DEUTSCHE WINDGUARD

Status of Offshore Wind Energy Development in Germany

First Half of 2026

On behalf of

BWE Bundesverband WindEnergie

BWO Bundesverband Windenergie Offshore e.V.

FOUNDATION OFFSHORE WIND ENERGY

VDMA Power Systems

wab It's only possible with wind

WindEnergy Network

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Notes

The data was obtained through surveys of industry representatives as well as through additional research, the current status of the key planning documents as of the time of the survey is decisive. Retroactive adjustments to the data are made if required.

The installed capacity of offshore wind energy projects may be lower or higher than the assigned grid connection capacity.

Future offshore wind energy projects are assigned with their total capacity to the respective expected year of full commissioning of the project.

The information provided in the text and figures partially includes rounded values. Therefore, when values are aggregated, deviations from the overall totals may occur.

Photo on Title Page

Turbine Installation OWP Nordseecluster A
© RWE / Matthias Ibeler

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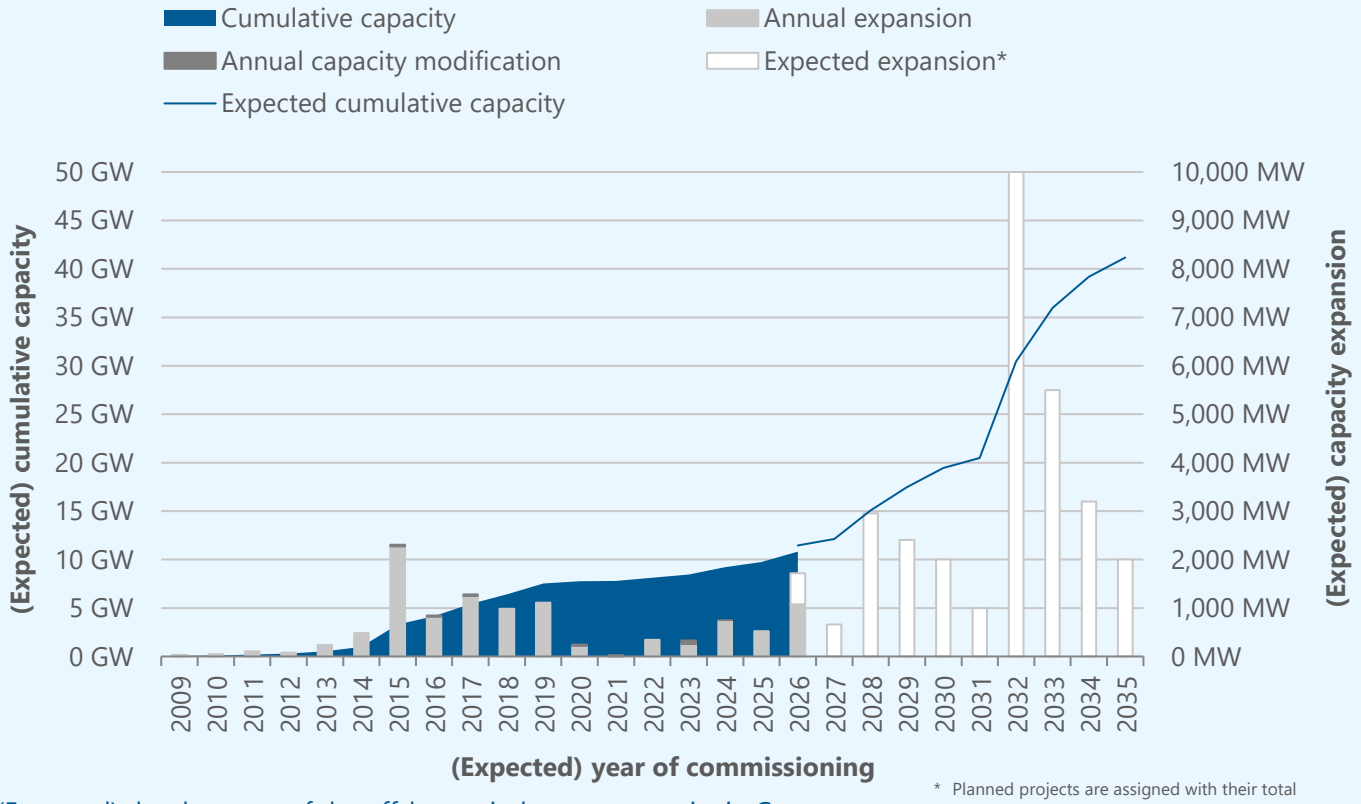
Offshore Wind Energy Development

As of June 30, 2026, 1,764 offshore wind turbines (OWT) with a total capacity of around 10.8 GW are in operation in Germany. In the first half of 2026, 84 offshore wind turbines with a total capacity of 1.1 GW fed electricity into the grid for the first time. Including the turbines installed in the first half of 2026, there are a total of 1,786 offshore wind turbines off the German coast as of mid-2026; 22 of these turbines have not yet started feeding electricity into the grid and have therefore not yet been commissioned. In addition, 65 foundations have been installed in the seabed and are expected to be equipped with offshore wind turbines in the coming months.

A significant increase in total installed capacity in Germany is planned for the next ten years. This requires a high annual rate of expansion and the commissioning of all planned offshore wind turbines according to schedule.

