

The background image shows a large red ship, the Fred Olsen Windcarrier, docked at a port. The ship is carrying several large white wind turbine components. In the background, several wind turbines are visible on the shore. The ship's name "Fred Olsen Windcarrier" is visible on its side.

FOLLOW THE ENERGY

EEMSHAVEN: MAIN HUB IN OFFSHORE WIND INDUSTRY



EEMSHAVEN MEETS MARITIME REQUIREMENTS OFFSHORE WIND INDUSTRY

- Draught: 7,5 - 14 m.
- Quay length: 5,085 m. (private and public quays)
- Jetty length: 1,130 m
- Width of fairway and basin(s): 110 - 350 m.
- Wide port entrance: suitable to transport assembled three-bladed rotors
- No infrastructural restrictions sail in/out of large material (power lines, bridges, locks, etc.)
- Near quay jacking
- Heavy load quays; 30 tons/m² | 20 tons/m² | 10 tons/m²
- Limited tidal range (2.5 m.)
- Approx. 75 hectares offshore sites available

GOALS | PLANNING UP TO 2050

GOALS 2030:

Netherlands (west coast):	± 11.5 GW
Germany (German Bight North Sea):	± 20 GW
United Kingdom	± 40 GW

GOALS 2050:

Netherlands (west & northern coast):	± 20-40 GW
Germany (German Bight North Sea):	± 40 GW
United Kingdom:	± 75 GW

FOLLOW THE ENERGY

Around a third of all the energy that is produced in the Netherlands comes from Eemshaven. With an installed capacity of 8,000 MW Eemshaven is known as an energy port. Major energy producers have invested billions of Euros in new power stations; an oil terminal was built; Google is expanding its immense data centre; and Eemshaven houses the largest onshore wind farm in the Netherlands. The port also plays a prominent role in the development of wind farms at sea during their construction and the subsequent maintenance of the wind turbines. Eemshaven lives and breathes offshore wind and has become one of the leading ports in the offshore wind industry around the North Sea. In 2020/2021 transport and installation work of 165 monopiles and 165 transition pieces took place for the world's largest offshore wind farm: Hornsea Two (UK). Next to that a consortium of Equinor, Gasunie, Groningen Seaports, RWE and Shell Nederland launched the NorthH2 project: the production of green hydrogen using renewable electricity generated by major wind farms in the North Sea, gradually be up-scaled to a capacity of more than 10 gigawatts. Eemshaven has a prominent role in this project and its position as offshore wind port is further strengthened by the arrival of the Offshore Wind Innovation Centre (OWIC).

IMPRESSIVE TRACK RECORD

Since 2009 Eemshaven plays an important role regarding assembly and shipping activities of wind turbines, which results in an impressive track record of wind farms launched from Eemshaven: successively Alpha Ventus, Bard Offshore I, Borkum Riffgat, Borkum Riffgrund I, Trianel Windpark Borkum, Global Tech I, Gemini, Gode Wind I & II, Veja Mate, Race Bank (UK), Nordsee One, Borkum Riffgrund II, Merkur Offshore, Hohe See, Albartros, Trianel Windpark Borkum II and Hornsea Two. Currently Kaskasi is launched from Eemshaven. In the near future many offshore wind projects are planned in which Eemshaven could fit as base or service port.

PLUG IN

Follow the energy and plug into your opportunities in Eemshaven. Contractors, construction companies, service and maintenance companies in the offshore wind industry, please contact our business manager below.



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LOGISTICS:

- 17 projects
- 6.9 GW (of which 2.2 GW turbines and 4.7 GW foundations)
- 1,185 turbines

OPERATION & MAINTENANCE (O&M):

- 6 windfarms
- 2.5 GW
- 474 turbines

OFFSHORE SHIPPING MOVEMENTS (2020):

- | | |
|---|-----|
| • Work ships: | 48 |
| • Service Offshore Vessels (SOV's)/Jack-ups: | 328 |
| • Crew Transfer Vessels (CTV's)/Supply vessels: | 718 |



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EEMSHAVEN: MAIN HUB IN OFFSHORE WIND INDUSTRY

EXCELLENT SITUATED AND MANY FACILITIES

Eemshaven lives and breathes offshore wind. The port has become one of the leading ports in the offshore wind industry around the North Sea. Eemshaven is excellently situated, close to the North Sea, and well-equipped to accommodate logistic (offshore) projects. Many facilities are available in Eemshaven, like business sites, service locations, storage possibilities, (heavy load) quays, jetties, a heliport, office space, etc. which makes this port excellent suitable as base or service port. The distance to the wind farms (under construction, planned or completed) is short.

