



# OFFSHORE WIND FARMS IN THE GERMAN NORTH SEA / BALTIC SEA

## NORTH SEA

| No.                                           | Project name                          | Cluster          | Grid Connection                | Location   | Developer/Operator                                                                                                                                          | Turbine Type                                                  | Number of WTG | Total (expected) capacity [MW] | (Expected) Commissioning | Distance to shore [km] | Water depth [m] |
|-----------------------------------------------|---------------------------------------|------------------|--------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------|--------------------------------|--------------------------|------------------------|-----------------|
| Operational (20)                              |                                       |                  |                                |            |                                                                                                                                                             |                                                               |               |                                |                          |                        |                 |
| 4                                             | ENOVA Offshore Ems-Emden alpha ventus | 2                | NOR-2-1 (Alpha Ventus)         | nearshore  | EWE<br>DEZ (E.ON, EWE, Vattenfall)                                                                                                                          | Enercon E-112<br>Repower SM and AREVA Wind M5000-116 Bar.D.50 | 1<br>12       | 4,5<br>60                      | 2004<br>2010             | 0,1<br>56              | 3<br>28         |
| 2                                             | BARD Offshore 1                       | 6                | NOR-6-1 (BoWin1)               | EEZ        | Ocean Breach Energy<br>(Sale to Macquarie announced in August)                                                                                              |                                                               | 80            | 400                            | 2013                     | 101                    | 40              |
| 3                                             | Riffgat                               | 0                | NOR-0-1 (Riffgat)              | 12 NM-Zone | EWE and AREVA                                                                                                                                               | Siemens SWT-3.6-120                                           | 30            | 113,4                          | 2014                     | 22                     | 20-23           |
| 6                                             | Amrumbank West                        | 2                | NOR-4-2 (HelWin2)              | EEZ        | E.ON                                                                                                                                                        | Siemens SWT-3.6-120                                           | 80            | 302,4                          | 2015                     | 57-66                  | 20-24           |
| 7                                             | Borkum Riffgrund 1                    | 2                | NOR-2-2 (DoWin1)               | EEZ        | Ørsted, KIRKBI Invest A/S and William Demant Invest A/S                                                                                                     | Siemens SWT-4.0-120                                           | 78            | 312                            | 2015                     | 34-43                  | 23-28           |
| 19                                            | Butendiek                             | 5                | NOR-5-1 (SyWin1)               | EEZ        | wpd, Marguerite Fund, Siemens Financial Services, Industriens Pension, Pensionskassen Administration (PKA), Caisse des Dépôts, ewz (Utility of Zurich City) | Siemens SWT-3.6-120                                           | 80            | 288                            | 2015                     | 52-58                  | 17-22           |
| 8                                             | DanTysk                               | 5                | NOR-5-1 (SyWin1)               | EEZ        | Vattenfall and Stadtwerke München                                                                                                                           | Siemens SWT-3.6-120                                           | 80            | 288                            | 2015                     | 89-99                  | 21-32           |
| 9                                             | Global Tech 1                         | 8                | NOR-6-1 (BoWin1) <sup>3)</sup> | EEZ        | Stadtwerke München, Ennag AC, Agor International, Exportes Offshore, Nordland, Windrich, FC Wind 1 and 2, GTU I and II                                      | AREVA M5000 116                                               | 80            | 400                            | 2015                     | 64-104                 | 38-39           |
| 10                                            | Meerwind Süd I Ost                    | 4                | NOR-4-1 (HelWin1)              | EEZ        | China Three Gorges Corporation and Windland                                                                                                                 | Siemens SWT-3.6-120                                           | 80            | 288                            | 2015                     | 20-30                  | 22-29           |
| 12                                            | Nordsee Ost                           | 4                | NOR-4-1 (HelWin1)              | EEZ        | Imogy                                                                                                                                                       | Siemens SWT-3.6-120                                           | 48            | 288                            | 2015                     | 31-34                  | 22-26           |
| 13                                            | Trianel Windpark Borkum               | 2                | NOR-2-2 (DoWin1)               | EEZ        | Trianel and 33 municipal utilities                                                                                                                          | AREVA M5000 116                                               | 40            | 200                            | 2015                     | 60-71                  | 26-32           |
