations ready for OWT installation in the Baltic Sea.

Table 2: Construction Distribution across the North and Baltic Seas, Status: 30 June 2014

Regional Distribution		North Sea		Baltic Sea	
		Capacity [MW]	Number [OWT]	Capacity [MW]	Number [OWT]
New Construction 1 st half of 2014	OWTs with Grid Connection	108.0	30	0.0	0
	Installed OWTs w/o Grid Connection	542.7	126	0.0	0
	Foundations w/o OWT		158		0
Cumulative (30 June 2014)	OWTs with Grid Connection	577.5	124	50.8	22
	Installed OWTs w/o Grid Connection	829.3	199	0.0	0
	Foundations w/o OWT		276		39

TURBINE CONFIGURATION

Table 3 shows that the average nameplate capacity of OWTs connected to the grid during the first half of 2014 was 3.6 MW. The average rotor diameter was 120 m and the average hub height was 90 m. Since only one project was connected to the grid, its turbine technology dictates the average. Compared to OWTs connected to the grid during 2013, the average nameplate capacity decreased (average at that time: 5 MW).

Table 3 also shows the characteristics of the total grid-connected OWT portfolio: it possesses an average nameplate capacity of 4.3 MW, an average rotor diameter of 117.3 m and an average hub height of 88.7 m.

Table 3: Average Turbine Configuration of OWTs with Grid Connection, Status: 30 June 2014

Average Turbine Configuration of OWTs with Grid Connection	New Construction on 1. Half of 2014	Total
Average Nameplate Capacity [kW]	3,600	4,303
Average Rotor Diameter [m]	120.0	117.3
Average Hub Height [m]	90.0	88.7

OFFSHORE WIND FARMS UNDER CONSTRUCTION

Towards the end of the first half of 2014, a total of seven OWFs were under construction. Two OWFs were fully completed, but had not yet received their grid connections. Another OWF, already fully completed in 2013, received its grid connection during the first half of 2014. All OWFs that were connected to the grid, installed and those under construction in the North Sea during 2014 are depicted in Figure 3. The one OWF under construction in the Baltic Sea is shown in Figure 4.

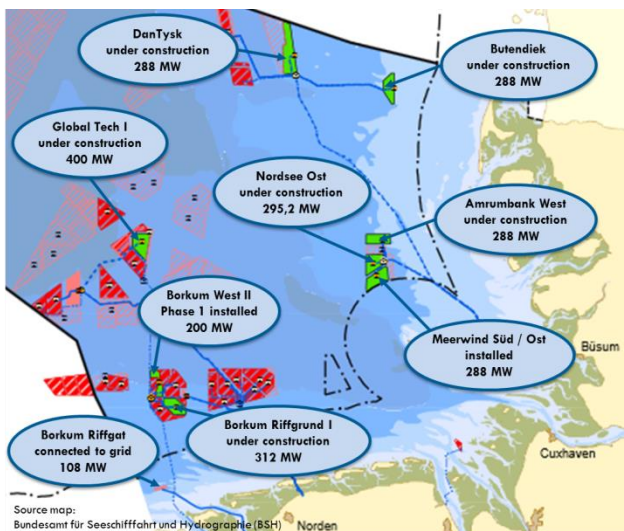


Figure 3: Offshore Wind Farms under Construction, Completed and Grid-Connected in the North Sea in the first half of 2014

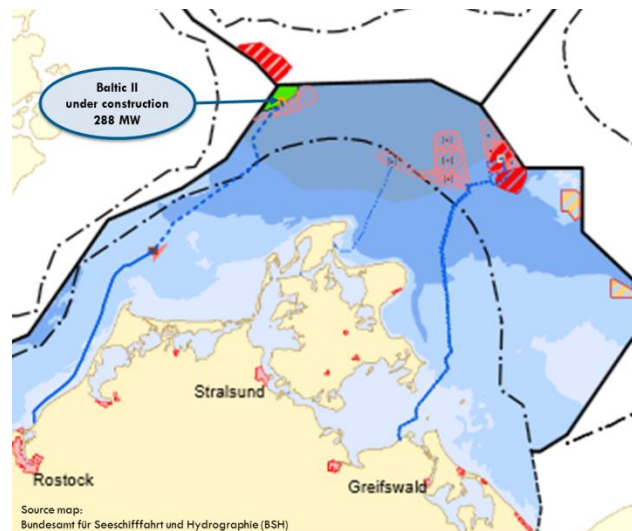


Figure 4: Offshore Wind Farms under Construction in the Baltic Sea in the first half of 2014

The OWF Borkum Riffgat, located in the North Sea, was connected to the grid in the beginning of 2014 and feeds a total capacity of 108 MW into the grid. OWF Borkum West II (Phase 1) and OWF Meerwind Süd / Ost were fully installed in the first half of 2014, but had not yet been connected to the grid. During that same time, OWTs were erected in the OWFs DanTysk, Global Tech I and Nordsee Ost. Foundation installations took place in the North Sea OWFs Amrumbank West, Borkum Riffgrund I and Butendiek. Pre-piling for the upcoming jacket installation was completed for the OWF Baltic II in the Baltic Sea.

Data Collection and Adaptation:

Deutsche WindGuard GmbH

Silke Lüers, Anna-Kathrin Wallasch,
Dr.-Ing. Knud Rehfeldt

Translation: Martin Schmidt-Bremer Jr.

www.windguard.com