Germany is home to Europe’s biggest wind energy market. New offshore wind turbines with a capacity of 1,250 megawatts went online in 2017. Offshore wind-generated energy has also consolidated its position in the German power mix, with expansion in recent years making a record 18 terawatt-hours possible in 2017. Germany’s ports provide the optimal mix of location and infrastructure for offshore wind actors.

Record Offshore Growth

Germany remained the largest wind energy market in Europe in 2017, with 6.6 gigawatts installed capacity representing a record year. Offshore wind energy reached a cumulative capacity of 5.4 gigawatts in the same year. The amount of power generated by offshore wind turbines was around 18 terawatt-hours. This consolidates offshore wind power’s position in the German power mix, supplying over four million households with electricity. Germany is in a period of transition from the old support scheme to a competitive tendering-based scheme. While market participants adapt to the new system, installation numbers are expected to be slightly lower with a recovery expected in 2019/2020.

Attractive German Market

The German offshore industry will be an attractive field of investment for years to come. The German government has set an objective of the implementation of 6.5 gigawatts of offshore wind energy capacity by 2020. The 2017 end-of-year maximum legally assigned grid connection capacity is 7.7 gigawatts for projects implemented by 2020. Around 85 percent of the capacity assigned for grid connection capacity is in implementation. Grid connection capacities totaling around 0.2 gigawatts have been assigned to other projects that can now be financed and implemented. Projects that failed to secure a grid connection confirmation must participate in tender proceedings to obtain a confirmation. The government has set a development target of 15 gigawatts for 2030.

Growing European Market

It is not just ambitious German projects that will trigger investments in this sector: A number of neighboring countries have ambitious targets and the UK, the market with the highest total capacity, also has plans to continuously increase capacity levels. Europe’s cumulative installed offshore wind capacity (across a total of 4,149 wind turbines) reached 15,780 megawatts at the end of 2017. There are now 92 offshore wind farms in 11 European countries including sites with partial grid-connection. Six projects worth EUR 7.5 billion reached final investment decision (FID) in the same year. This represents 2.5 gigawatts of new capacity. By 2020, offshore wind is projected to grow to a total installed capacity of 25 gigawatts. Offshore wind industry companies based in Germany enjoy a strategic advantage of being able to cater to both German and other European offshore wind farm projects, many of which are located near the German coastline.

German Offshore Wind Capacity 2017

in gigawatts

<table>
<thead>
<tr>
<th>Capacity tendered in 2018</th>
<th>5.4</th>
<th>OWTS (with grid connection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assigned through tender process</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Fixed investment decision (FID)</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>under construction</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Forecast offshore wind expansion capacity by 2025</td>
<td>10.8 GW</td>
<td></td>
</tr>
</tbody>
</table>

Source: WindGuard 2018
Offshore Infrastructure

Germany’s ports along the coasts of the Baltic and North Seas are ideally situated to meet the requirements of the heavy offshore industry as well as the related service industry. European Union and federal state level authorities and private companies alike have invested in port infrastructure such as terminals, quayside production sites and heavy load quays. German port infrastructure covers all important functions to perfectly cater to wind farms across Europe. Here we list Germany’s most important offshore manufacturing ports along the coastlines.

1. **Emden**
   Germany’s most westerly seaport lies favorably located to the offshore wind parks in the North Sea and is an efficient production, assembly, logistics and distribution center for both onshore and offshore wind power system components. The location has considerable experience as a wind energy hub and provides manufacturers and suppliers excellent perspectives through large development space potential and numerous competent service providers.
   - Depth of up to 11.9 m, suitable for jack-up
   - Long-term wind energy logistics experience
   - Comprehensive offshore services

2. **Wilhelmshaven**
   Wilhelmshaven is continuously used for offshore projects; be it for temporary storage, pre-assembly of plant components or, more particularly, the retrofitting and equipping of jack-up vessels, cable ships and supply unit services. Complete rotor stars are produced at the deepwater harbor. The inner harbor behind the double lock provides quays (approximately 1,600 meters in length) and competent specialist companies catering for the entire range of services (including offshore wind energy companies and port logistics service providers).
   - Water depths: 18 m to 22 m in deepwater port, up to 12 m in inner harbor
   - Site spaces behind the quays available
   - Helicopter services at JadeWeserAirport