TRACK RECORD

Eemshaven has an impressive track record of wind farms launched: successively **Alpha Ventus, Bard Offshore I, Borkum Riffgat, Borkum Riffgrund I, Trianel Windpark Borkum, Global Tech I, Gemini, Gode Wind I & II, Veja Mate, Race Bank, Nordsee One, Merkur Offshore, Borkum Riffgrund II, Hohe See, Albatros, Trianel Windpark Borkum II** and **Hornsea Two**. Eemshaven is also in use for operation and maintenance activities. Currently the wind farms Gemini (Siemens Gamesa), Veja Mate (Siemens Gamesa), Merkur Offshore (General Electric - GE) and Deutsche Bucht (Vestas) have their O&M service base in Eemshaven. Also Global Tech I and BARD Offshore are maintained and/or repowered from Eemshaven.

DIRECT ACCESS TO THE NORTH SEA

Due to the uncongested roads and ports, and efficient logistics there are hardly any waiting times in the Eemshaven. Eemshaven is multimodal attainable and has direct access to the North Sea. The port basins are wide and there are no sealocks or bridges, which makes it possible to pre-assemble the rotor blades and the nacelle in Eemshaven and transship the complete rotor star to the concerned wind farm. Furthermore Eemshaven has a heliport, a train station and an airport is in the vicinity.

