OFFSHORE WIND FARMS IN THE GERMAN NORTH SEA / BALTIC SEA

NORTH SEA

Project Name	Area	Grid Connection	Location	Developer/Owner	Turbine Type	Number of OWT	Total Capacity [MW][1]	(Expected) Commissioning	Ø Distance to Shore [km]	Ø Water Depth [m]	Tender Round[6]
Operational (24)											
alpha ventus	2	NOR-2-1 (Alpha Ventus)	EEZ	DOTI (EWE, RWE, Vattenfall)	REpower 5M and AREVA Wind M5000-116	12	60	2010	54	28	
BARD Offshore 1	6	NOR-6-1 (BorWin1)	EEZ	Ocean Breeze Energy	Bard 5.0	80	440	2013	132	39	
Riffgat	0	NOR-0-1 (Riffgat)	12 NM Zone	EWE	Siemens SWT-3.6-120	30	113.4	2014	40	21	
Amrumbank West	4	NOR-4-2 (HelWin2)	EEZ	RWE	Siemens SWT-3.6-120	80	302.4	2015	60	21	
Borkum Riffgrund 1	2	NOR-2-2 (DolWin1)	EEZ	Ørsted and Greencoat Renewables	Siemens SWT-4.0-120	78	312	2015	55	25	
Butendiek	5	NOR-5-1 (SylWin1)	EEZ	Industriens Pension, Siemens Financial Services, Greencoat Renewables, ITOCHU Europe, Citigroup, Skyborn Renewables and Octopus Energy	Siemens SWT-3.6-120	80	288	2015	55	19	
DanTysk	5	NOR-5-1 (SylWin1)	EEZ	Vattenfall and Stadtwerke München	Siemens SWT-3.6-120	80	302.4	2015	94	26	
Global Tech I	8	NOR-8-1 (BorWin3)	EEZ	GE Ventures, Aspo International, ENTEGA and Stadtwerke München	AREVA Wind M5000-116	80	400	2015	110	39	
Meerwind Süd | Ost	4	NOR-4-1 (HelWin1)	EEZ	China Three Gorges Corporation and Windland	Siemens SWT-3.6-120	80	302.4	2015	53	24	
Nordsee Ost	4	NOR-4-1 (HelWin1)	EEZ	RWE	Senvion 6.2M126	48	295.2	2015	60	23	
Trianel Windpark Borkum	2	NOR-2-2 (DolWin1)	EEZ	Trianel	AREVA Wind M5000-116	40	200	2015	66	30	
Gode Wind 1	3	NOR-3-1 (DolWin2)	EEZ	Ørsted, Glennmont and The Renewables Infrastructure Group	Siemens SWT-6.0-154	55	344.5	2016	43	30	
Gode Wind 2	3	NOR-3-1 (DolWin2)	EEZ	Ørsted, AIP Management, Industriens Pension, Lærernes Pension and Lægernes Pensionskasse	Siemens SWT-6.0-154	42	263.1	2016	48	33	
Nordergründe	0	NOR-0-2 (Nordergründe)	12 NM Zone	Gothaer Leben Renewables, Skyborn Renewables and John Laing Group	Senvion 6.2M126	18	110.7	2017	17	7	
Nordsee One	3	NOR-3-1 (DolWin2)	EEZ	Northland Power and RWE	Senvion 6.2M126	54	332.1	2017	45	28	
Sandbank	5	NOR-5-1 (SylWin1)	EEZ	Vattenfall and Stadtwerke München	Siemens SWT-4.0-130	72	302.4	2017	117	28	
Veja Mate	6	NOR-6-2 (BorWin2)	EEZ	Commerz Real, Ingka Group, KGAL and ALH Group	Siemens SWT-6.0-154	67	422.1	2017	115	39	
Borkum Riffgrund 2	2	NOR-2-3 (DolWin3)	EEZ	Ørsted, Gulf Energy Development, Keppel Infrastructure Trust und Keppel Corporation	Siemens SWT-6.0-154	56	464.8	2018	57	26	
Merkur Offshore	2	NOR-2-3 (DolWin3)	EEZ	APG and The Renewables Infrastructure Group	Haliade 150-6MW	66	405.8	2019	61	30	
Deutsche Bucht	6	NOR-6-2 (BorWin2)	EEZ	Northland Power	Vestas V164-8.4 MW	31	260.4	2019	118	39	
EnBW Hohe See	8	NOR-8-1 (BorWin3)	EEZ	EnBW and Enbridge	Siemens SWT-7.0-154	71	521.9	2019	104	39	
EnBW Albatros	8	NOR-8-2 (BorWin2)	EEZ	EnBW and Enbridge	Siemens SWT-7.0-154	16	117.6	2020	112	39	
