FOLLOW THE ENERGY

EEMSHAVEN: MAIN HUB IN OFFSHORE WIND INDUSTRY

EEMSHAVEN

EEMSHAVEN MEETS MARITIME REQUIREMENTS OFFSHORE WIND INDUSTRY

- Draught: 7.5 - 14 m.
- Quay length: 5,293 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 and 20 tons/m²
- Limited tidal range (2.5 m.)
- Approx. 11 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 one of 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 took place for the world's largest offshore wind farm: Hornsea Two (UK). During 2023 installation of wind farm Hollandse Kust Noord took place. Eemshaven has also a prominent role in the project NortH2, an international consortium that is jointly investigating the feasibility of large-scale production, storage and transmission of green hydrogen. TKF (Twentsche Kabelfabriek) chose Eemshaven for its cable factory and the consortium Decom North concluded a covenant that marks the start of a closed chain for the supply, dismantling and recycling of wind turbine blades in Eemshaven.

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, Albatros, Trianel Windpark Borkum II, Hornsea Two, Kaskasi and Hollandse Kust Noord. At the moment Eemshaven serves as base port for the Gode Wind 3, Borkum Riffgrund 3 and He Dreiht offshore wind farms. In the near future many offshore wind projects are planned in which Eemshaven could be involved.

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.

ERIK BERTHOLET
business manager logistics & offshore wind
E-mail e.bertholet@groningen-seaports.com
Phone +31 (0)65 393 9275

FOLLOW THE ENERGY

LOGISTICS:

- 21 projects
- 8.0 GW (of which 3.0 GW turbines and 5.0 GW foundations)
- 1,291 turbines

OPERATION & MAINTENANCE (O&M):

- 6 windfarms
- 2.5 GW
- 474 turbines

OFFSHORE SHIPPING MOVEMENTS (2023):

- Work ships: 65
- Service Offshore Vessels (SOV's)/Jack-ups: 463
- Crew Transfer Vessels (CTV's)/Supply vessels: 511

HELICOPTER FLIGHTS (2023): 44

TABLE OF CONTENT

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 excellent 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, Hornsea Two, Kaskasi and Hollandse Kust Noord**. 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 in 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.