| 25                                            | Gode Wind 1                           | 3                | NOR-3-1 (DoWin2)               | EEZ        | Ørsted, Global Infrastructure Partners and The Renewables Infrastructure Group                                                                              | Siemens SWT-6.0-154                                           | 55            | 332,1                          | 2016                     | 32-41                  | 28-33           |
| 26                                            | Gode Wind 2                           | 3                | NOR-3-1 (DoWin2)               | EEZ        | Ørsted, PKA, Industriens Pension, Larernes Pension and Lagernes Pensionskasse                                                                               | Siemens SWT-6.0-154                                           | 42            | 252                            | 2016                     | 38-44                  | 32-34           |
| 30                                            | Nordergründe                          | 0                | NOR-0-2 (Nordergründe)         | 12 NM-Zone | Gothar Lebensversicherung, wpd, John Laing Group plc                                                                                                        | Siemens SWT-3.6-120                                           | 18            | 110,7                          | 2017                     | 16-18                  | 1-10            |
| 32                                            | Nordsee One                           | 3                | NOR-3-1 (DoWin2)               | EEZ        | Nordland Power Inc. And Imogy                                                                                                                               | Siemens SWT-6.0-154                                           | 54            | 332,1                          | 2017                     | 41-49                  | 27-29           |
| 35                                            | Sandbank                              | 5                | NOR-5-1 (SyWin1)               | EEZ        | Vattenfall and Stadtwerke München                                                                                                                           | Siemens SWT-4.0-130                                           | 72            | 288                            | 2017                     | 111-123                | 25-34           |
| 31                                            | Veja Mate                             | 6                | NOR-6-2 (BoWin2)               | EEZ        | Commerz Real, Ingka Group, K&M, wpd Invest and Siemens Financial Services                                                                                   | Siemens SWT-6.0-154                                           | 67            | 400                            | 2017                     | 97-109                 | 39-40           |
| 16                                            | Borkum Riffgrund 2                    | 2                | NOR-2-3 (DoWin3)               | EEZ        | Ørsted and Global Infrastructure Partners                                                                                                                   | Vestas V164-8.0-MW                                            | 56            | 400                            | 2018                     | 50-63                  | 24-28           |
| 29                                            | Merkur Offshore                       | 2                | NOR-2-3 (DoWin3)               | EEZ        | Partners Group, Infralred Capital Partners, DEME, Coriolis (GE Energy Financial Services and ADEME)                                                         | Haliade 150-6.0MW                                             | 66            | 396                            | 2019                     | 48-63                  | 27-33           |
| Summary                                       |                                       |                  |                                |            |                                                                                                                                                             |                                                               | 1,119         | 5,505,2                        |                          |                        |                 |
| Under Construction (4)                        |                                       |                  |                                |            |                                                                                                                                                             |                                                               |               |                                |                          |                        |                 |
| 22                                            | Deutsche Bucht                        | 6                | NOR-6-2 (BoWin2)               | EEZ        | Nordland Power Inc.                                                                                                                                         | Vestas V164-8.4MW                                             | 33            | 268,8                          | 2019                     | 115                    | 40              |
| 15                                            | EnBW Albatros                         | 8                | NOR-6-2 (BoWin2)               | EEZ        | EnBW and Enbridge Inc.                                                                                                                                      | Siemens SWT-7.0-154                                           | 16            | 112                            | 2019                     | 105                    | 40              |
| 24                                            | EnBW Hohe See                         | 8                | NOR-6-1 (BoWin1)               | EEZ        | EnBW and Enbridge Inc.                                                                                                                                      | Siemens SWT-7.0-154                                           | 71            | 497                            | 2019                     | 100                    | 40              |
| 18                                            | Trianel Windpark Borkum II            | 2                | NOR-2-2 (DoWin1)               | EEZ        | EWE, ewz and Fontavis, Trianel and 17 municipal utilities                                                                                                   | Siemens SWT-6.0-154                                           | 32            | 200                            | 2019                     | 64-69                  | 27-33           |