Trianel Windpark Borkum II	2	NOR-2-2 (DolWin1)	EEZ	EWE, ewz, Trianel and 17 municipal utilities	Senvion 6.2M152	32	202.6	2020	66	30	
Kaskasi	4	NOR-4-2 (HelWin2)	EEZ	RWE	Siemens Gamesa SG 8.0-167 DD Flex	38	342	2022	60	23	2018
Summary						1,306	7,105.8				
Under Construction (2)											
Gode Wind 3	3	NOR-3-3 (DolWin6)	EEZ	Ørsted and Glennmont	Siemens Gamesa SG 11.0-200 DD	23	265.7	2024	42	31	2017/18
Borkum Riffgrund 3	1	NOR-1-1 (DolWin5)	EEZ	Ørsted and Glennmont	Siemens Gamesa SG 11.0-200 DD	83	958.7	2025	78	30	2017/18
Awarded in Tender / Grid Connection Claim (11)											
EnBW He Dreiht	7	NOR-7-1 (BorWin5)	EEZ	EnBW, Allianz Capital Partners, AIP and Norges Bank	Vestas V236-15.0 MW	64	960	2025	104	40	2017
NC 1	3	NOR-3-3 (DolWin6)	EEZ	RWE	Vestas V236-15.0 MW	16	240	2027	43	31	2021
NC 2	3	NOR-3-3 (DolWin6)	EEZ	RWE	Vestas V236-15.0 MW	29	435	2027	50	31	2021
Nordlicht I	7	NOR-7-2 (BorWin6)	EEZ	Vattenfall		68	1,020	2028	90	38	2022
NC 3	3	NOR-3-2 (DolWin4)	EEZ	RWE	Vestas V236-15.0 MW	28	420	2029	50	31	2023 (centrally pre-investigated)
NC 4	3	NOR-3-2 (DolWin4)	EEZ	RWE	Vestas V236-15.0 MW	32	480	2029	50	31	2023 (centrally pre-investigated)
Nordlicht II	6	NOR-6-3 (BorWin4)	EEZ	Vattenfall			630	2028	105	39	2023 (centrally pre-investigated)
Waterkant	6	NOR-6-3 (BorWin4)	EEZ	Luxcara			270	2028	120	39	2023 (centrally pre-investigated)
N-11.1	11	NOR-11-1 (LanWin3)	EEZ	BP			2,000	2030			2023 (not centrally pre-investigated)
N-12.1	12	NOR-12-1 (LanWin1)	EEZ	TotalEnergies			2,000	2030			2023 (not centrally pre-investigated)
N-12.2	12	NOR-12-2 (LanWin2)	EEZ	BP			2,000	2030			2023 (not centrally pre-investigated)
Area for Future Tender [2] (15)											
N-9.1	9	NOR-9-1 (BalWin1)	EEZ				2,000	2029			2024 (centrally pre-investigated)
N-9.2	9	NOR-9-2 (BalWin3)	EEZ				2,000	2029			2024 (centrally pre-investigated)
N-9.3	9	NOR-9-3 (BalWin4)	EEZ				1,500	2029			2024 (centrally pre-investigated)
N-11.2	11	NOR-11-2 (LanWin4)	EEZ				1,500	2031			2024 (not centrally pre-investigated)
N-12.3	12	NOR-13-1 (LanWin5)	EEZ				1,000	2031			2024 (not centrally pre-investigated)
N-10.1	10	NOR-10-1 (BalWin2)	EEZ				2,000	2030			2025 (centrally pre-investigated)
N-10.2	10	NOR-9-3 (BalWin4)	EEZ				500	2030			2025 (centrally pre-investigated)
N-13.1	13	NOR-11-2 (LanWin4)	EEZ				500	2031			2026 (centrally pre-investigated)
N-13.2	13	NOR-13-1 (LanWin5)	EEZ				1,000	2031			2026 (centrally pre-investigated)
N-6.8	6	NOR-6-4 (BorWin7)	EEZ				2,000	2032			2027 (centrally pre-investigated)
N-9.4	9	NOR-9-4	EEZ				2,000	2032			2025 (not centrally pre-investigated)
N-14.1	14	NOR-14-1	EEZ				2,000	2033			2028 (centrally pre-investigated)
N-12.4	12	NOR-12-3	EEZ				2,000	2033			2026 (not centrally pre-investigated)
N-12.5	12	NOR-12-4	EEZ				2,000	2034			2027 (not centrally pre-investigated)
N-9.5	9	NOR-9-5	EEZ				2,000	2035			2028 (not centrally pre-investigated)
Area for Other Forms of Energy Generation (1)											
SEN-1[3]	8		EEZ								