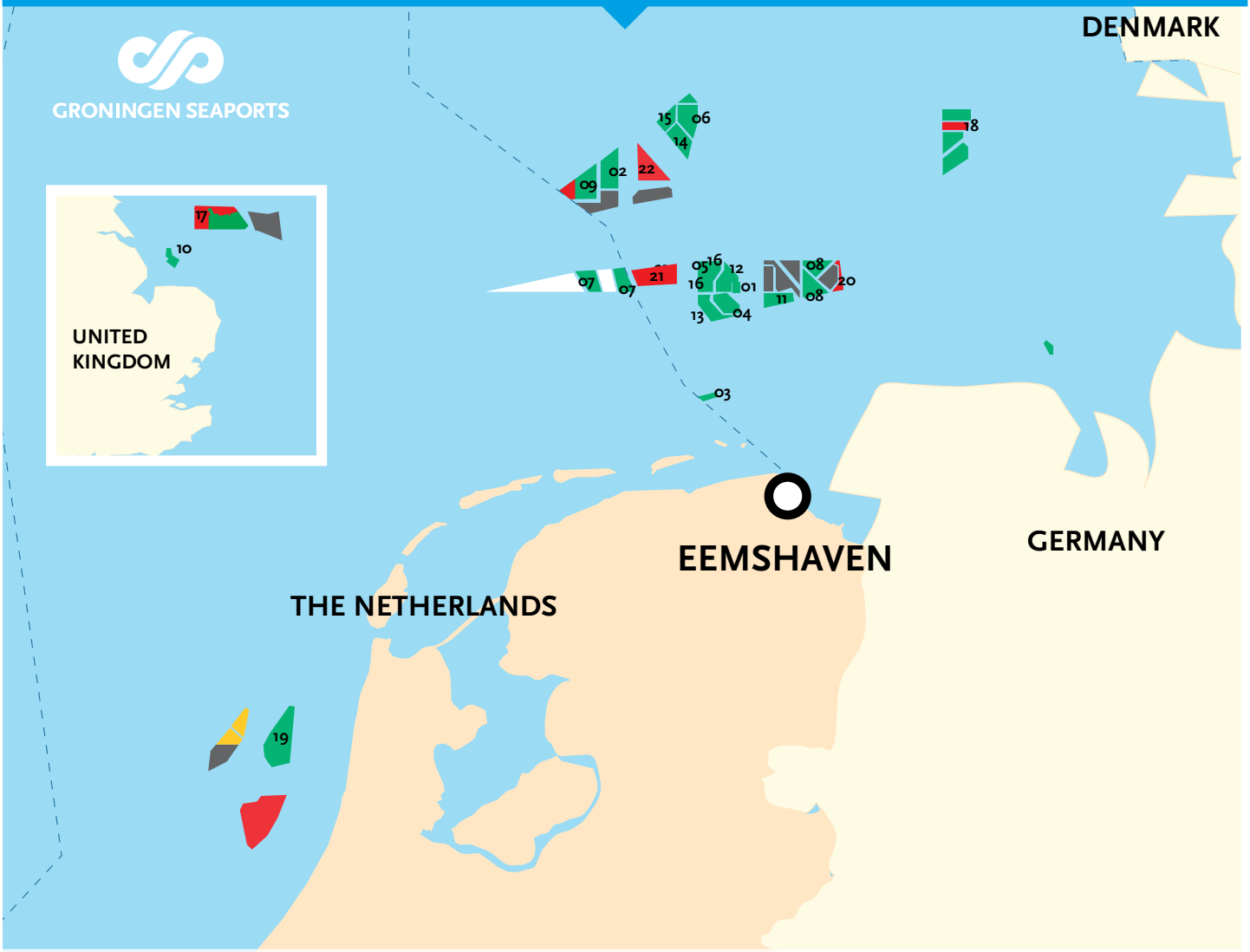
SERVICE PORT

Both Emmahaven 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 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
- Direct access to the North Sea
- Competitive lease prices
- Multimodal accessibility (road, rail, water, air)
- Presence of a heliport; close to airport
- Approx. 11 hectares offshore sites available
- Sufficient paived/unpaived 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 and 20 tons/m² available)
- Extra widened bends to transport rotor blades and other exceptional components, even monopiles



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
19 **HOLLANDSE KUST NOORD**
69 TURBINES | 759 MW | 125 MILES TO EEMSHAVEN
20 **GODE WIND 3**
23 TURBINES | 253 MW | 40 MILES TO EEMSHAVEN
21 **BORKUM RIFFGRUND 3**
83 TURBINES | 913 MW | 30 MILES TO EEMSHAVEN
22 **HE DREIHT**
64 TURBINES | 960 MW | 50 MILES TO EEMSHAVEN

IN USE
UNDER CONSTRUCTION
APPROVED
REQUESTED
IN CONCEPT

EEMSHAVEN:
SERVICE PORT FOR MAINTENANCE ACTIVITIES

