# Norseman

## An innovative hybrid project as gateway for a global Norwegian supply chain

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EnBW Energie Baden-Württemberg AG

Norseman Wind as — EnBW

Norseman consortium at a glance

# The Norseman consortium combines international development expertise with top players of a future Norwegian offshore wind supply chain

**EnBW**:
Integrated energy utility and one of Europe's leading offshore wind developers and operators with approx. 1 GW in operation

**NorgesGruppen / Asko Fornybar**:
Will develop offshore wind to cover its own power requirements already ensuring power offtake for a part of the capacity

**Greenstat:**
Will develop innovative hydrogen solutions, e.g. offshore hydrogen production

**Norseman Wind**:
Project company that is the core of the consortium and license applicant

**Hitachi ABB Power Grids:**
World-leading company in HVDC technology

**Aker Solutions:**
Will supply foundations, HVDC box and installation

**Seafront Group:**
Will develop logistics, ware-housing and port solutions based in Agder

**Energy Innovation:**
Will provide education and training services, and develop operation & maintenance based in Egersund

**OSM AS:**
Will contribute with ship and offshore crews, and conducts management training in offshore

EnBW at a glance

# From a traditional, integrated utility, EnBW's core business evolved into providing infrastructure and sustainable energy generation

## EnBW's strategy for achieving climate neutrality by 2035

### Smart infrastructure for customers

- Sales of electricity and gas and billing services
- Installation and sales of critical infrastructure such as broadband, charging and urban infrastructure

### System critical infrastructure

- Transmission of electricity, gas and water
- Provision of grid-related services

### Sustainable energy generation

- Generation of electricity from renewable energies
- Generation of electricity from conventional power plants, generation of heating, storage of gas, electricity and gas trading and system services