GRID CONNECTIONS

Project	Type	Converter Platform	Capacity [MW]	Connecting Offshore Wind Farms	TSO	Contractor(s)	(Expected) Commissioning
NORTH SEA							
(Preliminary) Operational							
NOR-2-1 (Alpha Ventus)	AC		62	alpha ventus	TenneT	Transpower	2009
NOR-6-1 (BorWin1)	DC	BorWin alpha	400	BARD Offshore 1	TenneT	ABB, Transpower	2010
NOR-0-1 (Riffgat)	AC		113	Riffgat	TenneT	NKT	2014
NOR-2-2 (DolWin1)	DC	DolWin alpha	800	Borkum Riffgrund 1, Trianel Windpark Borkum, Trianel Windpark Borkum II	TenneT	ABB	2015
NOR-4-1 (HelWin1)	DC	HelWin alpha	576	Meerwind Süd | Ost, Nordsee Ost	TenneT	Siemens, Prysmian	2015
NOR-4-2 (HelWin2)	DC	HelWin beta	690	Amrumbank West, Kaskasi	TenneT	Siemens, Prysmian	2015
NOR-5-1 (SylWin1)	DC	SylWin alpha	864	Butendiek, DanTysk, Sandbank	TenneT	Siemens, Prysmian	2015
NOR-6-2 (BorWin2)	DC	BorWin beta	800	EnBW Albatros, Deutsche Bucht, Veja Mate	TenneT	Siemens, Prysmian	2015
NOR-3-1 (DolWin2)	DC	DolWin beta	916	Gode Wind 1, Gode Wind 2, Nordsee One	TenneT	ABB	2016
NOR-0-2 (Nordergründe)	AC		111	Nordergründe	TenneT	ABB	2017
NOR-2-3 (DolWin3)	DC	DolWin gamma	900	Borkum Riffgrund 2, Merkur Offshore	TenneT	GE, Prysmian	2018
NOR-8-1 (BorWin3)	DC	BorWin gamma	900	EnBW Hohe See, Global Tech I	TenneT	Siemens, Petrofac, Prysmian	2019
NOR-3-3 (DolWin6)	DC	DolWin kappa	900	Gode Wind 3, NC 1, NC 2	TenneT	Siemens, Dragados, Nexans	2023
Under Construction							
NOR-1-1 (DolWin5)	DC	DolWin epsilon	900	Borkum Riffgrund 3	TenneT	Keppel, Aibel, ABB, Prysmian	2025
NOR-7-1 (BorWin5)	DC	BorWin epsilon	900	EnBW He Dreiht	TenneT	Siemens, Dragados, NKT	2025
NOR-7-2 (BorWin6)	DC	BorWin kappa	980	Nordlicht I	TenneT	McDermott, GEERI/C-EPR, Nexans	2027
NOR-3-2 (DolWin4)	DC	DolWin delta	900	NC 3, NC 4	Amprion	Siemens, Dragados, Prysmian	2028
NOR-6-3 (BorWin4)	DC	BorWin delta	900	Nordlicht II, Waterkant	Amprion	Siemens, Dragados, Prysmian	2028
Planned[2]							
NOR-9-1 (BalWin1)	DC		2,000	N-9.1	Amprion		2030
NOR-9-2 (BalWin3)	DC		2,000	N-9.2	Amprion		2031
NOR-9-3 (BalWin4)	DC		2,000	N-9.3, N-10.2	TenneT		2029
NOR-10-1 (BalWin2)	DC		2,000	N-10.1	Amprion		2030
NOR-11-1 (LanWin3)	DC		2,000	N-11.1	50Hertz		2030
NOR-12-1 (LanWin1)	DC		2,000	N-12.1	TenneT		2030
NOR-12-2 (LanWin2)	DC		2,000	N-12.2	TenneT		2030
NOR-11-2 (LanWin4)	DC		2,000	N-11.2, N-13.1	TenneT		2031
NOR-13-1 (LanWin5)	DC		2,000	N-12.3, N-13.2	TenneT		2031
NOR-6-4 (BorWin7)	DC		2,000	N-6.8	Amprion		2032
NOR-9-4	DC		2,000	N-9.4	TenneT		2032
NOR-9-5	DC		2,000	N-9.5	Amprion		2033
NOR-12-3	DC		2,000	N-12.4	50Hertz		2033
NOR-12-4	DC		2,000	N-12.5	TenneT		2034
BALTIC SEA							
(Preliminary) Operational							
OST-3-1 (Baltic 1)	AC		51	EnBW Baltic 1	50Hertz	NKT	2011
OST-3-2 (Baltic 2)	AC		288	EnBW Baltic 2	50Hertz	NSW, Silec Cable, NKT	2015
OST-1-1 (Ostwind 1)	AC		250	Wikinger	50Hertz	Prysmian	2018
OST-1-2 (Ostwind 1)	AC		250	Arkona	50Hertz	Prysmian	2019
OST-1-3 (Ostwind 1)	AC		250	Arkona, Wikinger	50Hertz	Prysmian	2019
OST-2-1 (Ostwind 2)	AC		250	Arcadis Ost 1	50Hertz	NKT, Boskalis	2023
Under Construction							
OST-2-2 (Ostwind 2)	AC		250	Baltic Eagle	50Hertz	NKT, Boskalis	2024
OST-2-3 (Ostwind 2)	AC		250	Baltic Eagle	50Hertz	NKT, Boskalis	2024
OST-1-4 (Ostwind 3)	AC		300	Windanker	50Hertz	HSM Offshore Energy, Smulders, Iv-Offshore & Energy, Hellenic Cables	2026
Planned[2]							
OST-6-1 ("Gennaker")	AC		927	Gennaker	50Hertz	HSM Offshore Energy, Smulders, Iv-Offshore & Energy	
OST-2-4 (Ostwind 4)	DC		1,000	O-2.2	50Hertz		2030