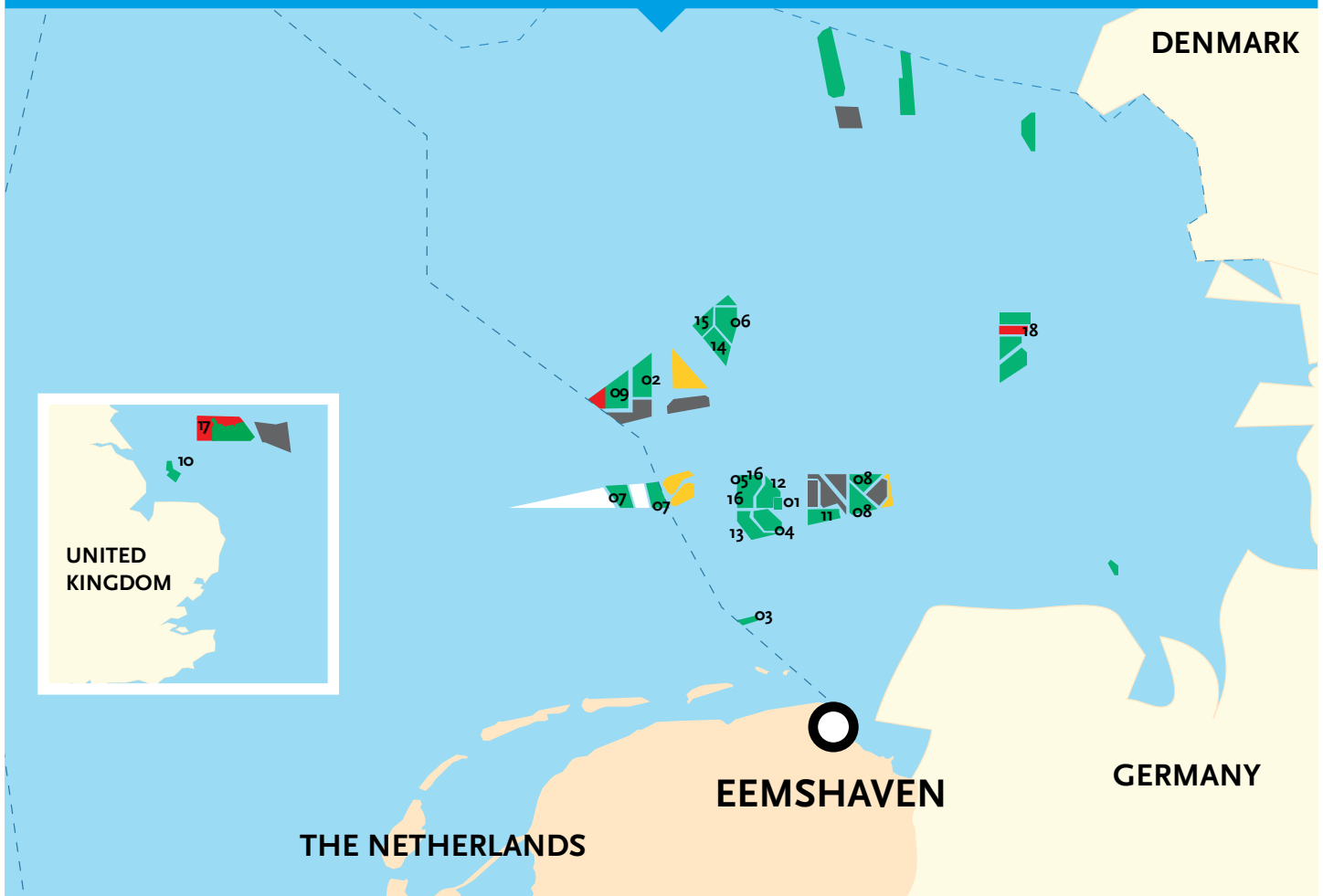
SERVICE PORT

Both Eemshaven and Beatrixhaven are suitable for service and maintenance activities regarding the offshore wind business. There are sufficient berthing places for service operation vessels, cable layers and other offshore support vessels and it is possible to embark passengers. Besides that, plenty of storage areas are available: paved or unpaved, outside and/or in warehouses. Furthermore, several sites for permanent use are available around the Emma- or Beatrixhaven and can be bought or leased. It is also possible to rent existing locations or make use of existing facilities.

**“EEMSHAVEN: ONE OF THE LEADING PORTS IN THE
OFFSHORE WIND INDUSTRY AROUND THE NORTH SEA”**

GENERAL SETTINGS EEMSHAVEN

- Within nautical range of planned windfarms (low costs)
- Direct access to the North Sea
- Competitive lease prices
- Multimodal accessibility (road, rail, water, air)
- Presence of a heliport; close to airport
- Approx. 75 hectares offshore sites available
- Sufficient paved/unpaved storage area available (also adjacent to quay)
- Heavy cargo storage areas available
- Impressive track record (*see pages 14/15 and below*)
- Specialized stevedoring companies available (*see page 12*)
- Specialized offshore service companies available (*see page 12*)
- Heavy load quays (30 tons/m², 20 tons/m² and 10 tons/m² available)
- Extra widened bends to transport rotor blades



Offshore wind farms launched from Eemshaven

- 01 ALPHA VENTUS
12 TURBINES | 60 MW | 28 MILES TO EEMSHAVEN
- 02 BARD OFFSHORE I
80 TURBINES | 400 MW | 43 MILES TO EEMSHAVEN
- 03 BORKUM RIFFGAT
30 TURBINES | 108 MW | 21 MILES TO EEMSHAVEN
- 04 BORKUM RIFFGRUND I
78 TURBINES | 312 MW | 28 MILES TO EEMSHAVEN
- 05 TRIANEL WINDPARK BORKUM I
40 TURBINES | 200 MW | 35 MILES TO EEMSHAVEN
- 06 GLOBAL TECH I
80 TURBINES | 400 MW | 54 MILES TO EEMSHAVEN
- 07 GEMINI
150 TURBINES | 600 MW | 30 MILES TO EEMSHAVEN
- 08 GODE WIND I EN II
97 TURBINES | 582 MW | 40 MILES TO EEMSHAVEN
- 09 VEJA MATE
67 TURBINES | 402 MW | 43 MILES TO EEMSHAVEN

- 10 RACE BANK
91 TURBINES | 580 MW | 265 MILES TO EEMSHAVEN
- 11 NORDSEE ONE
54 TURBINES | 332 MW | 28 MILES TO EEMSHAVEN
- 12 MERKUR OFFSHORE
66 TURBINES | 396 MW | 35 MILES TO EEMSHAVEN
- 13 BORKUM RIFFGRUND II
56 TURBINES | 450 MW | 28 MILES TO EEMSHAVEN
- 14 HOHE SEE
71 TURBINES | 497 MW | 50 MILES TO EEMSHAVEN
- 15 ALBATROS
16 TURBINES | 112 MW | 54 MILES TO EEMSHAVEN
- 16 TRIANEL WINDPARK BORKUM II
32 TURBINES | 203 MW | 35 MILES TO EEMSHAVEN
- 17 HORNSEA TWO
165 TURBINES | 1,320 MW | 248 MILES TO EEMSHAVEN
- 18 KASKASI
38 TURBINES | 342 MW | 87 MILES TO EEMSHAVEN

- IN USE
- UNDER CONSTRUCTION
- APPROVED
- REQUESTED
- IN CONCEPT

EEMSHAVEN: SERVICE PORT FOR MAINTENANCE ACTIVITIES

The profile of Eemshaven answers to be a service port for activities regarding the operations and maintenance (O&M) of offshore wind turbines. Both Emmahaven and Beatrixhaven are suitable to accommodate these kind of activities. There are sufficient berthing places for service operation vessels, cable layers and other offshore support vessels and it is possible to embark passengers. With connections for power supply and fresh water, storage possibilities, office space, customs clearance, and the presence of several logistic providers Eemshaven meets all requirements to accommodate maintenance and service companies.