3. **Stade**
   The seaport of Stade is conveniently located between Hamburg and the river Elbe estuary near the Kiel Canal. A number of companies provide all of the necessary port services and heavy-duty infrastructure at the site. One of the location’s industrial focal points is the production of epoxy resins, rotor blades and large cast parts up to 100 tons in size for the offshore wind energy sector.
   - Development potential at deepwater sites
   - Depth of up to 9.5 m, heavy load quays
   - Innovative strength provided by powerful industry cluster with significant R&D capabilities

4. **Nordenham**
   In Nordenham, numerous companies are involved in offshore wind industry development, production, supply, logistics, assembly, and maintenance. Nordenham has established itself as an important sea cable and foundation production and logistics location. Heavy load-bearing quay facilities, specialized port service providers and available development space characterize the port location on the river Weser.
   - Industry areas and halls for production and final assembly
   - High undersea cable logistics competence
   - Depth of up to 13.1 m, high-performance crane equipment

5. **Bremerhaven**
   The ports of Bremerhaven provide a variety of quays and terminals suited to the different needs for manufacturing, construction and service. Heavy load areas offer ideal conditions for the manufacturing of components such as nacelles, rotor blades, towers and foundations; sophisticated logistic services support handling and shipping.
   - 3 terminals, 2,500 m berth length, 6-7 moorings, water depth of up to 15.5 m
   - Jack-up directly in front of heavy load platforms
   - Logistics area of 50 ha directly at quayside, more than 270 ha industrial sites nearby
Hamburg

The offshore wind hub Hamburg is located between the North Sea and the Baltic Sea, with excellent connections to important offshore wind ports. Hamburg is a leading city for offshore wind project development and is home to various international headquarters of service providers and manufacturers. Legal services are well represented in Hamburg, with a large number of solicitors specialized in the complex legal technicalities of offshore wind energy development. The city also hosts most of the relevant certification bodies as well as a diverse R&D landscape.

Hamburg is also host to the wind power industry’s leading international trade fair. “WindEnergy Hamburg” is held every other year in close cooperation with Husum in Schleswig-Holstein. With more than 180 member companies, the “Renewable Energy Hamburg” local cluster initiative strengthens the development of the offshore wind industry in Hamburg and helps create business opportunities.

Bremen

Situated directly on the North Sea coast and internationally connected – that’s the state of Bremen with its port city of Bremerhaven. Thanks to its maritime and port-logistics tradition, Bremen is an ideal location for offshore wind company headquarters and subsidiary operations. Around 120 companies and a five thousand-strong workforce along the entire value chain build upon the short routes to all offshore ports along the North Sea coast and into the European inland by sea, highway, rail, and air. As well as being home to leading industry players (including Adwen, Senvion, wpd, and Reetec), Bremen is also a major site of scientific excellence. Notable addresses include the rotor blade test center and nacelle testing lab at the Fraunhofer Institute for Wind Energy and Energy System Technology in Bremerhaven and the ForWind Center for Wind Energy Research in Bremen. WAB – the Wind Energy Agency, with more than 350 members, is also located in the state of Bremen.
Cuxhaven
With its German-Offshore-Industry-Center, Cuxhaven is a leading location for wind power system production, assembly and logistics services for the wind industry. The universal port provides ideal conditions for companies including Siemens and Ambau and their respective suppliers. Situated in a central location to the offshore wind farms in the North Sea, Cuxhaven provides access to high-performance and heavy-load capable infrastructure and superstructure with available commercial sites.

- 2,400 m berth length, depth of up to 16 m, jack-up capable mooring berths
- Offshore helicopter base at Sea Airport Cuxhaven/Nordholz

Elbhafen Brunsbüttel
With its advantageous location at the lower Elbe and the Kiel Canal, Brunsbüttel provides direct access to the North and Baltic Seas, close proximity to Hamburg, a connection to the European inland waterways as well as available industry spaces next to the port. Elbhafen Brunsbüttel is a highly flexible universal port with access to a trimodal terminal-connection, with optimal transport links for trucks, trains, seagoing as well as inland waterway vessels. Large components for onshore wind energy turbines that are handled and temporarily stored at Elbhafen Brunsbüttel represent an important goods segment. Brunsbüttel Ports GmbH is the owner and operator of the Elbhafen Brunsbüttel.