BALTIC SEA

Project Name	Area	Grid Connection	Location	Developer/Owner	Turbine Type	Number of OWT	Total Capacity [MW][1]	(Expected) Commissioning	Ø Distance to Shore [km]	Ø Water Depth [m]	Tender Round[6]
Operational (5)											
EnBW Baltic 1	6	OST-3-1 (Baltic1)	12 NM Zone	EnBW and 19 municipal utilities	Siemens SWT-2.3-93	21	48.3	2011	15	18	
EnBW Baltic 2	3	OST-3-2 (Baltic2)	EEZ	EnBW, PGGM and Ärztеversorgung Westphalen-Lippe	Siemens SWT-3.6-120	80	302.4	2015	61	35	
Wikinger	1	OST-1-1 (Ostwind 1), OST-1-3 (Ostwind 1)	EEZ	Iberdrola and Energy Infrastructure Partners	Adwen AD 5-135	70	366.1	2017	78	39	
Arkona	1	OST-1-2 (Ostwind 1), OST-1-3 (Ostwind 1)	EEZ	RWE, Equinor and Energy Infrastructure Partners	Siemens SWT-6.0-154	60	378	2018	71	28	
Arcadis Ost 1	4	OST-2-1 (Ostwind 2)	12 NM Zone	Parkwind	Vestas V174-9.5 MW	27	257.2	2023	54	44	2018
Summary						258	1,352				
Under Construction (1)											
Baltic Eagle	2	OST-2-2 (Ostwind 2), OST-2-3 (Ostwind 2)	EEZ	Iberdrola and Masdar	Vestas V174-9.5 MW	50	476.3	2024	73	43	2018
Awarded in Tender / Grid Connection Claim (3)											
Windanker	1	OST-1-4 (Ostwind 3)	EEZ	Iberdrola		21	300	2026	82	43	2021
Gennaker	6	OST-6-1	12 NM Zone	Skyborn Renewables	Siemens Gamesa SG 167-DD	103	927	2027	15	17	
O-2.2	2	OST-2-4 (Ostwind 4)	EEZ	TotalEnergies			1,000	2030			2023 (not centrally pre-investigated)

MW – Megawatt
OWT – Offshore Wind Turbine
12 NM zone – 12 Nautical Mile Zone (Territorial Sea) is licensed by German Federal States
EEZ – German Exclusive Economic Zone (from 12 to 200 nautical miles off the coast) is licensed by Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrografie, BSH)
TSO – Transmission system operator

FOOTNOTES

[1] An area and a grid connection for the **offshore test field** have been proposed, further details on commissioning etc. have not yet been determined.
[2] The determination of future wind areas and grid connections is based on the expansion targets for offshore wind energy of **30 GW by 2030 and 70 GW by 2045** (WindSeeG 2023). The illustrations are based on the Maritime Spatial Plan 2021 and the preliminary draft of the Site Development Plan 2024 (published in Sep. 2023).
[3] An area for **Other Forms of Energy Generation** has been designated. Details on tendering date and rules have not yet been fully defined.
[4] Developers of permitted projects in territorial seas are entitled to receive a grid connection (EnWG Amendment 2021).
[5] Since 2023, in addition to the **sites centrally pre-investigated** by the BSH, sites **not centrally pre-investigated** are also put out to tender. The tender system differs depending on the site.
[6] The installed capacity of offshore wind farms is not always equal to the assigned grid connection capacity.

For emergency helicopter time estimation only, ship solutions are a comparable rescue option to helicopters

LEGAL NOTICE
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