| Awarded in Tender 2017/18 (7)                 |                                       |                  |                                |            |                                                                                                                                                             |                                                               |               |                                |                          |                        |                 |
| 74                                            | Kaskasi                               | 4                | NOR-4-2 (HelWin2)              | EEZ        | Imogy                                                                                                                                                       |                                                               |               | 325                            | 2022                     |                        |                 |
| 27                                            | Gode Wind 3                           | 3                | NOR-3-3 (DoWin6)               | EEZ        | Ørsted                                                                                                                                                      |                                                               |               | 110                            | 2023                     |                        |                 |
| 28                                            | Gode Wind 4                           | 3                | NOR-3-3 (DoWin6)               | EEZ        | Ørsted                                                                                                                                                      |                                                               |               | 131,75                         | 2023                     |                        |                 |
| 17                                            | Borkum Riffgrund West 1               | 1                | NOR-1-1 (DoWin5)               | EEZ        | Ørsted                                                                                                                                                      |                                                               |               | 420                            | 2024                     |                        |                 |
| 47                                            | Borkum Riffgrund West 2               | 1                | NOR-1-1 (DoWin5)               | EEZ        | Ørsted                                                                                                                                                      |                                                               |               | 240                            | 2024                     |                        |                 |
| 81                                            | OWP West                              | 1                | NOR-1-1 (DoWin5)               | EEZ        | Ørsted                                                                                                                                                      |                                                               |               | 240                            | 2024                     |                        |                 |
| 23                                            | EnBW He Dreht                         | 7                | NOR-7-1 (BoWin1)               | EEZ        | EnBW                                                                                                                                                        |                                                               |               | 900                            | 2025                     |                        |                 |
| Areas for Tender 2021-2025 <sup>(4)</sup> (8) |                                       |                  |                                |            |                                                                                                                                                             |                                                               |               |                                |                          |                        |                 |
| N-9.1 <sup>(1)</sup>                          | 3                                     | NOR-3-3 (DoWin6) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 225                            | 2026                     |                        |                 |
| N-7.2                                         | 3                                     | NOR-3-3 (DoWin6) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 375                            | 2026                     |                        |                 |
| N-3.5                                         | 3                                     | NOR-3-3 (DoWin6) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 200                            | 2027                     |                        |                 |
| N-3.6                                         | 3                                     | NOR-3-3 (DoWin6) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 420                            | 2028                     |                        |                 |
| N-4.7                                         | 6                                     | NOR-6-3 (DoWin4) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 630                            | 2029                     |                        |                 |
| N-6.7                                         | 6                                     | NOR-6-3 (DoWin4) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 270                            | 2029                     |                        |                 |
| N-9.1 TF 1 <sup>(1)</sup>                     | 9                                     | NOR-9-1 (BaWin1) | EEZ                            |            |                                                                                                                                                             |                                                               |               | 600                            | 2030                     |                        |                 |