**Revenue**
€19,694.3 million

**Adjusted EBITDA**
€2,781.2 million

**Employees**
24,655

**Number of B2C and B2B customers**
Around 5.5 million

**Installed power plant output**
12,486 MW

**of which renewable energies**
4,865 MW

**Length of electricity grid**
144,000 km

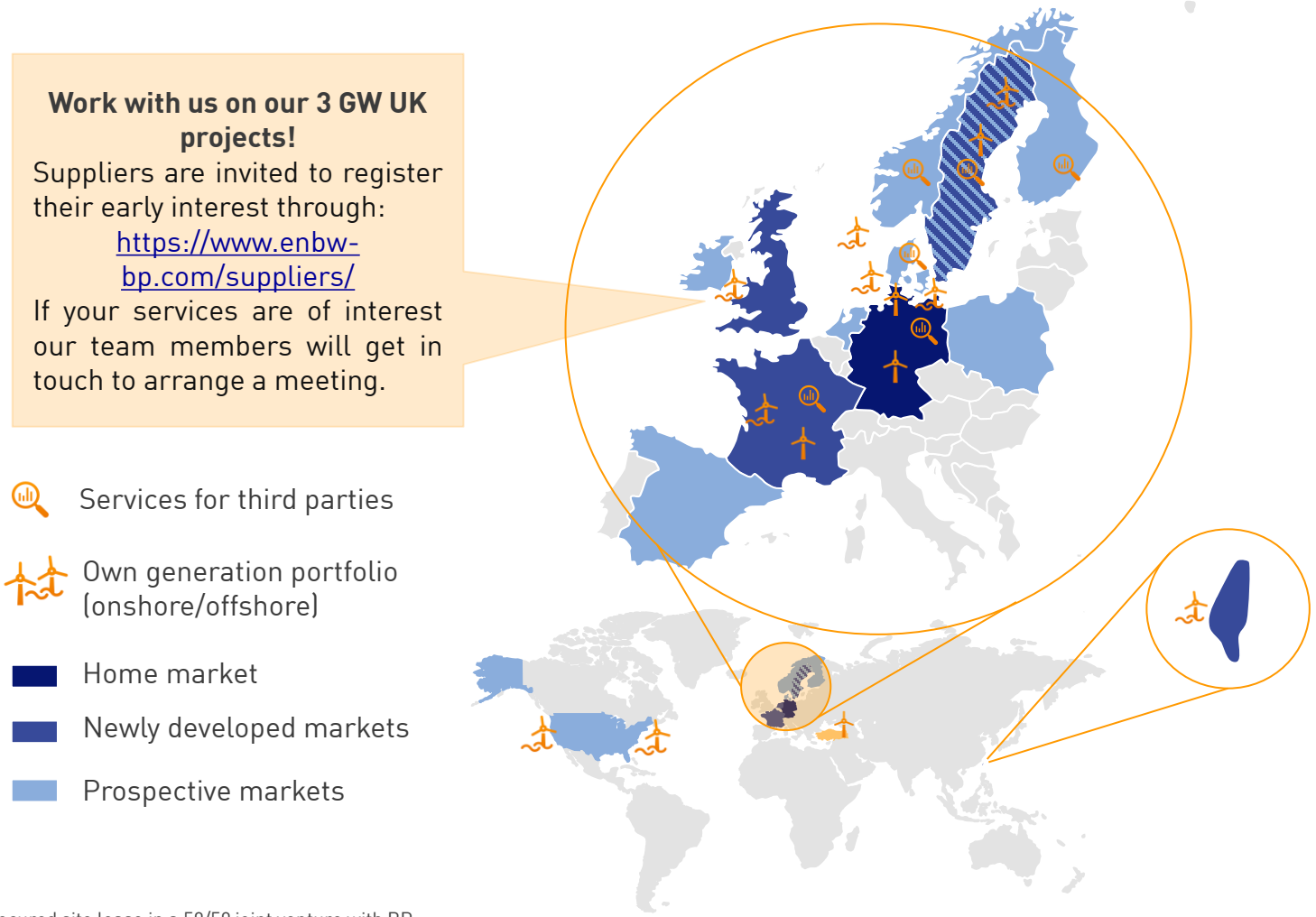
**Length of gas grid**
26,000 km

As of 31/12/2020, earnings before the investment and financial results, income taxes and amortization, adjusted for non-operating effects
Norseman Wind hybrid project

EnBW's offshore wind business

# EnBW is developing offshore wind in over 10 countries and has currently 1 GW in operation, 900 MW in advanced development and 3 GW[1] secured

**Work with us on our 3 GW UK projects!**
Suppliers are invited to register their early interest through:
https://www.enbw-bp.com/suppliers/
If your services are of interest our team members will get in touch to arrange a meeting.




## EnBW's offshore wind milestones

- The first commercial offshore wind farm in the German Baltic Sea
- Part of the Combined Grid Solution – the first hybrid project in Europe
- The largest offshore wind farm in operation in Germany
- The first auction commitment to deliver without subsidies - He Dreiht

1: secured site lease in a 50/50 joint venture with BP
Norseman Wind hybrid project

Overview hybrid project regulation

# Europe is moving ahead swiftly defining a suitable framework for hybrid projects – combining offshore wind generation and interconnector assets

**Nov. 2020:** EU Commission publishes **Offshore Renewable Energy Strategy** which includes commitments to offshore hybrid assets as a path to a meshed, offshore energy system

**By 2023:** EU Commission plans to publish **EU guidance on how to coordinate cost sharing and benefits** across borders for hybrid projects

**Europe's path towards 55% net reduction of GHG by 20230 and climate neutrality by 2050**

**Dec. 2020:** Council requests an **analysis of market arrangements of offshore bidding zones** and for the creation of an enabling framework for cross-border projects

**By 2022:** EU Commission will explore **flexibility in rules regarding allowed use of congestion rents**. Partial transfer of congestion income important to remunerate TSOs while also encouraging market-based investments

Derived from **European long-term goals**, there is a clear...