Status of the offshore wind energy development

		Capacity	Number
Development H1 2026	OWT (feeding in)	1,077 MW	84 OWT
	Capacity modifications of existing OWT	0 MW	0 OWT
	Installed OWT (no feed-in)	75 MW	5 OWT
	Foundations w/o OWT		No Foundations
Cumulative 2026-06-30	OWT (feeding in)	10,818 MW	1,764 OWT
	Installed OWT (no feed-in)	323 MW	22 OWT
	Foundations w/o OWT		65 Foundations



(Expected) development of the offshore wind energy capacity in Germany
(Database: own surveys, MaStR, Draft second amendment FEP 2025)

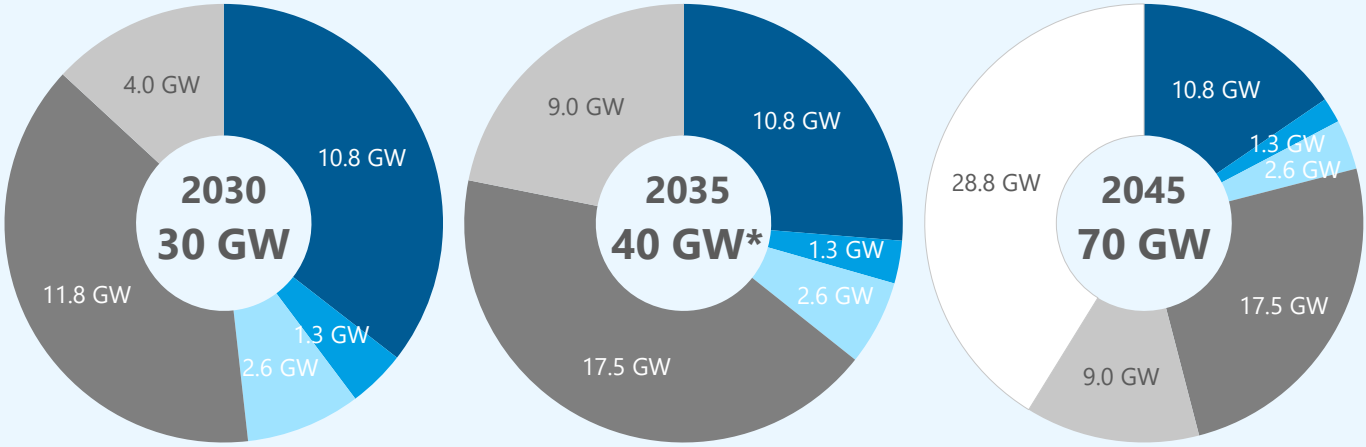
* Planned projects are assigned with their total expected project capacity to the year of the expected full commissioning. The actual commissioning of partial project sections may differ.

Expansion Targets Offshore Wind Energy

The expansion targets for offshore wind energy are defined in the German Offshore Wind Energy Act (German: Windenergie-auf-See-Gesetz or WindSeeG). It specifies that the installed capacity of turbines connected to the grid is to be increased to at least 30 GW by 2030, to at least 40 GW by 2035 and to at least 70 GW by 2045.

To achieve these targets, the Federal Maritime and Hydrographic Agency (German: Bundesamt für Seeschifffahrt und Hydrographie or BSH) continuously sets new specifications for future expansion in the Site Development Plan (German: Flächenentwicklungsplan or FEP), particularly regarding wind energy sites and the associated grid connections, the calendar years for tenders and commissioning. The FEP 2025 was published in January 2025, followed by the first amendment in January 2026 and the draft of the second amendment in June 2026. The first amendment provided for the postponement of tenders and commissioning for some sites and grid connections. The draft of the second amendment provides for further postponements as well as the cancellation of tenders.

Overall, the current plans extend to 2035 and encompass a total capacity of approximately 41 GW. As of mid-year, this capacity is at various stages of development. A total of 10.8 GW is already in operation, another 1.3 GW is under construction, and a final investment decision has been made for 2.6 GW. Less advanced in terms of project implementation are 17.5 GW that have been awarded or have a grid connection claim, and 9 GW that have so far only been designated for tenders and have not yet been awarded to any project developer. As a result, the 2030 expansion target can no longer be met in time; the 2035 target could be achieved if all projects are implemented as planned; and further specifications are still needed regarding the 2045 target.



* Contrary to the legal expansion target, the Offshore Realisation Agreement from November 2022 between the federal government, the six northern federal states and the three responsible transmission system operators stipulated that the legal expansion target of 40 GW should be exceeded and that 50 GW should already be installed by 2035.