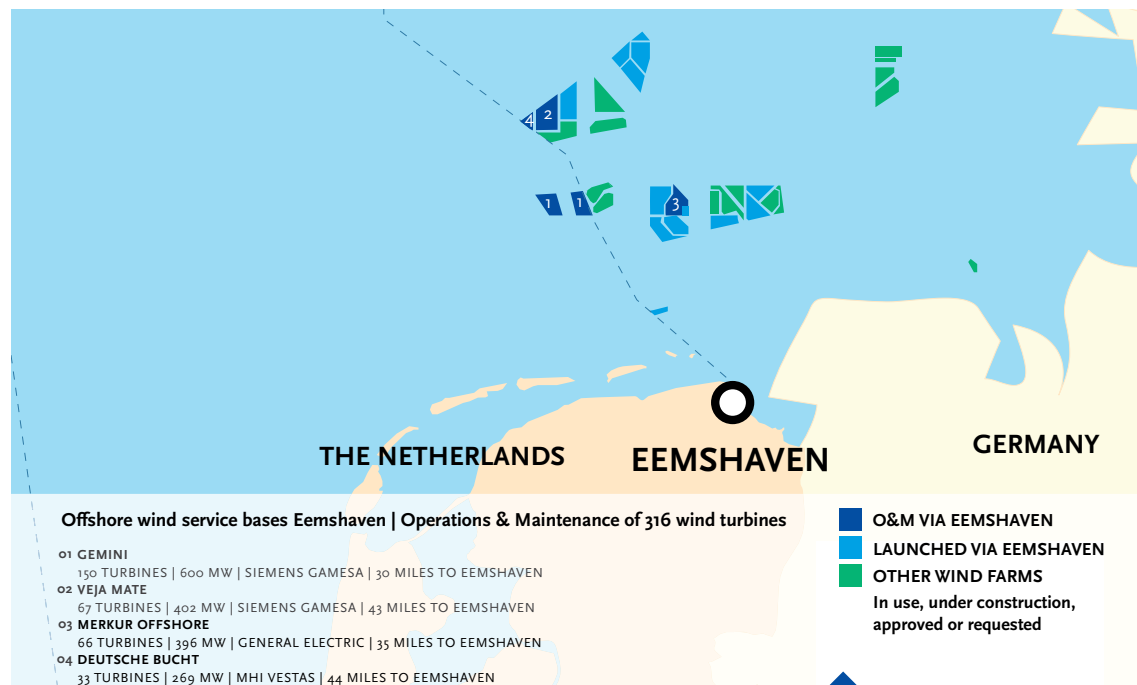


EMMAHAVEN

Emmahaven is 500 metres long with a width of 120 to 150 metres, and a depth of 9.0 metres. A floating jetty and a services jetty provide more than 700 metres of berthing places for small and medium sized vessels. At the northern part of the Emmahaven Sealane operates a quay of 220 metres for general and/or dedicated cargo. At the western part Amasus has a jetty with a capacity of 130 metres and Gulf Bunkering operates a bunker terminal and supplies various high-quality fuels and lubricants for all oceangoing and inland vessels.

BEATRIXHAVEN

Beatrixhaven is 1,200 metres long with a width of 110 to 150 metres, and a depth of 9.0 metres. At the northern part AG EMS operates a ferry terminal and EMS Maritime Offshore (EMO) runs an offshore service facility. EMO provides direct access to the water via a jetty with a capacity of 300 metres and offers lots of space for different configuration options. EMO is also the offshore service base for Siemens Gamesa (Gemini, Veja Mate) and General Electric (Merkur Offshore) and the operator of Heliport Eemshaven. At the southern part stevedoring company Wijnne Barends operates a terminal and accommodates the Norwegian company Seaway Offshore Cables. Bek & Verburg, a specialist in waste collection and segregation, and DHSS, a vessel agency and port service provider, together construct a new offshore service base behind the southern quay as well. Vestas uses the DHSS Facility as O&M base for the 269 MW Deutsche Bucht wind farm.