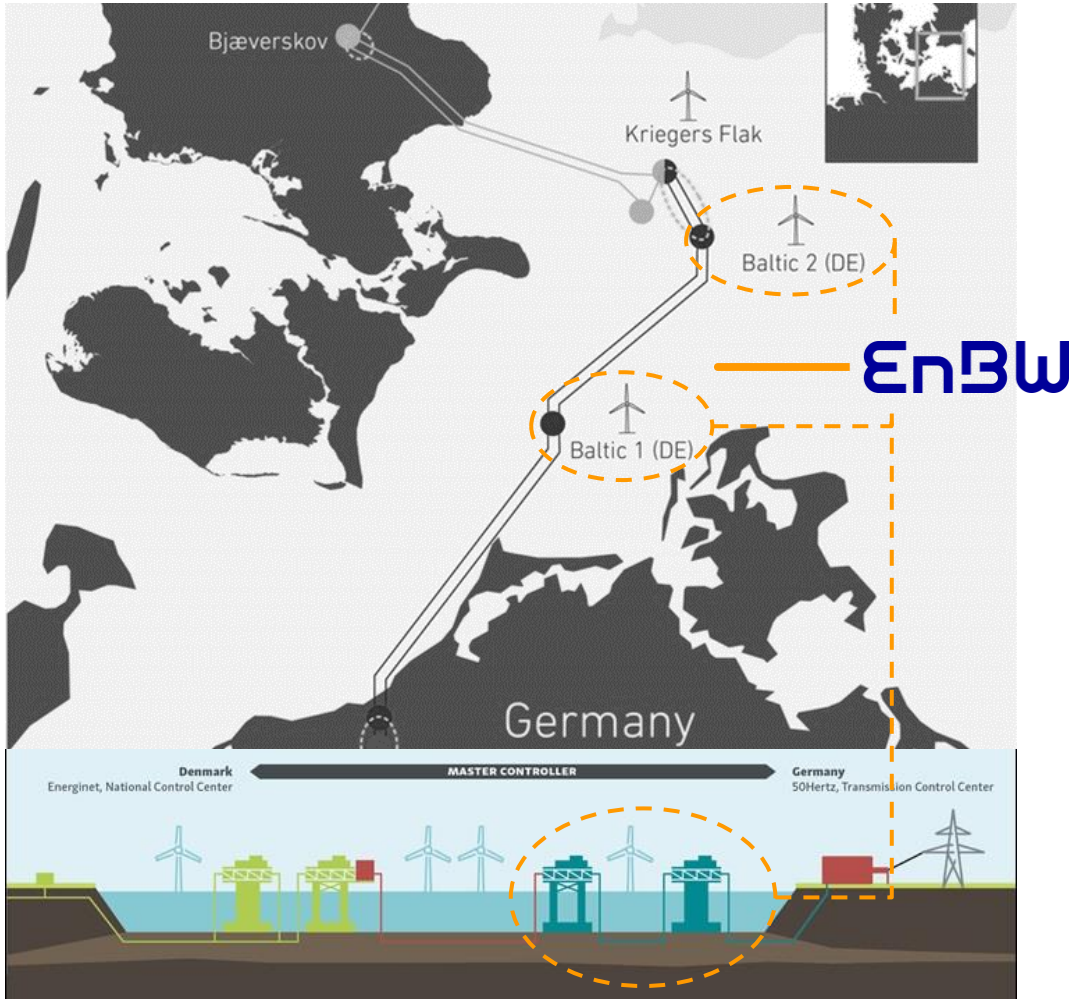

**...necessity for developing Norwegian hybrid offshore wind** as part of a mesh offshore energy system as well as ramping up green hydrogen production

Sources: BBC, EU Commission (2020). Offshore Renewable Energy Strategy, EU Council (2020)