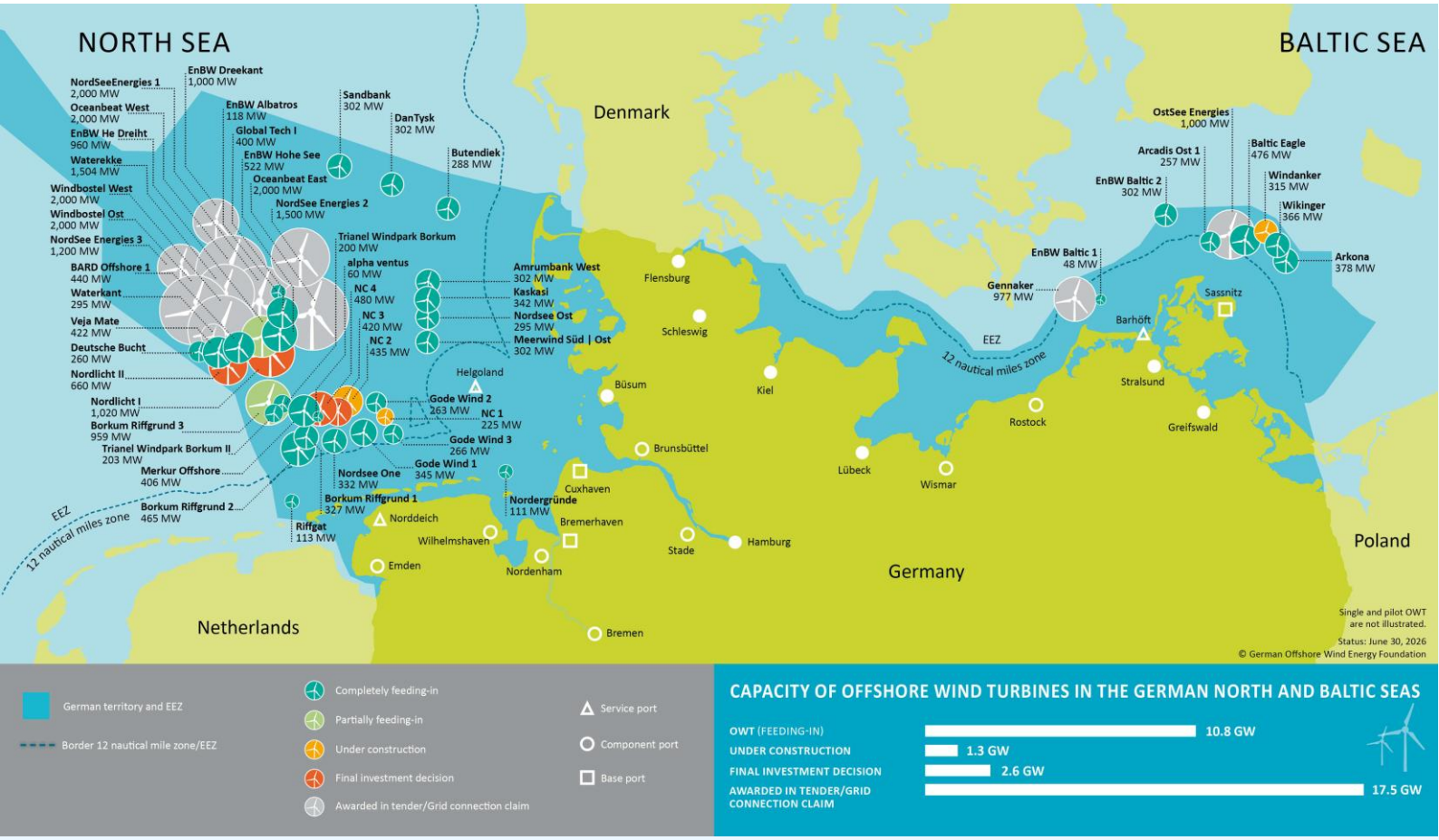
Development status of offshore wind energy capacity with expansion targets by 2030, 2035 and 2045 (Database: own surveys, MaStR, Draft second amendment FEP 2025)

Activities in Offshore Wind Energy Projects

As of mid-2026, 31 offshore wind energy projects (OWP) are fully operational in Germany. The installation of the turbines in the Borkum Riffgrund 3 OWP was completed in early 2025. In the EnBW He Dreiht project, the installation of the turbines is mostly completed. In both projects, the majority of the offshore wind turbines have already been commissioned; the remaining turbines are scheduled to follow in the second half of 2026. In the North Sea Cluster A (NC 1 and NC 2) as well as in the Windanker project, the foundations were successfully installed by the end of 2025. In North Sea Cluster A, turbine installation began in June 2026. These works began at the Windanker project in July 2026, which is the second half of 2026. Construction on the OWP Nordlicht I also began in July 2026. Another 15 projects are still in earlier stages of development and implementation.

Overview of future offshore wind energy projects

OWP	Status	Expected commissioning	Expected capacity
Borkum Riffgrund 3	Partially feeding-in	2026	959 MW
EnBW He Dreiht	Partially feeding-in	2026	960 MW
Windanker (O-1.3)	Under construction	2026	315 MW
NC 1 (N-3.7)	Under construction	2027	225 MW
NC 2 (N-3.8)	Under construction	2027	435 MW
Nordlicht I (N-7.2)	FID	2028	1,020 MW
Nordlicht II (N-6.6)	FID	2028	660 MW
Gennaker	Grid connection claim	2028	977 MW
Waterkant (N-6.7)	Awarded	2028	295 MW
NC 3 (N-3.5)	FID	2029	420 MW
NC 4 (N-3.6)	FID	2029	480 MW
Waterekke (N-9.3)	Awarded	2029	1,504 MW
Oceanbeat West (N-12.2)	Awarded	2030	2,000 MW
OstSee Energies (O-2.2)	Awarded	2031	1,000 MW
Windbostel Ost (N-9.1)	Awarded	2032	2,000 MW
NordSee Energies 1 (N-12.1)	Awarded	2032	2,000 MW
Windbostel West (N-9.2)	Awarded	2032	2,000 MW
Oceanbeat East (N-11.1)	Awarded	2033	2,000 MW
EnBW Dreekant (N-12.3)	Awarded	2033	1,000 MW
NordSee Energies 2 (N-11.2)	Awarded	2033	1,500 MW
Nordsee Energies 3 (N-9.4)	Awarded	2034	1,200 MW

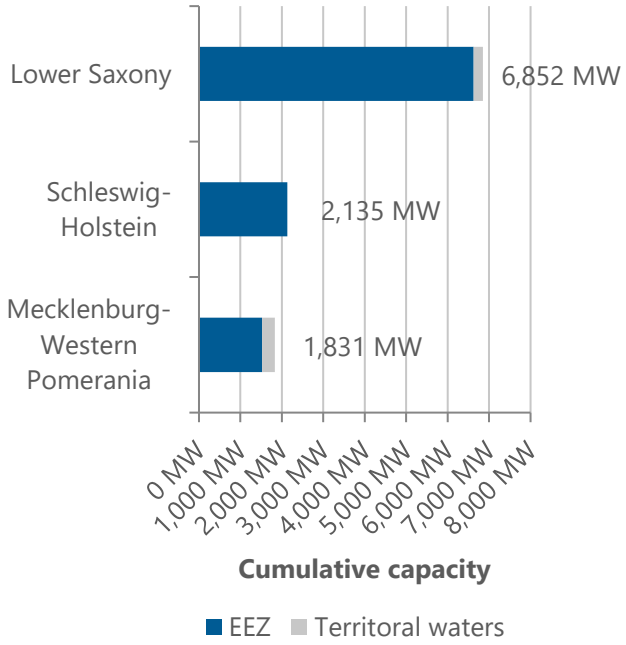


Overview map of offshore wind energy in Germany (© German Offshore Wind Energy Foundation)