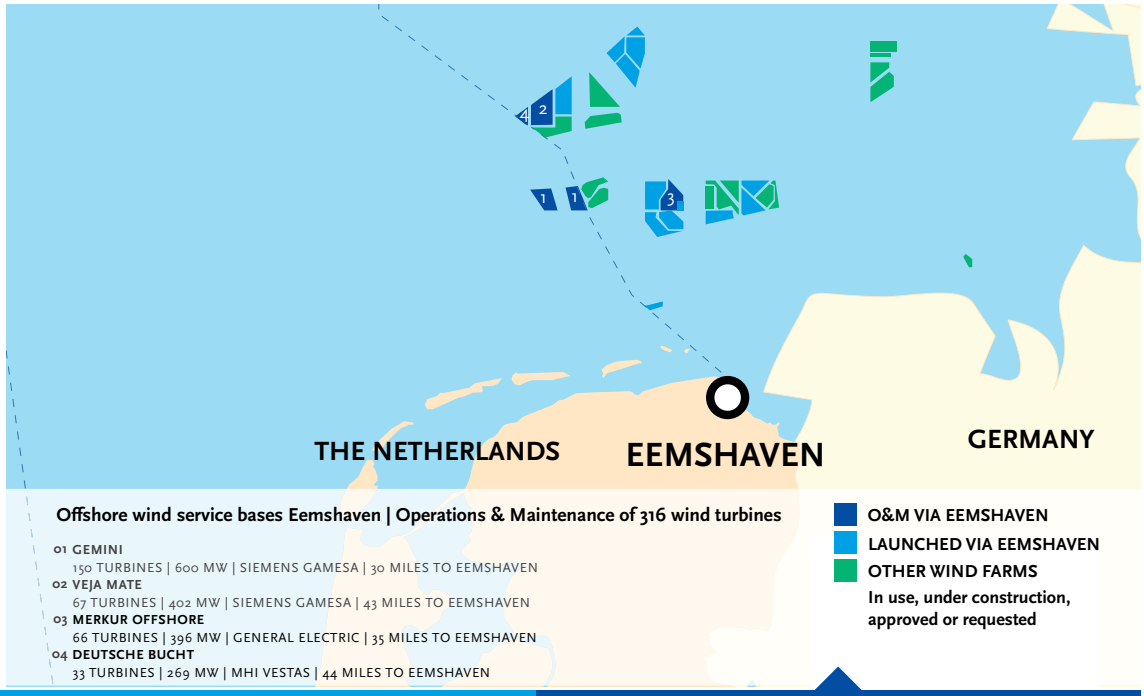
The profile of Eemshaven answers to be a service port for activities regarding the operations and maintenance (O&M) of offshore wind turbines. Both Emmahaven and Beatrixhaven are suitable to accommodate these kind of activities. There are sufficient berthing places for service operation vessels, cable 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 jetty capacity (300 metres) and offers 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 Wijnne Barends operates a terminal and accommodates Subsea 7/Seaway Offshore Cables. A supplier of building materials, Holemans Nederland, has established next to Wijnne Barends. Bek & Verburg, a specialist in waste collection, and Clarksons (DHSS), a vessel agency and port service provider, together have a offshore service base behind the quay. Vestas uses the Clarksons Facility as O&M base for the Deutsche Bucht wind farm. At the western part Buss Terminal Eemshaven has a storage area for wind turbine parts and TKF produces cables for offshore wind farms.