FOR SALE/LEASE MOORING FACILITIES, OFFICES, STORAGE, BUSINESS SITES

FOR RENT (THIRD) PARTIES

1. EMS Maritime Offshore (storage + jetty)
2. Wijnne Barends (storage + quay)
3. Buss Terminal Eemshaven (storage + quay)
4. DHSS (storage + quay)
5. Wagenborg (storage + quay)
6. Sealane (storage + quay)
7. Amasus Shipping (storage + jetty)
8. Gulf (bunkering)
9. Nijlicht (offices)
10. Services jetty (mooring facility)
11. Floating jetty (mooring facility)
12. Business sites (buy or lease)
13. BOW Terminal (storage + quay)

FACTS & FIGURES

EEMSHAVEN

- Close to wind parks being build (low costs)
- Multimodal accessibility
- Draught Beatrixhaven: 7.5 m
- Draught Emmahaven: 7.5 m
- Jetty capacity: 1,130 m
- Warehouses available; offices available
- Storage space outside
- Connection for power and water
- Heavy mobile cranes
- Fuel bunkering
- Electricity (220 VAC and 380 VAC)
- Grey water disposal
- Water

BEATRIXHAVEN: DEDICATED FOR OFFSHORE WIND FACILITY

HEAVY LOAD QUAY; 30 TONS/M² | NEAR QUAY JACKING



Groningen Seaports has examined the logistic possibilities of the Beatrixhaven for offshore construction and transshipment vessels like jack-ups, pontoons and freighters with large cranes. Simulations demonstrated that most offshore vessels can approach this basin without problems in wind conditions mounting 8 Bft.



BEATRIXHAVEN

Beatrixhaven is the Eemshaven's youngest harbour basin. With the completion of the Beatrixhaven Eemshaven has strengthened its position as base and service port in the offshore wind industry. A special quay with a length of 220 metres has been built for extra heavy cargoes on the western side. This heavy load quay has a maximum capacity (equally divided load) of 30 tons/m² and has been especially designed for the transshipment of extra-heavy cargoes such as wind turbine components. Jack-up ships can moor just in front of the quay. IHC IQIP e.g. used this quay to build up its 1,300 tons Noise Mitigation Systems (NMS) for mono-pile installation. The Beatrixhaven has a length of 1,200 metres and a turning basin has been put in place at the end. On the southern side a 1,200 metres long quay is available with space for companies to establish their businesses.

NEAR QUAY JACKING BEATRIXHAVEN

Jack-up vessels can moor in the Beatrixhaven just in front of the quay. That means these vessels can use their own cranes for loading activities.

ALLREADY ESTABLISHED

On the southern side the stevedoring company Wijnne Barends, that stores, transships and handles a broad range of cargo, has been established. It also accommodates the offshore service company Seaway Offshore Cables. Bek & Verburg, a specialist in waste collection and segregation, and DHSS, a vessel agency and port service provider, have constructed an offshore service base behind the southern quay as well. DHSS accommodates Vestas for the O&M of wind farm Deutsche Bucht (33 turbines). On the northern side AG EMS operates a passenger terminal with a ferry service to the German Wadden island of Borkum. Besides this terminal EMS Maritime Offshore (EMO) runs an offshore service facility with a jetty to accommodate service operations vessels. Siemens Gamesa and Merkur Offshore (General Electric) have offshore servicehubs on the EMO premises to operate and maintain 283 wind turbine generators for Gemini, Veja Mate and Merkur Offshore.

AVAILABILITY OF LAND

Sites for permanent use can be bought or leased. It is possible to build a private terminal behind the quay or to rent existing locations or make use of existing facilities. With over 75 hectares there is enough space for establishment.

FOR SALE APPROX. 75 HECTARES OFFSHORE SITES IN EEMSHAVEN



BUSINESS SITES • (HEAVY CARGO) QUAYS • MOORING FACILITIES FOR JACK-UP VESSELS

HELIPORT EEMSHAVEN

Heliport Eemshaven is certified as international heliport and thus is the ideal gateway for transport and supply flights to offshore projects in the Exclusive Economic Zone in the North Sea. The infrastructure, including a take-off and landing area, is located in the north-western part of Eemshaven, close to the Borkum ferry service of AG EMS Borkumlijn. The total site covers an area of approximately 4.5 hectares, of which approximately 1.35 hectares is airfield. As well as a helicopter landing area, the site contains helicopter parking stands, an administration office and a fuel station. Heliport Eemshaven is operated by Ems Maritime Offshore (EMO). Owner of the infrastructure is Groningen Seaports.

It is necessary to use helicopters in addition to ships for the transport of personnel and tools because of the large distances to e.g. offshore wind farms. With the realisation of the heliport, Eemshaven is strengthening its strong position as a base and service port for the offshore industry. Please visit www.heliport-eemshaven.nl or contact heliport@offshoreservice.de by mail.