Distribution across Federal States and North and Baltic Sea

The installed capacity of German offshore wind turbines connected to the grid as of June 30, 2026, is predominantly located in the North Sea (9.0 GW). The Baltic Sea accounts for considerably less capacity (1.8 GW). There is also a clear focus in terms of distribution between the Exclusive Economic Zone (EEZ) and territorial waters: most of the offshore wind turbines in the North Sea and Baltic Sea are installed in the EEZ (10.3 GW), with only a few turbines installed in territorial waters (0.5 GW).

The capacity installed at sea can be allocated to the German federal states based on the location of the respective grid connection point. Lower Saxony accounts for around 6.9 GW of the installed capacity in the North Sea and Schleswig-Holstein for 2.1 GW. The installed capacity of 1.8 GW in the Baltic Sea is fully connected to the grid of Mecklenburg-Western Pomerania.



Distribution of cumulative capacity of OWT (feeding in) across the federal states and maritime areas

Distribution across the North and Baltic Sea

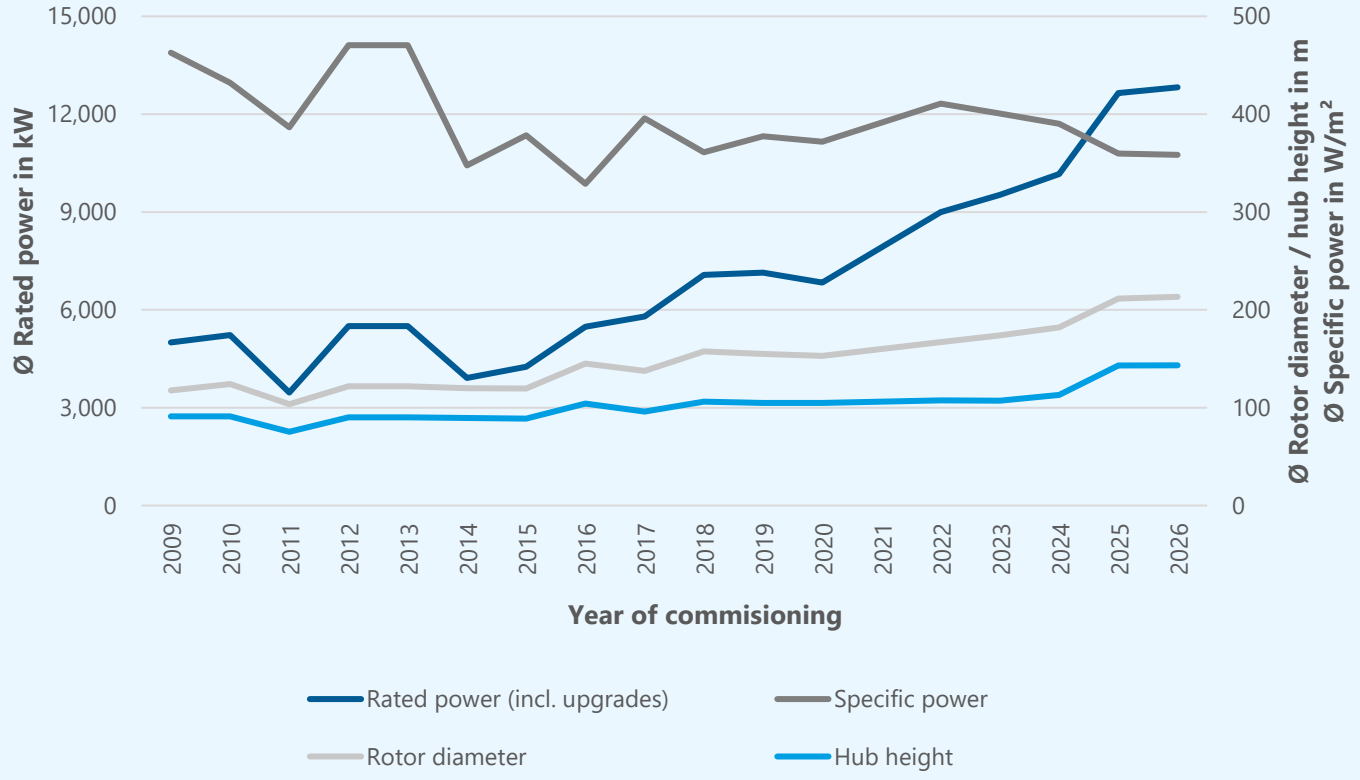
		North Sea		Baltic Sea	
		Capacity	Number	Capacity	Number
Development H1 2026	OWT (feeding in)	1,077 MW	84 OWT	0 MW	0 OWT
	Capacity modifications of existing OWT	0 MW	0 OWT	0 MW	0 OWT
	Installed OWT (no feed-in)	75 MW	5 OWT	0 MW	0 OWT
	Foundations w/o OWT		No Foundations		No Foundations
Cumulative 2026-06-30	OWT (feeding in)	8,987 MW	1,455 OWT	1,831 MW	309 OWT
	Installed OWT (no feed-in)	323 MW	22 OWT	0 MW	0 OWT
	Foundations w/o OWT		44 Foundations		21 Foundations

Turbine Configuration

With the expansion of offshore wind energy in Germany, the technology of offshore wind energy turbines has also undergone continuous development. The offshore wind turbines in operation in the German North Sea and Baltic Sea as of June 30, 2026, have an average turbine capacity of 6.1 MW. In 2025, the first offshore wind energy turbine with a capacity of 15 MW was installed and commissioned in Germany. Accordingly, current turbines have significantly higher capacities than those that have been commissioned in the past. This also applies to the rotor diameter and hub height. The existing turbines across all commissioning years have an average rotor diameter of 142 m and a hub height of 100 m. The turbines commissioned in 2026 show significantly higher values: an average capacity of 12.8 MW, an average rotor diameter of 213 m and an average hub height of 143 m. The ratio of installed capacity to rotor area, known as the specific power, of the new turbines has fallen slightly compared to the total installed portfolio.

