FOLLOW THE ENERGY

EEMSHAVEN: MAIN HUB IN OFFSHORE WIND INDUSTRY

EEMSHAVEN

TeamNL

H2 missieH2.nl

Missie H2 is supported by

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 big 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. 90 hectares offshore sites available

GOALS | PLANNING UP TO 2030

GOALS 2020:

Netherlands (west coast):	± 4.5 GW
Germany (German Bight North Sea):	± 6.5 GW
United Kingdom	± 10 GW

GOALS 2030:

Netherlands (west & northern coast):	± 11.5 GW
Germany (German Bight North Sea):	± 20 GW
United Kingdom:	± 30 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 park in the Netherlands. The port also plays a prominent role in the development of wind parks 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. The arrival of the heliport makes Eemshaven's position in the offshore wind sector even stronger and also the completion of the COBRAcable. COBRAcable links Eemshaven (the Netherlands), through the German sector of the North Sea, to Endrup (Denmark). This interconnector is also designed to enable the connection of offshore wind farms, which will contribute to the realization of a sustainable international energy landscape. It is expected that many future wind farms are located close to this COBRAcable.

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, and Albatros. Currently Trianel Windpark Borkum II 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.

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

FOLLOW THE ENERGY

LOGISTICS:

- 16 projects
- 5.4 GW (of which 2.2 GW turbines and 3.2 GW foundations)
- 1020 turbines

OPERATION & MAINTENANCE (O&M):

- 4 windfarms
- 1.7 GW
- 316 turbines

OFFSHORE SHIPPING MOVEMENTS (until 31st October 2019):

- Installation Vessels: 55
- Service Offshore Vessels (SOV's): 459
- Crew Transfer Vessels (CTV's): 1665

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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 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** and **Trianel Windpark Borkum II**. 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 (MHI 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.