# Being part of the world's first offshore hybrid project, EnBW could gain valuable experience for the Norseman project

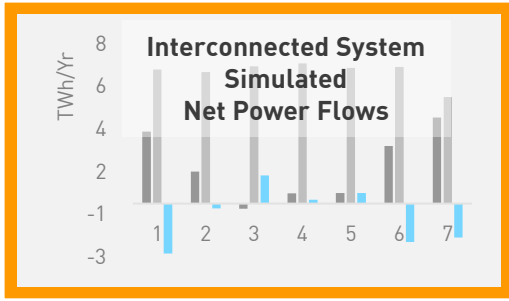
## The Combined Grid Solution

- The Combined Grid Solution connects the Danish and the German power grid via two offshore windfarms including EnBW's Baltic 2
- It is the world's first hybrid project combining grid connections to offshore wind farms with an interconnector between two countries.
- Generation capacity from all three wind farms fully used, the remaining line capacity is open for electricity trading.
- The project is exempted from 70%-EU rule but shows the need for the establishment of an enabling framework for upcoming hybrid projects.




Sources: Energinet.dk, 50Hertz

# The Norseman project combines offshore wind power generation, an inter-connector solution and prospectively innovative power to H2 production




## Viable Business Case

Based on simulations, an interconnected hybrid project provides a viable business case despite low Norwegian power prices.


## Innovative Technology

Integrating innovative technologies, e.g. offshore H2 production further supports sustainability and Norwegian ingenuity.


## Potential Connection to Germany

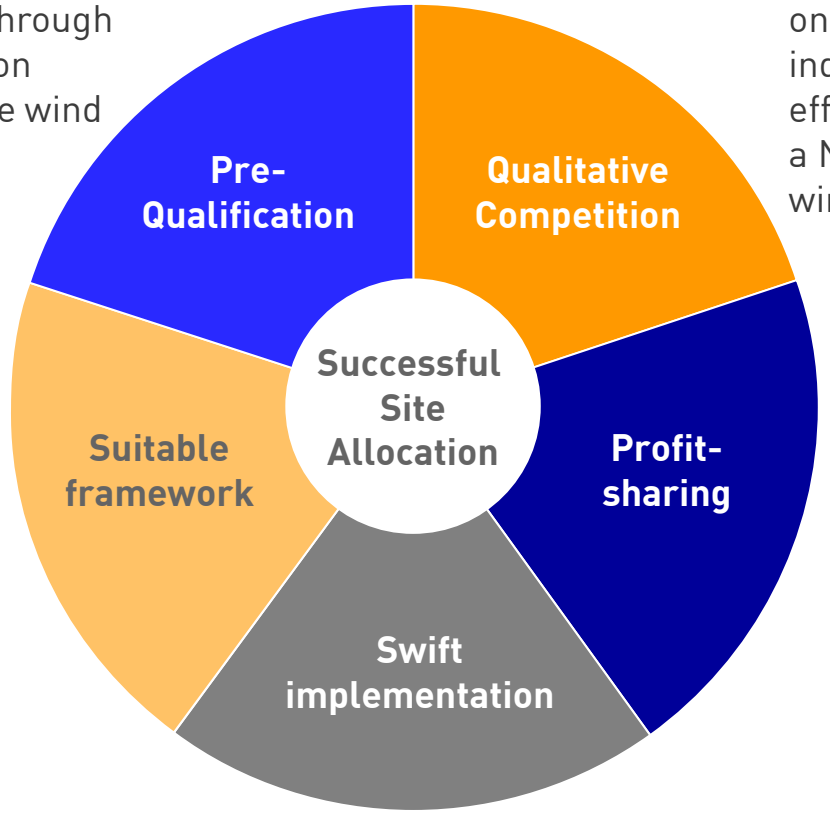
Among other options, EnBW's He Dreiht project will be further evaluated connecting Norseman to the German market

Success factors offshore wind Norway

# Setting a suitable regulatory framework, a qualitative competition for exclusive development rights would maximise socio-economic benefits

Ensuring a successful project delivery through a Pre-Qualification based on offshore wind experience