Average offshore wind turbine configuration

Average Configuration	Cumulative 2026-06-30	Additions H1 2026
Rated power (incl. upgrades)	6,132 kW	12,823 kW
Rotor diameter	142 m	213 m
Hub height	100 m	143 m
Specific power	377 W/m²	359 W/m²



Turbine configuration over course of time

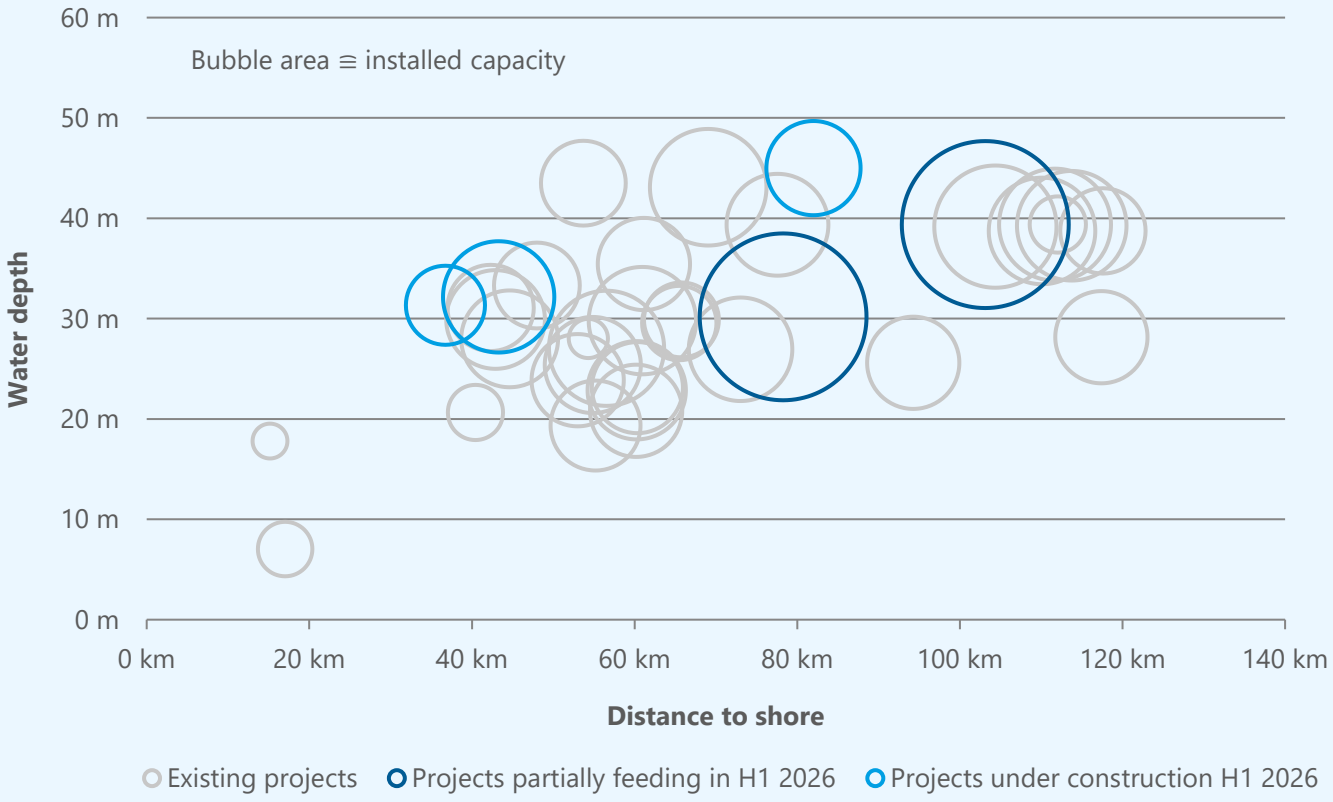
Water Depth and Distance to Shore

Most of the offshore wind energy projects off the German coast are located at least 40 km from the shore in water depths of 20 m or more; only a few projects are located in shallow waters close to the coast. Some of the projects are installed at locations up to 120 km from the shore and in water depths of over 40 m. On average, the existing projects have a water depth of approx. 31 m and a distance from the shore of approx. 73 km. The two projects, which had already begun operating with some of their turbines by mid-2026, have a greater average water depth and are also located further away from the shore than the existing projects. In the long term, the expansion of offshore wind energy will increasingly shift to offshore areas in the German EEZ further away from the shore.

With regard to foundation types, the monopile foundation has established its position as the most commonly used type in Germany. Since 2019, this type of foundation has been used in all German projects; other types of foundations have not been used since then. Future projects are also currently planning to use monopile foundations. Their dimensions are steadily increasing in parallel with those of the offshore wind turbines.