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. Clarksons (DHSS) (storage + quay)
5. Wagenborg (storage + quay)
6. Sealane (storage + quay)
7. Amasus Shipping (storage + jetty)
8. RelyOn Nutec (training centre)
9. Gulf (bunkering)
10. Nijlicht (offices)
11. Services jetty (mooring facility)
12. Floating jetty (mooring facility)
13. Business sites (buy or lease)

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 transhipment 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 transhipment 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 monopile 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. Holemans Nederland, a supplier of primary building materials, has a location next to Wijnne and Barends. A supplier of building materials, Holemans Nederland, has established next to Wijnne Barends. Bek & Verburg, a specialist in waste collection and segregation, and Clarksons (DHSS), a vessel agency and port service provider, have also constructed an offshore service base behind the southern quay. Clarksons accommodates also Vestas for the O&M of wind farm Deutsche Bucht (33 turbines). On the western side Buss Terminal Eemshaven has a storage area for wind turbine parts and TKF (Twentsche Kabelfabriek) produces cables for offshore wind farms. 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 service-hubs on the EMO premesis to operate and maintain 283 wind turbine generators for Gemini, Veja Mate and Merkur Offshore.

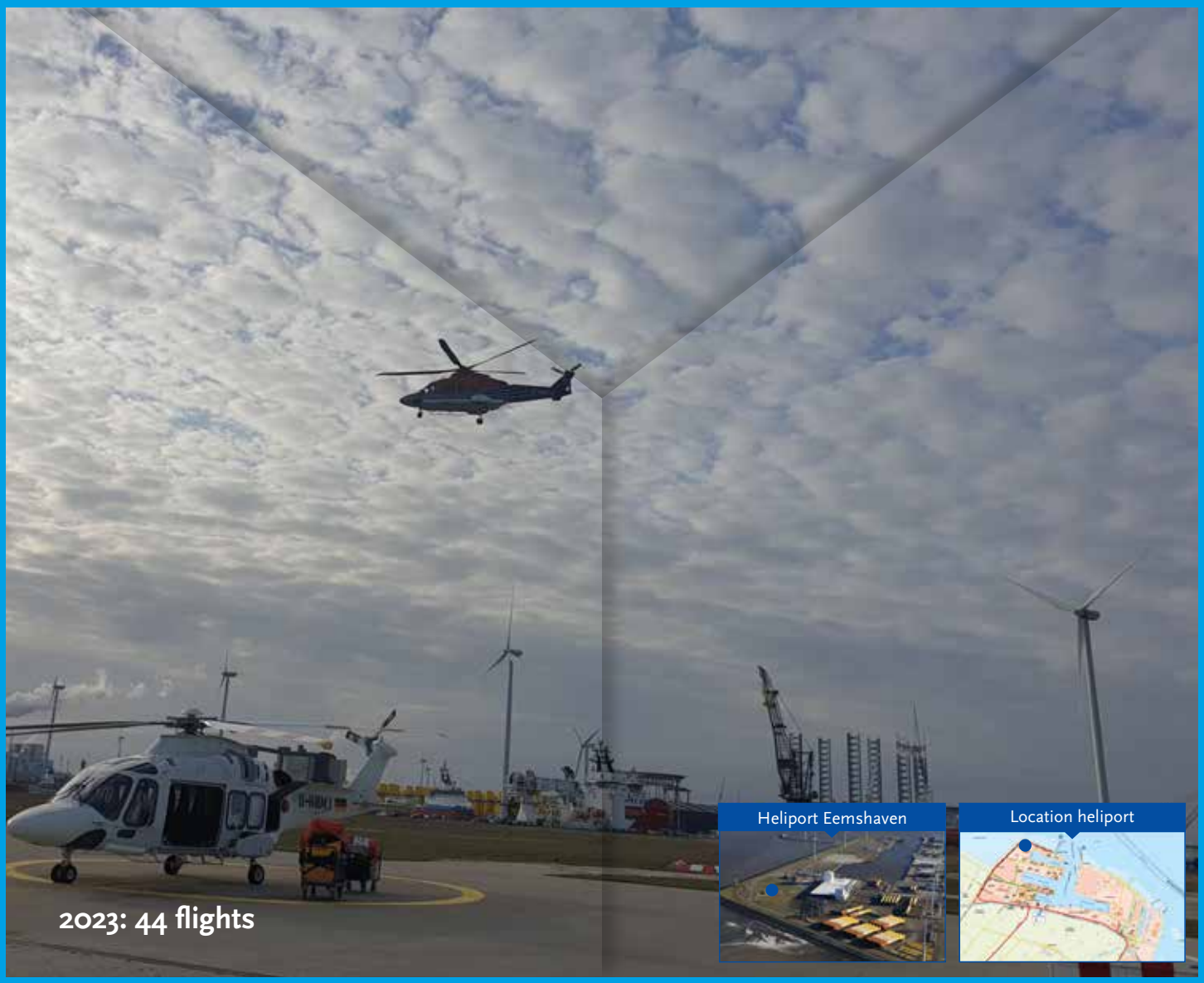
FOR SALE APPROX. 11 HECTARES OFFSHORE SITES IN EEMSHAVEN

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.




3
1
2

STEVEDORING COMPANIES

Specialized stevedoring companies like Buss Terminal Eemshaven, Sealane, Wagenborg, and Wijnne Barends have been established in Eemshaven. They all offer quay facilities, 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

PRIVATE JETTIES

www.offshoreservice.de

www.amasus.nl

OFFSHORE RELATED COMPANIES

- 2-B Energy
- Alert
- BOW/Q3 Group
- Broekman Logistics
- CIV Offshore
- Clarksons/ DHSS
- Collé Rentals
- Customs
- Datema Nautical Safety
- Eekels
- Enercon
- Eqin
- Fugro
- Geoplus
- Hef en Hijs Nederland
- HICE
- Hijsspecialist.nl
- Hydraukom
- Kleinveld
- Lubbers Logistics Group
- Maintec
- Marine Coordination Services
- Marine Offshore Solutions
- Military Police
- Niestern Sander
- OWF (Boskalis | Volker Wessels)
- Peterson
- RelyOn Nutec
- Reym
- Subsea7
- Siemens Gamesa
- Siri Marine
- SMST
- TenneT GmbH
- TenneT Nederland
- Total Offshore
- Total Ship Supply
- Total Wind
- Twentsche Kabelfabriek (TKF)
- 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 (18 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

SOV's in Beatrixhaven for several projects

SOV's in Beatrixhaven for several projects

Skandi Constructor for Merkur Offshore

REFERENCES EEMSHAVEN OFFSHORE WIND

July 2009

JB 114 for Alpha Ventus
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

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

March 2016

Seajacks Scylla for Veja Mate
Buss Terminal Eemshaven,
Julianahaven

August 2016

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

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

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

March 2022

Seaway Strashnov for Kaskasi
Buss Terminal Eemshaven, Julianahaven

June 2023

Wind Osprey for Hollandse Kust Noord
Buss Terminal Eemshaven, Julianahaven

June 2023

Les Alizés for Borkum Riffgrund III
Wagenborg, Julianahaven

OFFSHORE WIND NEEDED TO MAKE **GREEN HYDROGEN**

To make industry greener, we need to be able to rely on a stable, large supply of green hydrogen. Such a large-scale supply is only possible if we tackle the entire supply chain simultaneously. Green hydrogen requires green energy and thus wind power. The Dutch government has designated locations in the Offshore Wind Roadmap that add up to 21 GW of installed capacity.