Heliport Eemshaven



Location heliport



OFFSHORE WIND TEST TURBINES EEMSHAVEN

Siemens Gamesa (former Senvion), 2-B Energy and Lagerwey/Enercon have test turbines in Eemshaven. Siemens Gamesa hosts two 6MW test turbines on the Wagenborg Stevedoring premises. Both turbines are 114 m high and are part of the Westereems wind farm of RWE Innogy. The 6MW 2-B Energy test turbine is carefully designed and integrated in an overall plant view that reaches substantial cost of energy savings over plant life. The 2-B Power Plant is a true offshore design, setting new standards and targets. It is a two bladed design, with a total length of 140 m. The turbine is 105 m high and offers access for helicopters. By having the two Lagerwey/Enercon 4.5 MW turbines, Eemshaven houses the tallest wind turbines in the Netherlands. These turbines, with a tip height of 200 metres, were installed by the Dutch wind turbine construction company Lagerwey (now Enercon). The second turbine was built with a special climbing crane; the first climbing crane in the world.



STEVEDORING COMPANIES

Specialized stevedoring companies like Buss Terminal Eemshaven, Sealane, Wagenborg, Wijnne Barends and BOW Terminal have been established in Eemshaven. They all offer quay facilities and handle logistic activities and have lots of experience in offshore wind business. Amasus Shipping and EMS Maritime Offshore also provide logistic services and offer for instance jetty capacity.

OFFERING BERTHS QUAYS



www.buss-terminal-eemshaven.com



www.sealane.nl



www.wagenborg.com



www.wijnnebarends.com



www.bowterminal.nl

PRIVATE JETTIES



www.offshoreservice.de



www.amasus.nl

OFFSHORE RELATED COMPANIES

- 2-B Energy
- Alert
- Broekman Logistics
- CIV Offshore
- Collé Rentals
- Customs
- Datema Nautical Safety
- DHSS
- Eekels
- Fugro
- Geoplus
- Hef en Hijs Nederland
- HICE
- Hijsspecialist.nl
- Hydraukom
- Kloska
- Lagerwey
- Lubbers Logistics Group
- Maintec
- Marine Offshore Solutions
- Military Police
- Niestern Sander
- OWF (Boskalis | Volker Wessels)
- Peterson
- Reym
- Seaway Offshore Cables
- Siemens Gamesa
- Siri Marine
- SMST
- TenneT GmbH
- TenneT Nederland
- Total Offshore
- Total Ship Supply
- Total Wind
- Unishore
- Van Oord
- Vestas
- WIND Cable Logistics
- Windea



SERVICE OFFSHORE VESSELS (SOV's)

In recent years, Eemshaven has not only grown into an important base port for offshore wind logistics (16 offshore wind farms have been constructed via Eemshaven), but also into a service port for the maintenance of the currently installed offshore wind turbines. Eemshaven is already the maintenance base for the Gemini, Veja Mate, Merkur Offshore and Deutsche Bucht wind farms (316 turbines in total). Each wind farm uses its own service offshore vessel for operation & maintenance activities. Eemshaven is base port for the vessels below and offers sufficient berthing places for other SOV's, cable layers and/or supply vessels.

Windea La Cour for Gemini



Island Diligence for Trianel Borkum II



Jules Verne | Esvagt Albert Betz for Deutsche Bucht



Skandi Constructor for Merkur Offshore



REFERENCES

EEMSHAVEN

OFFSHORE WIND

July 2009



JB 114 for Alpha Ventus
Julianahaven

June 2011



Thor (Hochtief) for Alpha Ventus
Wagenborg, Julianahaven

September 2012



Oleg Strashnov for Borkum Riffgat
Wilhelminahaven

April 2013



Bold Tern for Bard Offshore I
Wagenborg, Julianahaven

July 2013



Innovation for Global Tech I
Buss Terminal Eemshaven,
Julianahaven

September 2013



MPI Adventure for Trianel Borkum
Buss Terminal Eemshaven,
Julianahaven

March 2014



Pacific Orca for Riffgrund I
Buss Terminal Eemshaven,
Julianahaven

March 2014



Borwin Beta for Merkur Offshore
Wijnne Barends, Beatrixhaven

August 2014



Wave Walker for Gemini
Sealane, Emmahaven

September 2015



Aeolus | Pacific Osprey for Gemini
Buss Terminal Eemshaven,
Julianahaven

September 2015



Brave Tern
Beatrixhaven

March 2016



Windlift 1 for Bard Offshore
Wagenborg, Julianahaven

“EEMSHAVEN OFFERS OPTIMAL CONDITIONS FOR OFFSHORE VESSELS. SPACE, WELL-SKILLED LOGISTIC PROVIDERS AND THE PRESENCE OF FACILITIES NEEDED”