Average water depth and distance to shore

Average location	Existing projects 30.06.2026	Projects partially feeding-in H1 2026	Projects under construction H1 2026
Water depth	31 m	35 m	36 m
Distance to shore	73 km	91 km	54 km



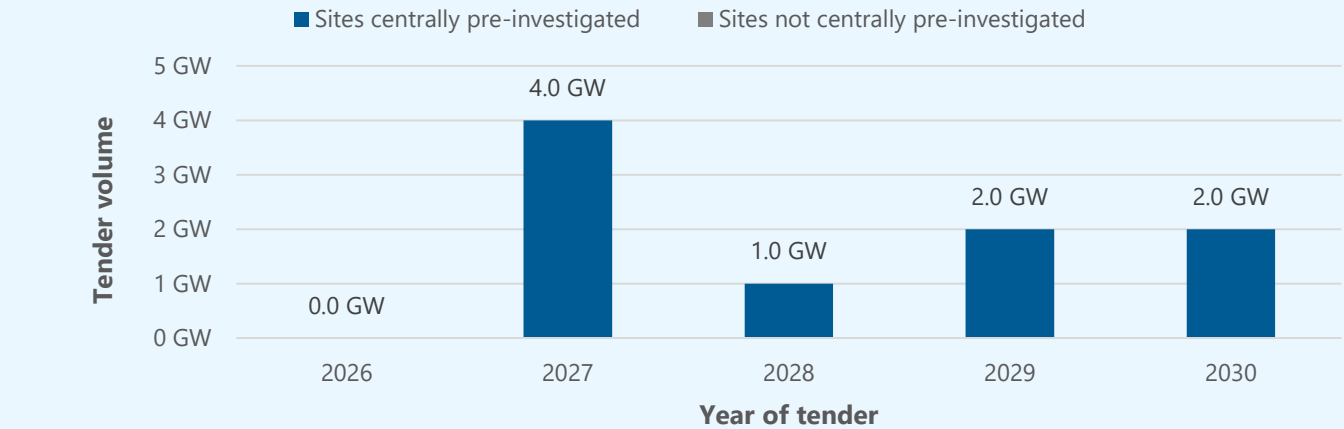
Water depth and distance to shore of existing projects, projects partially feeding-in and projects under construction

Tenders for Offshore Wind Energy

Since the year 2023, the Federal Network Agency (German: Bundesnetzagentur or BNetzA) conducts two tender rounds for offshore wind energy per year. A distinction is made between tenders for sites that have not been centrally pre-investigated and tenders for sites that have been centrally pre-investigated by the BSH. The tendering procedure differs depending on the type of site. The order in which sites are put out to tender, the year of the tender round, and the year of commissioning are specified in the FEP by the BSH.

In June 2025, the tender round for a site not centrally pre-investigated took place and following a dynamic bidding procedure, the N-9.4 site was successfully awarded. The tender round for two centrally pre-investigated sites (N-10.1 and N-10.2) in August 2025 received no bids. The German Offshore Wind Energy Act stipulates that in such cases, the sites shall be tendered in the next tender round. Accordingly, they should have been put out to tender again in June 2026. However, an amendment to the FEP 2025 in January 2026 stipulated a postponement to 2027, and other tender rounds were also postponed by one year. The draft of the second amendment from June 2026 provides for further postponements and the cancellation of the tender for two sites that were not centrally pre-investigated and initiates a consultation process regarding the site boundaries and the installed capacities of sites N-10.1 and N-10.2.

In total, the draft of the second amendment to the FEP 2025 includes seven centrally pre-investigated sites with a total capacity of 9 GW, which are to be put out to tender by 2030.



Site name (planned commissioning and capacity)	2026	2027	2028	2029	2030
Not centrally pre-investigated (■)					
Centrally pre-investigated (■)		N-10.1 (2032, 2 GW)*	N-9.5 (2033, 1 GW)	N-6.8 (2034, 2 GW)	N-12.6 (2035, 2 GW)
		N-10.2 (2032, 0.5 GW)*			
		N-13.1 (2032, 0.5 GW)			
		N-13.2 (2032, 1 GW)			

* Original capacity according to FEP 2025. The draft for the second amendment to FEP 2025 proposes various site boundaries and installed capacities as part of the consultation process.

Offshore sites for tenders 2026 to 2030 (Database: Draft second amendment FEP 2025)

Overview of Grid Connection Capacities

As of mid-2026, a total of 21 grid connection systems with a combined capacity of 9.9 GW are fully operational in Germany. Of these, 13 are located in the North Sea and 8 in the Baltic Sea. Two further grid connection systems are about to be finally commissioned. The first commissioning of a grid connection system in accordance with the new 2 GW standard is planned for 2029.

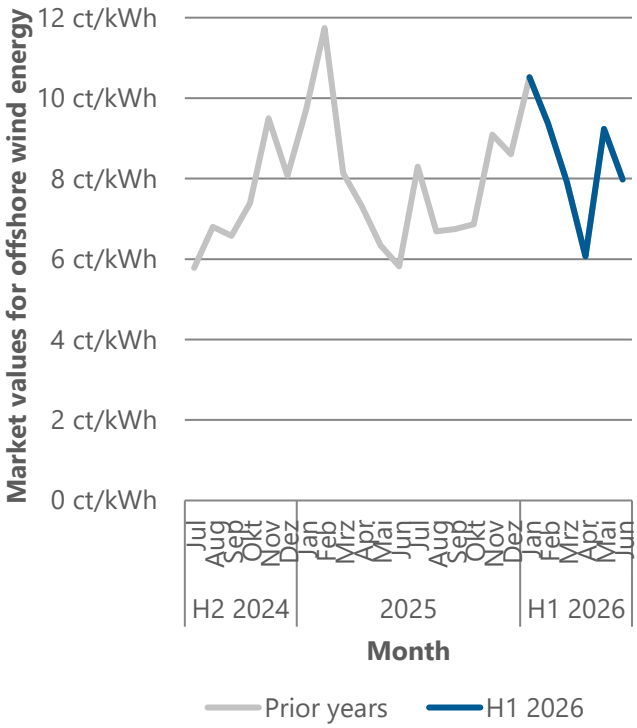
Installed and planned grid connections (to converter station or bundling point) in the North and Baltic Seas (Database: 2. Draft of grid development plan electricity 2037/2045, Draft 2. amendment FEP 2025, TSO, research)