The green hydrogen that is produced contributes to the total sustainable energy system of the future. Where possible, direct electrification remains the first choice. However, green hydrogen is also crucial to balance the system and to enable sustainability of activities for which electricity cannot be used, for example because very high temperatures have to be used.

A future-proof energy system therefore requires green hydrogen on a large scale, which is made from truly sustainable green energy. In order to create that stable supply, there will be built many wind turbines at sea. Eemshaven will play an important role in greening the industry. Not only as base or marshalling port for the installation of offshore wind farms, but also as location where electrolyzers will be established to produce green hydrogen.

UNIQUE COLLABO-RATION EUROPEAN WIND PORTS

Even though they are usually competitors, representatives of the six largest wind ports in Europe shook hands and signed a declaration in January 2023 at Port Esbjerg in Denmark. They have agreed to join forces to speed up the green transition in order to meet Europe's ambitious offshore wind deployment targets. The ports lack capacity. The European offshore wind strategy target is to deploy at least 65 GW of offshore wind by 2030. A tall ask. Not least considering that there is currently just over 13 GW in the seas around Europe. In other words, Europe aims to install well over five times as much offshore wind in the next seven years as we have built during the previous twenty years. This target puts great pressure on European wind ports because there is currently not enough port capacity to install all these offshore wind farms by the deadline.

Seven of Europe's leading wind ports will try to change that. Although they are competitors, they have joined forces in a collaboration. The aim is to collaborate at an operational and practical level. The ports that have entered the unique collaboration are Port Oostende (Belgium), Groningen Seaports/Eemshaven (The Netherlands), Niedersachsen Ports/Cuxhaven (Germany), Nantes-Saint Nazaire Port (France), Humber (UK), Port Esbjerg (Denmark), and Port Szczecin-Swinoujscie (Poland).

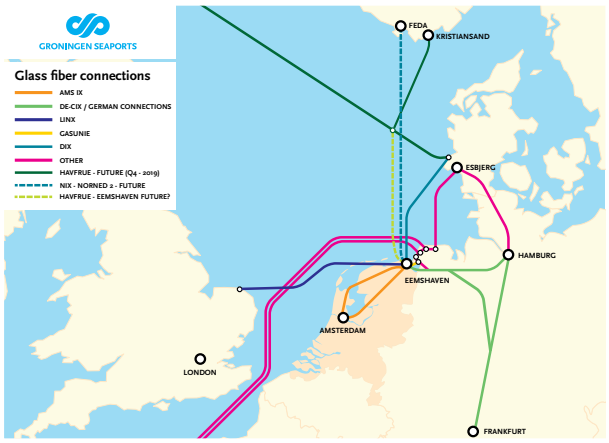
EEMSHAVEN:
POWER POINT (8,000 MW) FOR WIND ENERGY

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

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)	250 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

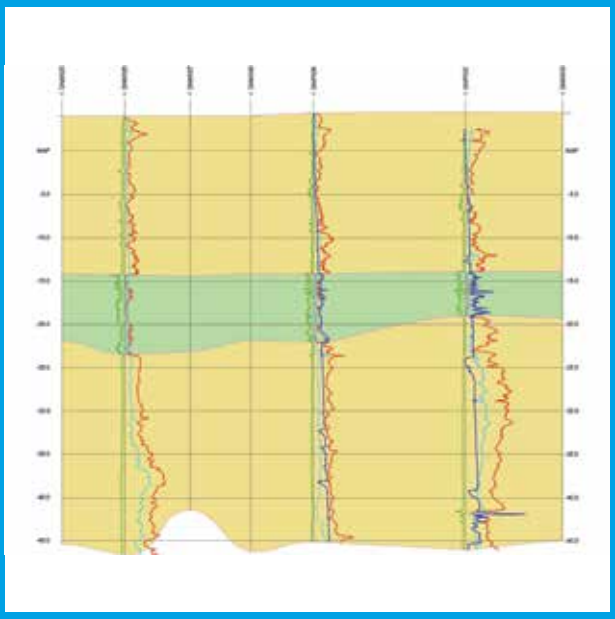
EEMSHAVEN SUITABLE FOR JACKING

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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EEMSHAVEN

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