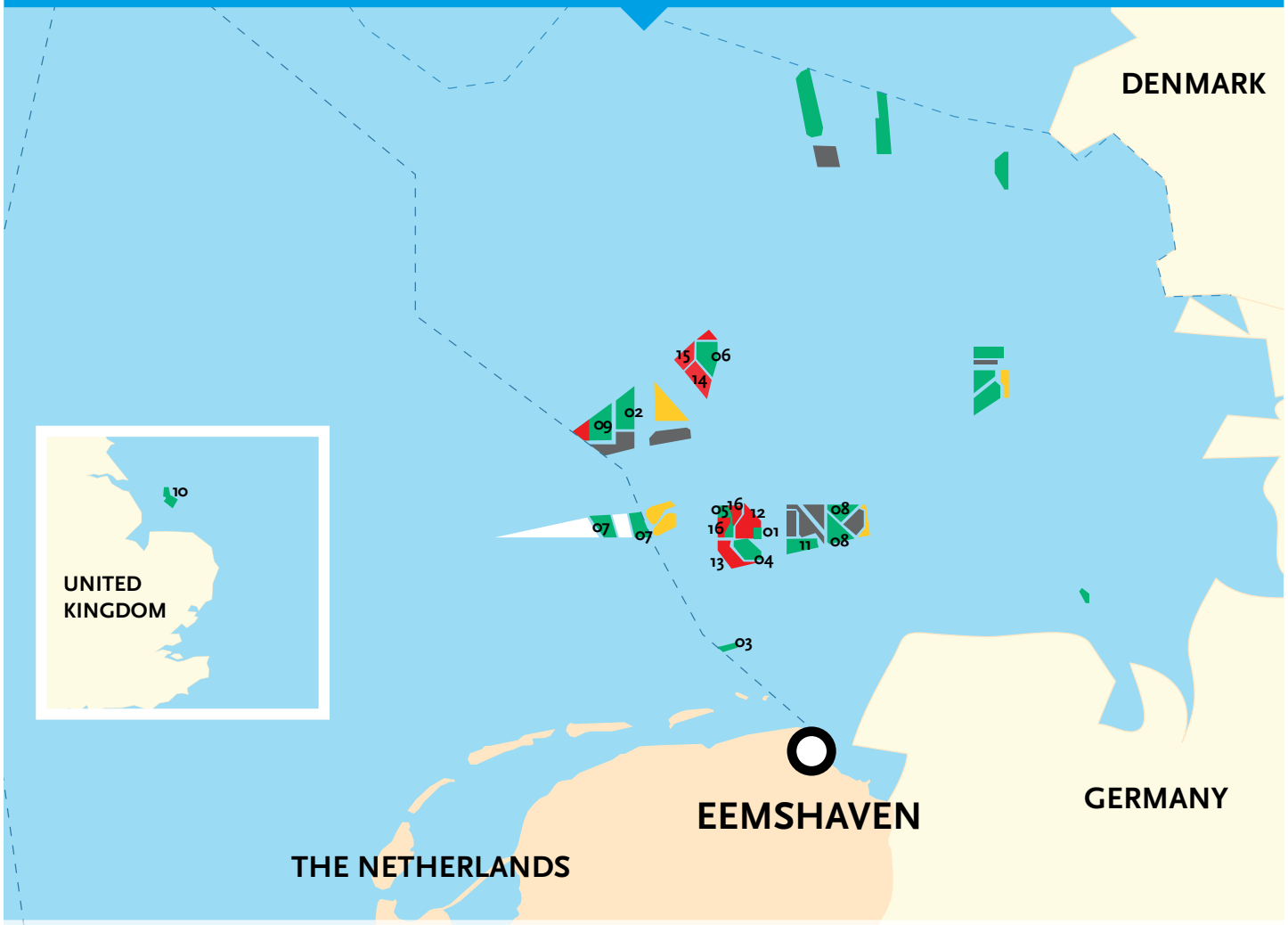
SERVICE PORT

Both 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 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 purchase and lease prices
- Multimodal accessibility (road, rail, water, air)
- Presence of a heliport; close to airport
- Approx. 90 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, 20 tons/m² and 10 tons/m² available)



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

IN USE
UNDER CONSTRUCTION
APPROVED
REQUESTED
IN CONCEPT

EEMSHAVEN:
SERVICE PORT FOR MAINTENANCE ACTIVITIES

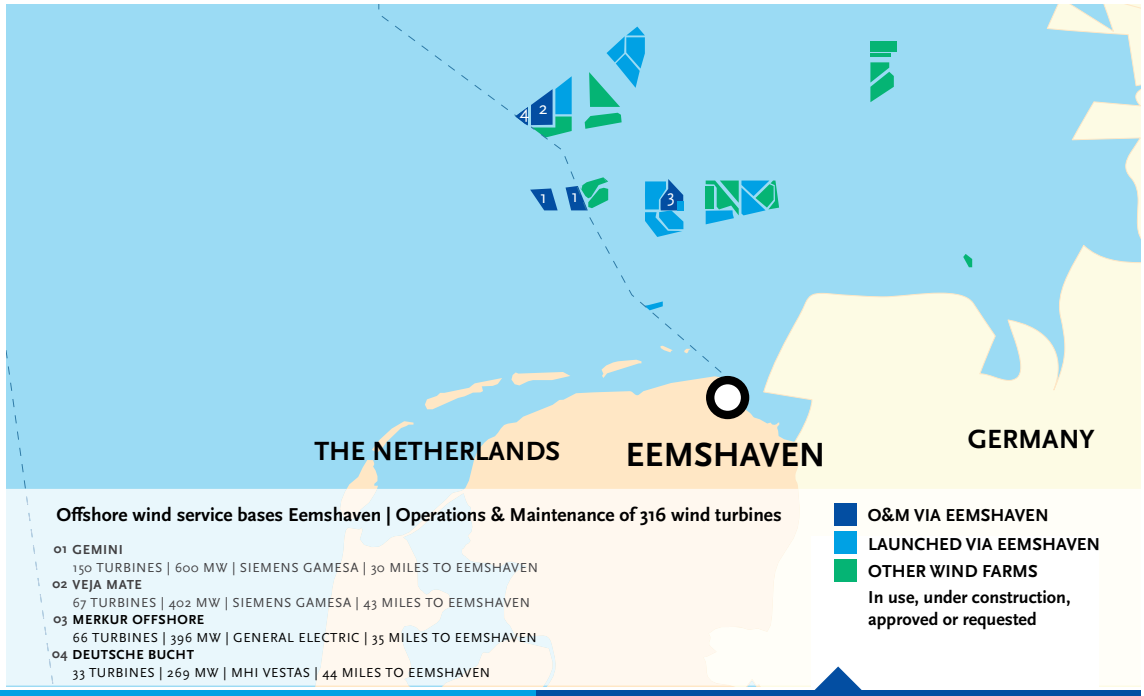
The profile of Eemshaven answers to be a service port for activities regarding the operations and maintenance (O&M) of offshore wind turbines. Both Emmahaven and Beatrixhaven are suitable to accommodate these kind of activities. There are sufficient berthing places for service operation vessels, cable 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 130 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. MHI 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 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 1300 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. 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 MHI 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 premesis 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 90 hectares there is enough space for establishment.