## BALTIC SEA

| No.                                | Project name       | Cluster | Grid Connection     | Location   | Developer/Operator              | Turbine Type        | Number of WTG | Total (expected) capacity [MW] | (Expected) Commissioning | Distance to shore [km] | Water depth [m] |
|------------------------------------|--------------------|---------|---------------------|------------|---------------------------------|---------------------|---------------|--------------------------------|--------------------------|------------------------|-----------------|
| Operational (5)                    |                    |         |                     |            |                                 |                     |               |                                |                          |                        |                 |
| 106                                | Breitung / Rostock |         |                     | nearshore  | WIND-projekt                    | Nordex N90/2500     | 1             | 2,5                            | 2006                     | 0,3                    | 2               |
| 107                                | 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                     | 16                     | 18              |
| 108                                | EnBW Baltic 2      | 3       | OST-3-2 (Baltic2)   | EEZ        | EnBW and Macquarie Capital      | Siemens SWT-3.3-120 | 80            | 288                            | 2015                     | 57-65                  | 23-44           |
| 111                                | Wikinger           | 1       | OST-1-1 (Ostwind 1) | EEZ        | Iberdrola Group                 | Adwen AD 5-135      | 70            | 350                            | 2017                     | 73-82                  | 26-42           |
| 109                                | Arkona             | 1       | OST-1-2 (Ostwind 1) | EEZ        | E.ON and Equinor                | Siemens SWT-6.0-154 | 60            | 384                            | 2018                     | 37-41                  | 22-28           |
| Summary                            |                    |         |                     |            |                                 |                     | 232           | 1.072,8                        |                          |                        |                 |
| Awarded in Tender 2017/18 (3)      |                    |         |                     |            |                                 |                     |               |                                |                          |                        |                 |
| 131                                | Wikinger Süd       | 1       | OST-1-3 (Ostwind 1) | EEZ        | Iberdrola                       |                     | 10            | 2022                           |                          |                        |                 |
| 115                                | Arcadis Ost 1      | 4       | OST-2-1 (Ostwind 2) | 12 NM-Zone | Parkwind                        |                     | 247           | 2023                           |                          |                        |                 |
| 121                                | Baltic Eagle       | 2       | OST-2-2 (Ostwind 2) | EEZ        | Iberdrola                       |                     | 476,25        | 2022/23                        |                          |                        |                 |
| Areas for Tender 2021–2025 (1)     |                    |         |                     |            |                                 |                     |               |                                |                          |                        |                 |
| 0-1.3                              |                    | 1       | OST-1-4             | EEZ        |                                 |                     | 300           | 2026                           |                          |                        |                 |
| Other (3)                          |                    |         |                     |            |                                 |                     |               |                                |                          |                        |                 |
| GICON-SOP <sup>(2)</sup>           |                    | 6       | OST-3-1 (Baltic1)   | 12 NM-Zone | GICON Group                     | Siemens SWT-2.3-93  | 1             | 2,3                            |                          | 21                     | 18              |
| Commissioning <sup>(3)</sup>       |                    | 6       |                     | 12 NM-Zone |                                 |                     | 103           | up to 865 up to 300            |                          |                        |                 |
| Offshore Test Field <sup>(4)</sup> |                    | 7       | OST-7-1             | 12 NM-Zone |                                 |                     |               |                                |                          |                        |                 |

WTG = megawatts, WTG = wind turbine generator, 12 NM zone = 12 nautical mile zone (coastal seas) in Germany licensed by German states  
EEZ = German Exclusive Economic Zone (from 12 to 200 nautical miles from the coast); in Germany licensed by: German Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie, BSH)

### FOOTNOTES

- <sup>(1)</sup> GICON-SOF: Floating Offshore Foundation has been assigned grid capacity but not started construction yet.
- <sup>(2)</sup> Gennaker has been approved by the authority in 2019 but has not been assigned grid capacity yet. The wind farm area has not been chosen for Tender 2021-2025.
- <sup>(3)</sup> An area for an **Offshore Test Field** has been identified by BSH in the Site Development Plan, but not been confirmed yet. A Grid Connection has been identified by TSOs in the Grid Development Plan, but not been confirmed yet.
- <sup>(4)</sup> Several **pre-planned wind farms** (discussed or permitted in the past) could use a **right of subrogation** for the areas in Tender from 2021 to 2025. This applies to *Nordsee Two* in N-3.5, *OWP Delta Nordsee 1* and *OWP Delta Nordsee 2* in N-3.6; *Nordsee Three* in N-3.8, *Atlantis I* in N-6.6, *Global Tech II* in N-7.2, *Wikinger Nord* in 0-1.3 and *Windanker* in 0-1.3.
- Further pre-planned (discussed or permitted in the past) wind farms are located **outside of areas to be tendered from 2021 to 2025**. This affects to *Adlergrund* SOD, *Adlergrund* GAP, *Nördlicher Grund*, *Nördlicher Grund Teil* *Sandbank* and *Östsee*schutz.