Grid connection system	Status	(Excpected) commissioning	(Expected) capacity	(Preliminary) assigned offshore wind energy projects and sites
North Sea				
NOR-2-1 (alpha ventus)	In operation	2009	62 MW	alpha ventus
NOR-6-1 (BorWin1)	In operation	2010	400 MW	BARD Offshore 1
NOR-0-1 (Riffgat)	In operation	2014	113 MW	Riffgat
NOR-2-2 (DolWin1)	In operation	2015	800 MW	Borkum Riffgrund 1, Trianel Windpark Borkum, Trianel Windpark Borkum II
NOR-4-1 (HelWin1)	In operation	2015	576 MW	Meerwind Süd | Ost, Nordsee Ost
NOR-4-2 (HelWin2)	In operation	2015	690 MW	Amrumbank West, Kaskasi
NOR-5-1 (SylWin1)	In operation	2015	864 MW	Butendiek, DanTysk, Sandbank
NOR-6-2 (BorWin2)	In operation	2015	800 MW	Deutsche Bucht, EnBW Albatros, Veja Mate
NOR-3-1 (DolWin2)	In operation	2016	916 MW	Gode Wind 1, Gode Wind 2, Nordsee One
NOR-0-2 (Nordergründe)	In operation	2017	111 MW	Nordergründe
NOR-2-3 (DolWin3)	In operation	2018	900 MW	Borkum Riffgrund 2, Merkur Offshore
NOR-8-1 (BorWin3)	In operation	2019	900 MW	EnBW Hohe See, Global Tech I
NOR-3-3 (DolWin6)	In operation	2023	900 MW	Gode Wind 3, NC 1, NC 2
NOR-1-1 (DolWin5)	Ready for operation	2025	900 MW	Borkum Riffgrund 3
NOR-7-1 (BorWin5)	Ready for operation	2025	900 MW	EnBW He Dreiht
NOR-7-2 (BorWin6)	Under construction	2027	980 MW	Nordlicht I
NOR-3-2 (DolWin4)	Under construction	2028	900 MW	NC 3, NC 4
NOR-6-3 (BorWin4)	Under construction	2028	900 MW	Nordlicht II, Waterkant
NOR-9-3 (BalWin4)	Under construction	2029	2,000 MW	Waterekke, N-10.2
NOR-12-1 (LanWin1)	Under construction	2030	2,000 MW	NordSee Energies 1
NOR-12-2 (LanWin2)	Under construction	2030	2,000 MW	Oceanbeat West
NOR-9-1 (BalWin1)	Under construction	2031	2,000 MW	Windbostel Ost
NOR-9-2 (BalWin3)	Under construction	2031	2,000 MW	Windbostel West
NOR-10-1 (BalWin2)	Under construction	2031	2,000 MW	N-10.1
NOR-11-2 (LanWin4)	Under construction	2031	2,000 MW	NordSee Energies 2, N-13.1
NOR-13-1 (LanWin5)	Planned	2032	2,000 MW	EnBW Dreekant, N-13.2
NOR-11-1 (LanWin3)	Planned	2033	2,000 MW	Oceanbeat East
NOR-9-4 (BalWin5)	Planned	2033	2,000 MW	NordSee Energies 3, N-9.5
NOR-6-4 (BorWin7)	Planned	2034	2,000 MW	N-6.8
NOR-12-4 (LanWin7)	Planned	2034	2,000 MW	N-12.6
NOR-12-3 (LanWin6)	Planned	2035	2,000 MW	
Baltic Sea				
OST-3-1 (Baltic 1)	In operation	2011	51 MW	EnBW Baltic 1
OST-3-2 (Baltic 2)	In operation	2015	288 MW	EnBW Baltic 2
OST-1-1 (Ostwind 1)	In operation	2018	250 MW	Wikinger
OST-1-2 (Ostwind 1)	In operation	2019	250 MW	Arkona
OST-1-3 (Ostwind 1)	In operation	2019	250 MW	Arkona, Wikinger
OST-2-1 (Ostwind 2)	In operation	2023	250 MW	Arcadis Ost 1
OST-2-2 (Ostwind 2)	In operation	2024	250 MW	Baltic Eagle
OST-2-3 (Ostwind 2)	In operation	2024	250 MW	Baltic Eagle
OST-1-4 (Ostwind 3)	Under construction	2026	300 MW	Windanker
OST-6-1 (Gennaker)	Under construction	2028	927 MW	Gennaker
OST-2-4 (Ostwind 4)	Planned	2031	2,000 MW	OstSee Energies