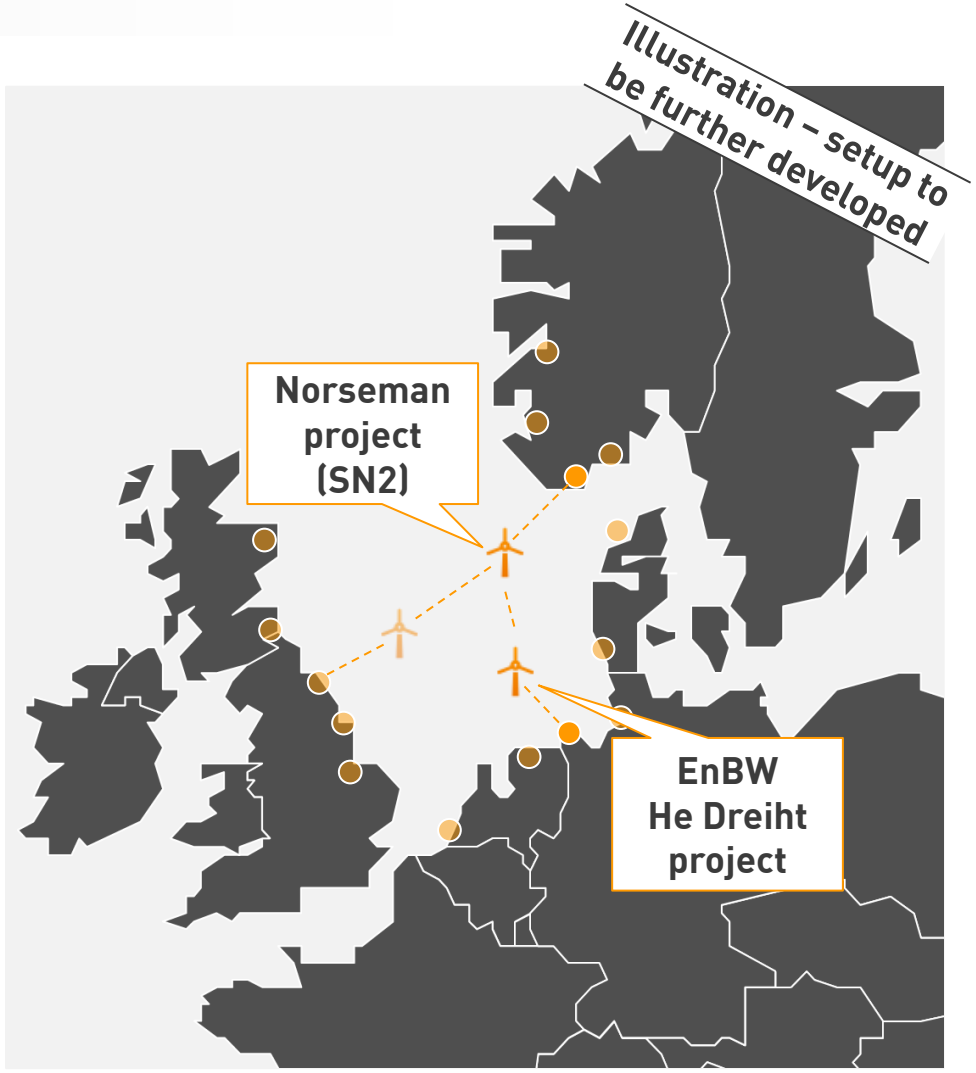
Site allocation based on value creation and industrial ripple effects kick-starting a Norwegian offshore wind supply chain




Creating a suitable regulatory framework esp. supporting hybrid project development and encouraging new technologies (e.g. H2)

Allocation of 1GW+ sites ensures economic feasibility through low LCoE which could support a profit-sharing mechanism during the operation period

Timely allocation ensuring that Norwegian offshore wind is part of the European grid and that the supply chain is ready which will also benefit the Norwegian export technology position



# Thank you!

## Also, don't miss our Norseman roadshow

**27.09. – Kristiansand**
GCE Node

**28.09. – Stavanger**
Næringsforeningen i Stavanger

**29.09. – Ålesund**
Blue Maritime