## GRID CONNECTIONS

| Project                                | Type | Converter platform | (Expected) Capacity [MW] | Connecting Offshore Wind Farms (number on map) (final without interim)                | TSO     | Contractor(s)               | (Expected) Commissioning |
|----------------------------------------|------|--------------------|--------------------------|---------------------------------------------------------------------------------------|---------|-----------------------------|--------------------------|
| <b>NORTH SEA</b>                       |      |                    |                          |                                                                                       |         |                             |                          |
| <b>(Preliminary) Operational</b>       |      |                    |                          |                                                                                       |         |                             |                          |
| NOR-2-1 (Alpha Ventus)                 | AC   | BoWin alpha        | 62                       | (1) alpha ventus                                                                      | TenneT  | Transpower                  | 2009                     |
| NOR-6-1 (BoWin1)                       | DC   | BoWin alpha        | 400                      | (2) BARD Offshore 1                                                                   | TenneT  | ABB, Transpower             | 2010                     |
| NOR-0-1 (Riffgat)                      | AC   |                    | 113                      | (3) Borkum Riffgat                                                                    | TenneT  | NKT                         | 2014                     |
| NOR-2-2 (DoWin1)                       | DC   | DoWin alpha        | 800                      | (7) Borkum Riffgrund 1, (13) Trianel Windpark Borkum, (18) Trianel Windpark Borkum II | TenneT  | ABB                         | 2015                     |
| NOR-4-1 (HelWin1)                      | DC   | HelWin alpha       | 576                      | (10) Meerwind Süd I Ost, (12) Nordsee Ost                                             | TenneT  | Siemens, Prysmian           | 2015                     |
| NOR-4-2 (HelWin2)                      | DC   | HelWin beta        | 690                      | (6) Amrumbank West, (74) Kaskasi                                                      | TenneT  | Siemens, Prysmian           | 2015                     |
| NOR-5-1 (SyWin1)                       | DC   | SyWin alpha        | 864                      | (19) Butendiek, (8) DanTysk, (35) Sandbank                                            | TenneT  | Siemens, Prysmian           | 2015                     |
| NOR-6-2 (BoWin2)                       | DC   | BoWin beta         | 800                      | (15) EnBW Albatros, (22) Deutsche Bucht, (31) Veja Mate                               | TenneT  | Siemens, Prysmian           | 2015                     |
| NOR-3-1 (DoWin1)                       | DC   | DoWin beta         | 916                      | (25) Gode Wind 1, (26) Gode Wind 2, (32) Nordsee One                                  | TenneT  | ABB                         | 2016                     |
| NOR-0-2 (Nordergründe)                 | AC   |                    | 111                      | (30) Nordergründe                                                                     | TenneT  | ABB                         | 2017                     |
| NOR-2-3 (DoWin3)                       | DC   | DoWin gamma        | 900                      | (16) Borkum Riffgrund 2, (29) Merkur Offshore                                         | TenneT  | Alstom (now GE)             | 2018                     |
| NOR-8-1 (BoWin3)                       | DC   | BoWin gamma        | 900                      | (24) EnBW Hohe See, (9) Global Tech 1 <sup>(1)</sup>                                  | TenneT  | Siemens, Petrofac, Prysmian | 2019                     |
| <b>Under Construction</b>              |      |                    |                          |                                                                                       |         |                             |                          |
| NOR-3-2 (DoWin4)                       | DC   | DoWin kappa        | 900                      | (27) Gode Wind 3, (28) Gode Wind 4, N-3.2, N-3.8                                      | TenneT  | Siemens, Dragados, Nexans   | 2023                     |
| NOR-1-1 (DoWin5)                       | DC   | DoWin epsilon      | 900                      | (17) Borkum Riffgrund West 1, (47) Borkum Riffgrund West 2, (81) OWP West             | TenneT  | Kogel and Albel, ABB        | 2024                     |
| <b>Undergoing licensing procedures</b> |      |                    |                          |                                                                                       |         |                             |                          |
| NOR-7-1 (BoWin5)                       | DC   | BoWin epsilon      | 900                      | (23) EnBW He Dreht                                                                    | TenneT  |                             | 2025                     |
| <b>Confirmed</b>                       |      |                    |                          |                                                                                       |         |                             |                          |
| NOR-7-2 (BoWin6)                       | DC   |                    | 900                      | N-7.2                                                                                 | TenneT  |                             | 2027                     |
| NOR-3-2 (DoWin4)                       | DC   | DoWin delta        | 900                      | N-3.5, N-3.6                                                                          | Amprion |                             | 2028                     |
| NOR-6-3 (BoWin4)                       | DC   | BoWin delta        | 900                      | N-4.6, N-4.7                                                                          | Amprion |                             | 2029                     |
| <b>Identified in FEP and/or NEP</b>    |      |                    |                          |                                                                                       |         |                             |                          |
| NOR-9-1 (BoWin1)                       | DC   |                    | 1,000                    | N-9.1                                                                                 | TenneT  |                             | 2030                     |
| NOR-10-2 (BoWin3)                      | DC   |                    | 1,000                    |                                                                                       | TenneT  |                             | 2030                     |
| NOR-9-2 (BoWin2)                       | DC   |                    | 1,000                    |                                                                                       | Amprion |                             | after 2030               |
| NOR-10-1 (BoWin4)                      | DC   |                    | 1,000                    |                                                                                       | Amprion |                             | after 2030               |
| NOR-12-2 (LoWin2)                      | DC   |                    | 1,200                    |                                                                                       | Amprion |                             | after 2030               |
| NOR-12-1 (LoWin1)                      | DC   |                    | 1,200                    |                                                                                       | TenneT  |                             | 2032                     |
| NOR-11-1 (LoWin3)                      | DC   |                    | 1,100                    |                                                                                       | TenneT  |                             | 2034                     |
| NOR-11-2 (LoWin4)                      | DC   |                    | 1,200                    |                                                                                       | TenneT  |                             | 2035                     |