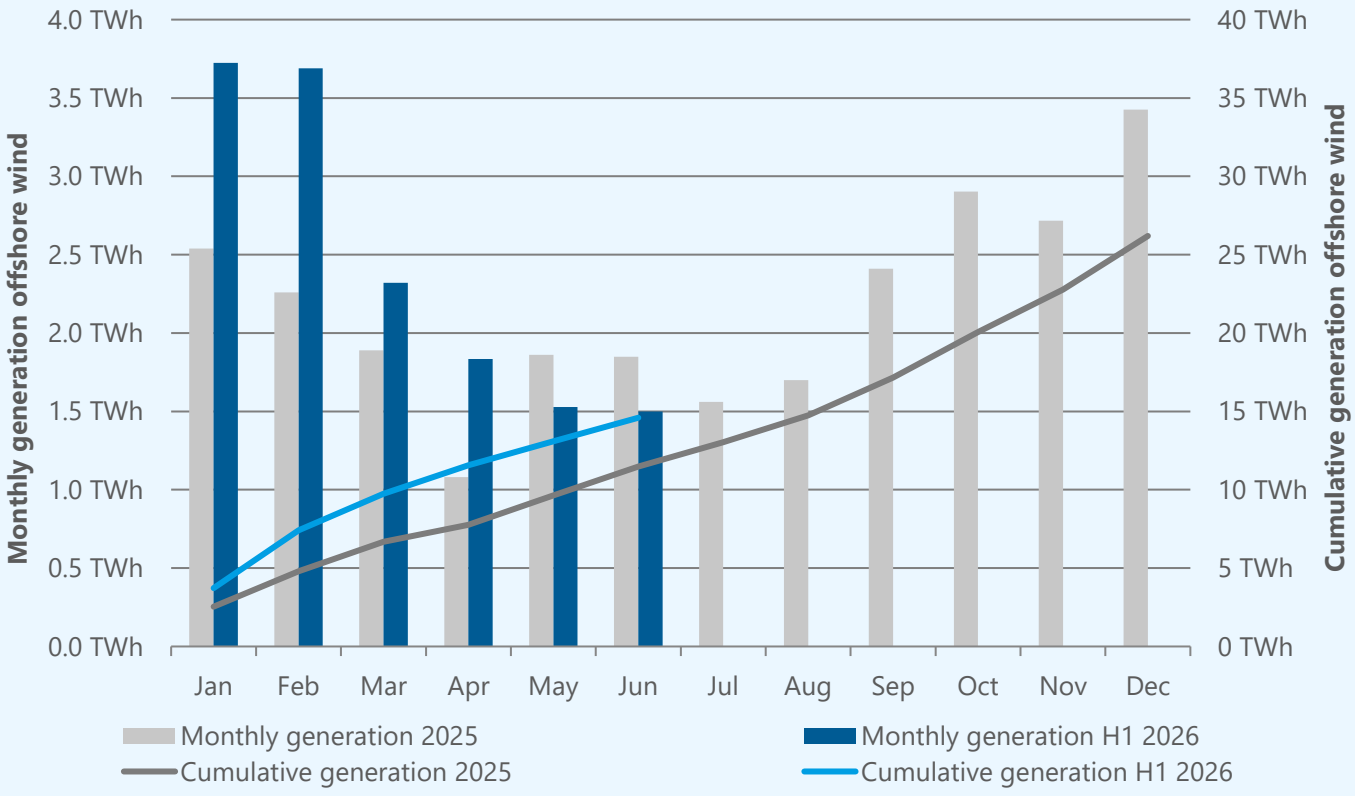
Power Generation and Market Values

During the first half of 2026, the monthly market values for electricity from offshore wind energy ranged from a minimum of 6.07 ct/kWh (April 2026) to a maximum of 10.52 ct/kWh (January 2026). On a volume-weighted average basis, the market value in the first half of 2026 amounted to 8.80 ct/kWh, which was higher than in the previous year 2025 (8.06 ct/kWh); the increase was 9%.

Offshore wind energy generated a total of 14.6 TWh of electricity in the first six months of 2026, accounting for 6.3% of Germany's total electricity generation. In January 2026, German offshore wind turbines reached their highest monthly generation of 3.7 TWh, while in June 2026, they recorded their lowest monthly generation of 1.5 TWh. Overall, electricity generation of offshore wind energy in the first half of 2026 was at a higher level than in the first half of 2025.



Monthly market values for offshore wind energy (Database: Netztransparenz)



Power generation offshore wind (Database: Bundesnetzagentur | SMARD.de)

About Deutsche WindGuard

In the complex energy market, Deutsche WindGuard is committed to providing unbiased, manufacturer-independent consulting and comprehensive scientific, technical and operational services.

About the German Windenergy Association (BWE)

The German Wind Energy Association (BWE) is a partner to more than 3.000 companies in the wind industry sector and represents the interests of its approximately 17.000 members. BWE pools the combined know-how of a diverse industry sector.

About the German Offshore Wind Energy Association (BWO)

The aim of the BWO is to represent the political interests of the offshore wind industry in Germany. The BWO acts as central point of contact for politicians and authorities at federal and state level for all questions relating to offshore wind energy.

About the German Offshore Wind Energy Foundation

The non-profit organization's overall purpose is to consolidate the role of offshore wind energy in the energy mix of the future in Germany and Europe and to promote its expansion in the interests of environmental and climate protection. Since 2005, it has been established as a non-partisan, supra-regional and cross-sector think tank as well as an independent communication platform for the entire offshore wind energy industry.

About VDMA Power Systems

VDMA Power Systems is the association for the power plant engineering. It represents the interests of manufacturers and suppliers of electricity and heat systems in Germany and abroad. These include wind energy, photovoltaic and hydropower plants, engines and thermal power plants as well as storage and sector coupling technologies.

About WAB e.V.

The WAB is the nationwide contact for the offshore wind industry, the onshore network in the Northwest and promotes the production of green hydrogen from wind power. The association includes around 250 smaller and larger companies as well as institutes from all areas of the wind industry, the maritime industry, the emerging hydrogen economy and science.

About WindEnergy Network e.V. (WEN)

The WEN is the leading company network for wind energy in the northeast region with over 90 member companies. The aim is to promote the expansion of companies and supply chains in order to enhance regional value creation in the future sector renewable energies. The key topics are windenergy on- and offshore, maritime technologies in connection with offshore windenergy as well as the development of green hydrogen.