FOR SALE APPROX. 90 HECTARES OFFSHORE SITES IN THE EEMSHAVEN

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

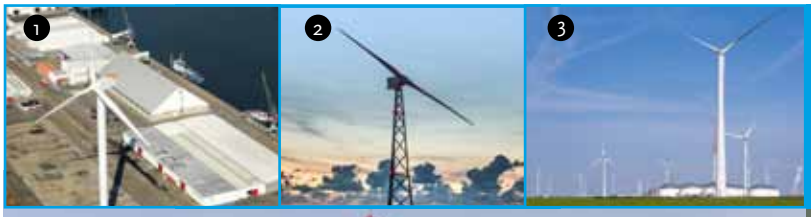
HELIPORT EEMSHAVEN

EMS Maritime Offshore operates the new heliport in Eemshaven. The official opening took place on Friday 13 September 2019 by Minister Wiebes of Economic Affairs. The commissioning of the heliport will further strengthen Eemshaven's position in the offshore wind sector. The helicopters handled there will mainly be used for the maintenance of the offshore wind turbines on the high seas, but can also be used for ambulance and trauma flights and for example, for piloting ships. On average, up to 15 flights per day are expected. Eemshaven is already the maintenance base for the Gemini, Veja Mate, Merkur Offshore and Deutsche Bucht wind farms (316 turbines in total) and in view of its location, the presence of the entire supply chain, the potential of many more planned wind turbines in the North Sea and the presence now of this landing and take-off area for helicopters, Eemshaven has become more attractive as service base for offshore wind farms.

Interested in helicopter flight handling services via Heliport Eemshaven? Please contact **heliport@offshoreservice.de** by mail.

OFFSHORE WIND TEST TURBINES **EEMSHAVEN**

Senvion, 2-B Energy and Lagerwey have test turbines in Eemshaven. Senvion 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 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. The second turbine was built with a special climbing crane; the first climbing crane in the world.



TEST TURBINES EEMSHAVEN

1. Senvion (6 MW; from 2012)
2. 2-B Energy (6 MW; from 2015)
3. Lagerwey (4.5 MW; from 2017)

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
- Hydraukom
- Hijsspecialist.nl
- Kloska
- Lagerwey
- Maintec
- Marine Offshore Solutions
- MHI Vestas
- Military Police
- Niestern Sander
- OWF (Boskalis | Volker Wessels)
- Peterson
- Reym
- SCC
- Seaway Offshore Cables
- Senvion
- Siemens Gamesa
- Siri Marine
- TenneT GmbH
- Tideway
- Total Ship Supply
- Total Wind
- Unishore
- Van Oord
- 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

Vestland Cygnus for Merkur Offshore

Acta Centaurus for Deutsche Bucht

Acergy Viking for Veja Mate

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

February 2015

Flintstone for Godewind II
Buss Terminal Eemshaven,
Julianahaven

September 2015

Aeolus | Pacific Osprey for Gemini
Buss Terminal Eemshaven,
Julianahaven

September 2015

Brave Tern
Beatrixhaven

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

March 2016

Windlift 1 for Bard Offshore
Wagenborg, Julianahaven

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

6 GW WIND AT SEA ABOVE THE WADDEN

Both the province of Groningen and the State have determined that offshore wind farm conditions in the Wadden Sea Area above Groningen are excellent. Preparations for 700 MW of new wind farms 'North of the Wadden' have already been started. On behalf of the Netherlands Enterprise Agency (RVO) the Swedish company MMT has carried out a geophysical survey for this new wind energy area in the North Sea. This survey activities are in fact the first phase of the 700 MW expansion of additional offshore wind farms planned north of the Wadden Sea to the west of the Gemini wind farm. This data will be used by offshore wind farm developers to prepare a good bid for the construction of the wind farms.