### BALTIC SEA

|                                        |    |  |     |                                                  |         |               |      |
|----------------------------------------|----|--|-----|--------------------------------------------------|---------|---------------|------|
| <b>(Preliminary) Operational</b>       |    |  |     |                                                  |         |               |      |
| OST-3-1 (Baltic1)                      | AC |  | 51  | (107) EnBW Baltic 1, GICON-SOF                   | 50Hertz | NKT           | 2011 |
| OST-3-2 (Baltic2)                      | AC |  | 288 | (108) EnBW Baltic 2                              | 50Hertz | NSW, NKT      | 2015 |
| OST-1-1 (Ostwind 1)                    | AC |  | 250 | (111) Wikinger                                   | 50Hertz | Prismian      | 2018 |
| OST-1-2 (Ostwind 1)                    | AC |  | 250 | (109) Arkona                                     | 50Hertz | Prismian      | 2019 |
| OST-1-3 (Ostwind 1)                    | AC |  | 250 | (109) Arkona, (111) Wikinger, (131) Wikinger Süd | 50Hertz | Prismian      | 2019 |
| <b>Undergoing licensing procedures</b> |    |  |     |                                                  |         |               |      |
| OST-2-1 (Ostwind 2)                    | AC |  | 250 | (115) Arcadis Ost 1                              | 50Hertz | NKT, Boskalis | 2021 |
| OST-2-2 (Ostwind 2)                    | AC |  | 250 | (121) Baltic Eagle                               | 50Hertz | NKT, Boskalis | 2021 |
| OST-2-3 (Ostwind 2)                    | AC |  | 250 | (121) Baltic Eagle                               | 50Hertz | NKT, Boskalis | 2022 |
| <b>Identified in FEP and/or NEP</b>    |    |  |     |                                                  |         |               |      |
| OST-1-4                                | AC |  | 300 | 0-1.3                                            | 50Hertz |               | 2026 |
| OST-7-1 (north of Warnemünde)          | AC |  | 300 | Offshore Test Field                              | 50Hertz |               | 2029 |

### LEGAL NOTICE

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