- Almost 1,100 m berth length, depth of up to 14.6 m
- Heavy load quay and buffer zone for components
- Available industry sites close to port

Rendsburg Port
The heavy goods port provides ideal conditions for companies in the wind energy sector and manufacturers of heavy machinery and equipment. Connections to all important transport routes are provided thanks to its central location on the Kiel Canal. The port serves as a link between the ports of the North and Baltic Seas as well as those of Scandinavia and the European Union. A number of high-tech companies – including Senvion and Max Bögl – located in the immediate vicinity benefit from the exceptional location advantages provided by the port.

- 3.6 ha ISPS-certified terminal space, heavy load area with up to 90 t/m² load capacity
- 2 mobile harbor cranes with 250 t load capacity
- 50 ha business park with heavy-load capable connection within immediate vicinity of port

Rostock
The city of Rostock is a center of the wind industry for on- and offshore projects. Companies including Nordex, Suzlon, Liebherr-MCCtec, EEW, and Deutsche Großwälzlager are engaged in the design, production and distribution of wind turbines, monopiles, heavy lift cranes, and offshore transformer platforms. The port of Rostock provides the required infra- and suprastructure for the wind and offshore industry.

- Maximum area load 25t/m²; maximum water depth 14.5 m; handling technologies: RoRo, LoLo; jack-up possibilities
- Specialized service providers
- Industrial sites close to quay

Sassnitz
With the construction of a completely new port area for the operation of offshore wind farms and related maintenance services, the port Sassnitz Mukran is currently being transformed from a typical installation port to a location where a wide range of services can be sited for a period of more than 25 years.

- 2 terminals, 1,260 m berth length, draught of up to 12.5 m
- Jack-up directly in front of heavy load quay, lifting capacity of up to 50 t/m²
- Logistics area of 22 ha direct at quayside, 7 ha industrial sites near the quays
Our Services

Investment Project Location Services

Touring German Offshore Ports

Germany is the major force driving growth in Europe’s offshore wind industry. The country’s offshore sector continues to expand, with optimized turbine technology, operating concepts and project volume developments all contributing to bring down costs. Comprehensive industry value chain coverage presents a number of attractive market opportunities for international investors. Germany’s coasts offer a large number of outstanding port locations for the offshore wind energy industry.

Germany Trade & Invest (GTAI) organizes regular North Sea and Baltic Sea tours to showcase the offshore wind opportunities available to international investors. Tours are conducted according to the individual requirements of participating companies, and vary in terms of length and locations visited respectively. Two offshore tours of ports that are particularly suited to production and centrally located for management and sales functions are provided here by way of example.

North Sea Tour Example:
The starting point is Hamburg, the German offshore wind project development hub. Ports to be visited along the North Sea coastline include Bremen and Bremerhaven, Emden, Cuxhaven, and Brunsbüttel.

Baltic Sea Tour Example:
Starting point is Hamburg. From here the tour heads to the Baltic Sea coast, where wind hub locations including Rostock and Sassnitz await participants.

Meet:
- port operators
- local supply industry
- regulatory authorities
- local business

Visit:
- local infrastructure
- potential sites for your business
- potential supply industry facilities
- port facilities

As well as investment project location services, GTAI also provides a range of individual investment services to international investors. Contact us for information on our next site visit tour or make an appointment for our consultation services.

renewables@gtai.com
About Us

Germany Trade & Invest (GTAI) is the foreign trade and inward investment agency of the Federal Republic of Germany. The organization advises and supports foreign companies planning to expand into the German market and assists German companies seeking to enter foreign markets.

Investment Location Germany
GTAI provides close-to-market information to international companies looking to enter German markets. Our specialist industry teams prepare all of the relevant information essential to business success in Germany. GTAI’s comprehensive range of information services includes:

- Market and industry reports
- Market entry analyses
- Business and tax law information
- Business and labor law information
- Funding and financing information

Business Location Services
GTAI supports international companies from market entry to business start-up in Germany. Expert project teams advise and assist in the business establishment phase. GTAI’s range of free services includes:

- Legal and tax-related project support
- Funding and financing advisory services
- Site visit organization
- Local partner and network matchmaking
- Public and private partner coordination

All investment-related services are provided entirely free of charge. Our specialist industry teams have hands-on experience in their respective industries and treat all investor enquiries with the utmost confidentiality.

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