March 2016



Seajacks Scylla for Veja Mate
Buss Terminal Eemshaven,
Julianahaven

August 2016



Seajacks Zaratan for Veja Mate
Buss Terminal Eemshaven,
Julianahaven

August 2016



Innovation for Race Bank (UK)
Buss Terminal Eemshaven,
Julianahaven

November 2016



Saipem 7000 (maintenance)
Wilhelminahaven

March 2017



MPI Enterprise for Nordsee One
Buss Terminal Eemshaven,
Julianahaven

November 2017



Sea Challenger for Merkur Offshore
Buss Terminal Eemshaven,
Julianahaven

February 2018



Vole au Vent for Borkum Riffgrund II
Wagenborg, Julianahaven

May 2018



Seafox 5 for Merkur Offshore
Buss Terminal Eemshaven,
Julianahaven

June 2018



Pacific Osprey for Hohe See
Buss Terminal Eemshaven,
Julianahaven

February 2019



Innovation for Albatros
Wagenborg, Julianahaven

July 2019



Taillevent for Trianel Borkum II
Doekegatkanaal

March 2021



Wind Orca for Hornsea Two (UK)
Buss Terminal Eemshaven,
Julianahaven

LARGE-SCALE GREEN HYDROGEN PRODUCTION | NORTH₂

NorthH₂ wants to produce as much as 4 gigawatts of green hydrogen by 2030, which will fulfil one of the goals set by the Dutch Climate Agreement. But the ambition goes further than that. NorthH₂ wants to upscale to more than 10 gigawatts by 2040. By then, green hydrogen output, which will initially be produced in Eemshaven and later possibly offshore as well, will total around one million metric tons on an annual basis, cutting carbon emissions by over eight to ten megatons a year. The consortium, consisting of Gasunie, Groningen Seaports, Shell Nederland, Equinor and RWE, has the support of the Groningen provincial authority and does not rule out other serious partners joining the project further down the line.

Offshore wind

To make green hydrogen, you need green power. In the NorthH₂ case, this green power is wind power. This is why NorthH₂ aspires to develop large wind farms for what is currently Europe's most ambitious wind-to-hydrogen project, well out of sight from the Wadden Islands, between 80 and 100 kilometres from the coast of the northern Netherlands.



OFFSHORE WIND INNOVATION CENTRE | OWIC

The Offshore Wind Innovation Centre (OWIC) in Eemshaven is an information, training and innovation organisation for companies and knowledge institutions involved in offshore wind energy. The OWIC facilitates the development of activity and innovation in the field of offshore wind energy. It brings together knowledge and experience and makes it accessible to public authorities, knowledge institutions and the business community. The OWIC enables companies to innovate and develop in offshore wind energy more quickly and easily, focusing on operations & maintenance (O&M) activities. The OWIC is the place to go for information and get in touch with others involved in the subject. The OWIC is also setting up training and education facilities for offshore wind energy.

The OWIC has now initiated a number of projects: Droneport Eemshaven, which focuses on wind turbine inspections, Cable Centre Eemshaven, an alliance of companies whose activities include cable storage, flushing and transport, and Ocean Grazer, a start-up company working on a test field for energy storage at Eemshaven.



EEMSHAVEN: POWER POINT (8,000 MW) FOR WIND ENERGY

Eemshaven is not only base port or service port for the offshore wind industry, but it is also the landing port for international connections, especially for wind energy. Several converter stations are operational in Eemshaven and there are connections with Norway, UK, Germany, and Denmark. Add the energy producing companies established in Eemshaven and it is obvious that with a capacity of 8,000 MW Eemshaven is the power point of and balancing hub for Northwest Europe.



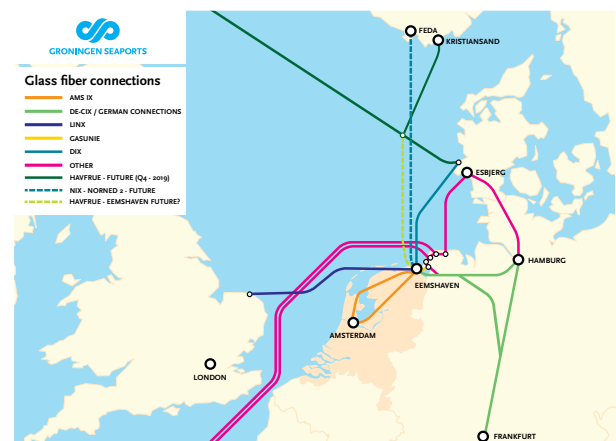
Landing station Gemini



Wind farm 'Ten noorden van de Waddeneilanden' will land in Eemshaven



Converter station TenneT | NorNed (above) - undersea high voltage cable between Eemshaven (NL) and Feda (N) and TenneT | COBRA (under) - cable between Eemshaven (NL) and Endrup (DK).



Present and future fibre connections e.g. the COBRACable to Denmark. It is expected that many future wind farms are located close to this COBRACable.

