

Fact Sheet

BorWin3 grid connection system

Status: February 2020

Siemens turned over the grid connection system for the BorWin3 offshore platform to the customer TenneT in February 2020. The connection has thus gone into commercial operation. BorWin3 is one of six North Sea grid connections for which Siemens was contracted by the German-Dutch network operator TenneT. These links will have a total transmission capacity of more than 4.7 gigawatts. High-voltage direct-current (HVDC) transmission technology is used to ensure efficient transfer of the electrical energy to land: The alternating current that is produced is converted to direct current power at the HVDC platform. This is necessary to transport energy across great distances with only minimal losses. The electricity produced in the wind farms is transported to the German mainland via a subsea cable. Thanks to HVDC technology, transmission losses are less than four percent. The direct current power is then converted back into alternating current at a second converter station on land and fed into the German power grid.

Technical data, platform:

- Capacity: 900 megawatts – enough to supply more than one million households
- Voltage: Input: 155 kV (AC); HVDC link: +/- 320 kV (DC); network connection Emden: 380 kV (AC)
- HVDC transformers: 2 offshore, each with a rating of 671 MVA, 2 onshore, each at 666 MVA
- Dimensions (without mountings): platform/topside: 71 m x 71 m x 34 m (length x width x height), jacket/base frame: 65 m x 57 m x 60 m (length x width x height)



- Construction: 7 decks incl. upper deck– total height 34 m netto / 47 m (incl. cranes)
- Crew quarters: 16 cabins with individual bathroom and a total of 24 bunks, 1 galley with a total of 3 walk-in refrigerated compartments, 1 multi-purpose/recreation room, 2 lounges
- Heliport: 1 elevated helipad
- Local sea depth: 40 meters
- Bottom of platform: 20 meters above the surface of the sea
- Loading cranes: 2 on upper deck, each with 10 tons of load-carrying capacity at 42 m extension range
- Total weight: 30,000 tons (18,000 t platform / 7,000 t base frame, 5,000 t steel-piling supports)
- DC submarine cable: 2 cables with steel wire reinforcement (Prysmian), each 160 km long (130 km in sea, 30 km on land)
 - Sea area: approx. 13 cm cable diameter, weight of around 40 kg/m conductor cross-section of 1,300 mm²
 - Watten Sea area: approx. 14 cm cable diameter, weight of around 50 kg/m, conductor cross-section of 1,800 mm²
 - Land area: approx. 12 cm cable diameter, weight of around 15 kg/m, conductor cross-section of 2,500 mm²
- Foundation: 6 main pilings (up to 110 m long, embedded up to 55 m in the seabed) and four additional pilings (up to 85 m long, embedded up to 57 m in the seabed)
- Cooling: Seawater cooling with heat exchanger for the fresh-water cooling system 1,729 cubic meters/h flow rate
- Shipyard: Dubai Drydocks World
- Order received: April 2014
- Consortium partner: Petrofac International (UAE) LLC.
- Platform installation: October 2018
- Commissioning: February 2020



Technical data, onshore converter station

- Location: Emden/East
- Total area of plant: 180 m x 155 m = 27,900 m²
- Deep foundation: 1,140 posts between 18 meters and 22 meters long
- Soil moved for excavation pits: approx. 14,000 m² removed
- Total length of installed concrete: approx. 5,000 m²
- Total length of installed structural steel: approx. 850 t
- Copper cable installed for grounding: approx. 15,000 m²
- Cable laid: approx. 32,000 m²
- Installed high-voltage cable: approx. 3,000 m
- Converter building:
 - Dimensions (LxWxH): 106 m x 42 m x 17.6 m (ridge height)
 - Footprint: 4,452 m²
 - Reconstructed space: 73,500 m²
 - Floor slab: 2.700 m² concrete cast in one piece (30 h)
- Transformer transport: with a 100 m vehicle