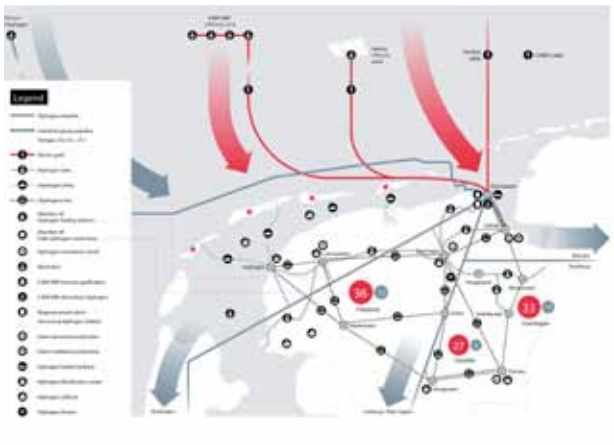
MORE WIND AT SEA NEEDED FOR **GREEN HYDROGEN**

The Northern Netherlands is uniquely positioned to develop one of the first green hydrogen economies in Europe. In the future, the capacity of offshore wind farms connected to the Eemshaven will increase, either from the Dutch portion of the North Sea or from the German portion: an additional 4,000 MW by the year 2030 is a realistic estimate. It is safe to say that the Eemshaven will develop into a green electricity hub where more than 6,000 MW of green electricity will be made available from offshore and onshore wind farms and offshore electrical cables.

A huge amount of hydrogen is needed to greening the (chemical) industry in Delfzijl

Vattenfall, Gasunie and Equinor have far advanced plans to rebuild the Magnum power plant to store green hydrogen

Google expands its datacenter in Eemshaven (the biggest iin Europe) and need lots of green energy



Overview of the hydrogen projects in the Northern Netherlands

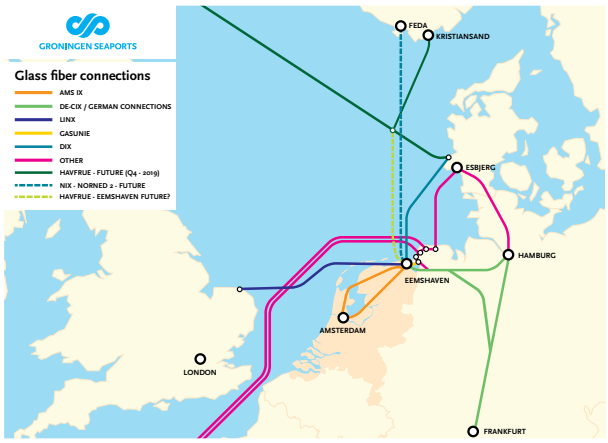
EEMSHAVEN:
POWER POINT (8,000 MW) FOR WIND ENERGY

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

Nuon Magnum - Rebuild to a huge battery (ammonia storage) to store green hydrogen

Converter station TenneT | NorNed (left) - undersea high voltage cable between Eemshaven (NL) and Feda (N) and TenneT | COBRA (right) - 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

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

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

OTHER FACILITIES:

Private jetty	300 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

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

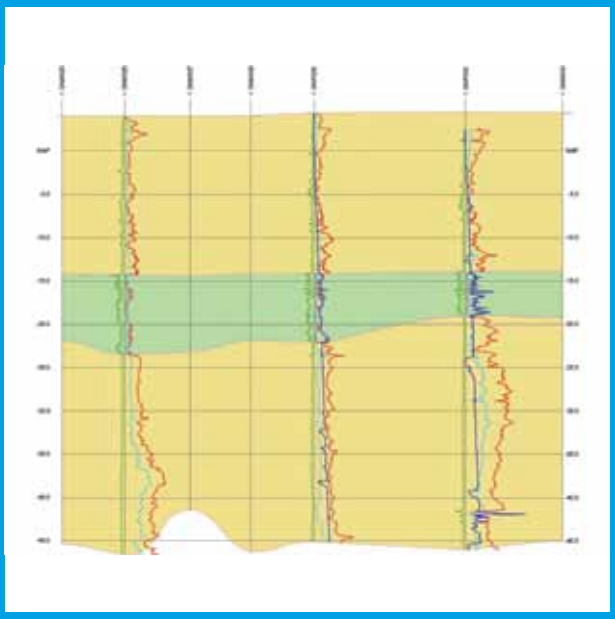
EEMSHAVEN SUITABLE FOR JACKING

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.



OUR MEMBERSHIPS

Wind EUROPE

www.windeurope.org

Wind EUROPE OFFSHORE WIND PORTS PLATFORM

www.windeurope.org/policy/topics/offshore-wind-ports/

NWEA

www.nwea.nl

NORTHERN NETHERLANDS OFFSHORE WIND NNOW

www.nnow.nl

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