NAUTICAL POSSIBILITIES



BEATRIXHAVEN

Length	1,200 m
Width	110-150 m
Draught max.	7.5 m
Jacking permitted	Yes

QUAY:

Quay length (south)	1,200 m (pressure 4-6 ton/m²)
Quay length (west)	220 m (pressure 30 ton/ m²)
Quay width	30 m
Quay height	4.4 m

PASSAGE WIDTH SLIDING GATES

Heavy load quay	10.6 m
Holemans	8.3 m
Heliport	6.9 m

OTHER FACILITIES:

Private jetty	300 m
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JULIANAHAVEN

Length	1,200 m
Width	200-250 m
Draught max.	11.5 m
Jacking permitted	Yes, >15 m from quay *

QUAY:

Quay length (north)	1,100 m (pressure 6-20 ton/m²)
Quay length (south)	1,200 m (pressure 2.5-7.5 ton/m²)
Quay width	varies
Quay height	4.4 m

PASSAGE WIDTH SLIDING GATES:

Holland Malt	8.2 m
Wijnne Barends	8.5 m
Westlob	8.6 m

WILHELMINAHAVEN

Length	1,200 m
Width	275-350 m
Draught max.	14 m
Jacking permitted	Not allowed

QUAY:

Quay length (north)	525 m (pressure 4-10 ton/m²)
Quay length (south)	450 m (pressure 4-6 ton/m²)
Quay length (east)	275 m (pressure 4-6 ton/m²)
Quay width	40 m
Quay height	5.5 m

PASSAGE WIDTH SLIDING GATES:

North quay	6.15 m
South quay	10.05 m
Losstoep Theo Pouw	6.10 m

EMMAHAVEN

Length	500 m
Width	110-150 m
Draught max.	7.5 m
Jacking permitted	Not allowed

QUAY:

Quay length (north)	135 m (pressure 4-6 ton/m²)
Quay width	varies
Quay height	4.4 m

OTHER FACILITIES:

Private jetty	130 m
Services jetty	120 m
Floating jetty	740 m
Losstoep Wagenborg	320 m (mooring location pontoons)

* Subject to location and penetration spudcans
 "Groningen Seaports believes that the mentioned details are correct, but some data may be subject to changes"

SOIL CONDITIONS

EEMSHAVEN SUITABLE

FOR JACKING

The port of Eemshaven is situated in the north of the Netherlands at the river Ems close to Germany, bordering the Wadden Sea. Most of the port area is reclaimed land outside the primary dikes. The area has been raised with 4 to 5 m sand, therefore providing stable soil conditions for on-shore developments. Jack-up vessels frequently visited Eemshaven during the last years to load heavy equipment required for the construction of wind farms.

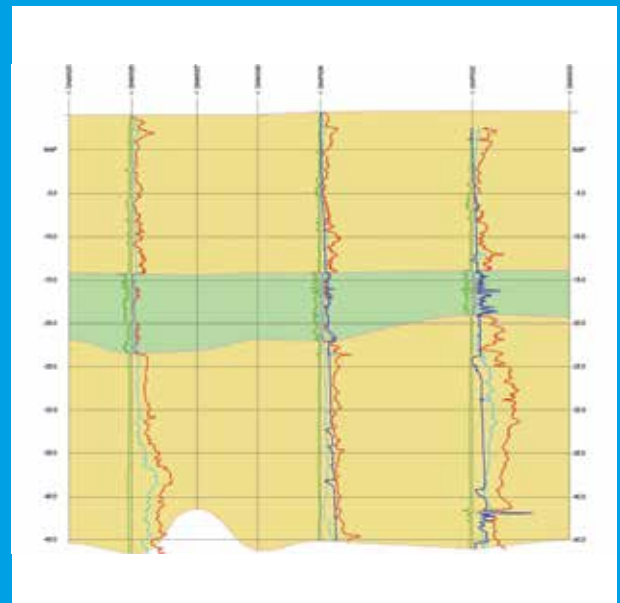


JULIANA- AND BEATRIXHAVEN BASINS

Based on cone penetration tests a W-E profile has been constructed directly North of the western part of the Juliana harbour basin. The depth of the soil profile is 50 m starting at approximately NAP+4,5 m. The profile shows a sandy top layer to approximately NAP -15 m, followed by a layer of clayey silt, silty clay to NAP-19 m/ NAP-23 m. Underneath follows generally a well compacted sand layer.

FIGURE 1 >>

Soil profile W-E North side western part of the Julianahaven basin (length profile appr. 600 m.). The soil profile shown in figure 1 gives an impression of the soil conditions of this part of the Eemshaven. Variations can occur depending on the exact area of interest.



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