

The image is a promotional graphic for the North Sea Hydrogen Offshore Farm. It features a large, multi-colored (blue, green, and white) offshore platform structure in the center, supported by orange legs. The platform has various logos: 'HR' in a circle, 'HYS Management', 'ONP Management', and 'HY OFFSHORE'. The main text 'NORTHSEA HYDROGEN OFFSHORE FARM' is prominently displayed on the side of the platform. In the background, a vast field of white wind turbines stretches across the horizon under a cloudy sky. A large blue and white ship is visible in the distance to the right. The foreground shows the dark, choppy surface of the ocean with white-capped waves.

NORTHSEA HYDROGEN®

OFFSHORE FARM

**10MW DEMONSTRATOR PROJECT
ALPHA VENTUS**

June 2025

WHO WE ARE

HY5
Management

⚓ HY5 is a boutique management office, founded by **Andreas Wellbrock**, enabling the establishment of a hydrogen economy in the north of Germany.

ONP
Management

⚓ **Martin Rahtge** and his team at ONP have participated in the planning and realization of several offshore windfarms in Germany, like Merkur, Arcadis Ost 1, HeDreht and others.

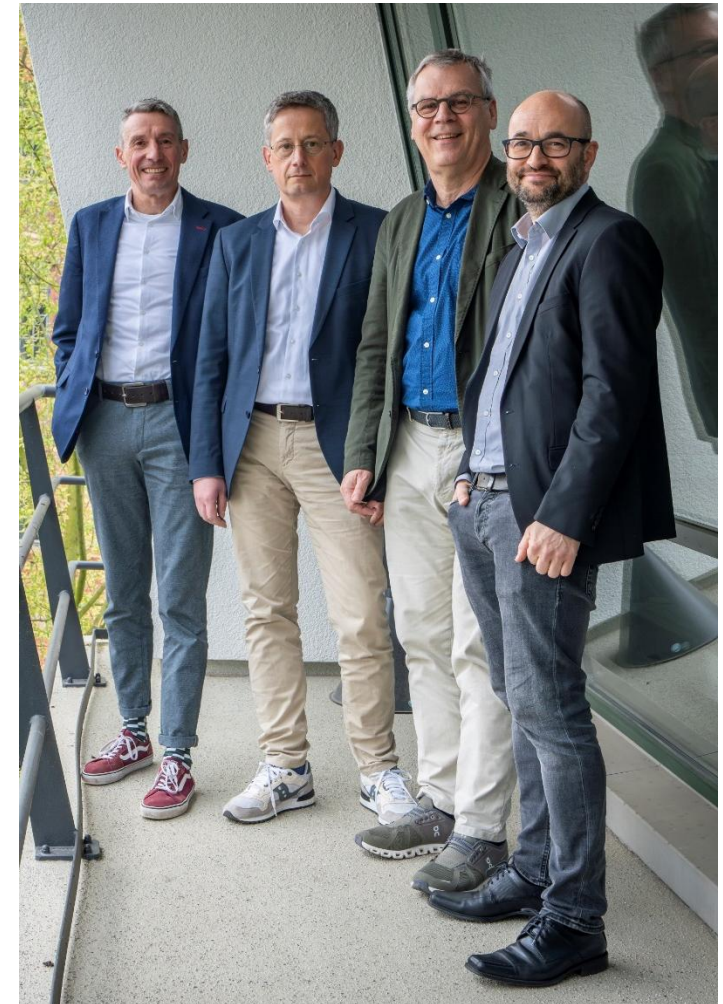


⚓ The Rönner Group, represented by **Thorsten and Marcus Rönner**, is actively driving the development of the hydrogen platform with their experts from BVT, EnPro and Lloyd-Werft.

HF OFFSHORE

⚓ **Captain Heiko Felderhoff** has established HF Offshore with a team of experienced maritime and logistics experts. They combine many years of experience in shipping and offshore operations.

NORTHSEA
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OFFSHORE FARM



INDUSTRY-RECOMMENDATION

Towards offshore hydrogen in three steps



Step 1 – Demonstrate: Pilot of offshore electrolysis

2028+

Proof of technical concept as foundation for further discussion

- Start of operation in 4 - 5 years
- At least 3 years of operation

NSH-DEMONSTRATOR



Step 2 – Improve: SEN-1 (pre-commercial scale < 1 GW)

2030s

Optimise technology and get ready for scaling

- Start of operation in 9 - 10 years
- At least 20 years of operation



Step 3 – Invest: Several Gigawatt offshore electrolysis (commercial use)

2040s

Make use of the full potential of offshore hydrogen

- At least 25 years of operation at commercial scale
- Legal inclusion of mixed connection concepts

OUR CONCEPT

- ⚓ Demonstration project to prove the **feasibility of H2 production** in harsh offshore environment
- ⚓ **Self sufficient and autonomous** platform
- ⚓ **Scalable Modular design** to implement at larger projects
- ⚓ Deployment within **existing OWF** for power supply and operational support

What we can achieve:

- ✓ A **proof of concept** including **ecological compatibility**
- ✓ **Performance data of Electrolysis** process coupled with fluctuating renewable energy
- ✓ **Compatibility assessment of auxiliary equipment** such as compressor and desalination plant with electrolyzers under fluctuating electricity and offshore environment
- ✓ Investigation of **offshore PV-power** to improve the business case and reduce platform-sizes
- ✓ **Visibility** for Offshore-H2-production and involved **industry partners**, paving the way to large scale projects

DEVELOPMENT TIMELINE

2021 ■ ■ ■ 2024 ■ 2025 ■ 2026 ■ 2027 ■ 2028 ■ 2029 ■ 2030 ►



Site allocation



Project-FID



Hydrogen production



Dismantling

ASSOCIATED RESEARCH PROJECTS

Wind2Hydrogen - University of Bremen (IALB) and University of Applied Sciences Bremerhaven - HR as partner / NorthH2 as associated partner

- ⚓ Modelling of all required sub-systems for offshore hydrogen production
- ⚓ static simulation of the isolated grid-structure at sea
- ⚓ dynamic research of interaction between sub-systems
- ⚓ Definition of technical risks during offshore operation
- ⚓ Economics of Offshore Hydrogen Production



**Hochschule
Bremerhaven**

MeerH2 - University of Bremen, Field of Advanced Ceramics und Field of Technical Thermodynamics - NorthH2 as associated partner

- ⚓ Optimization of seawater desalination and brine management for offshore hydrogen production
- ⚓ MeerH2:MemMat: Membrane materials - Development of ceramic membranes
- ⚓ MeerH2:MemDes: Membrane distillation - Process and system development
- ⚓ Simulation of membrane performance

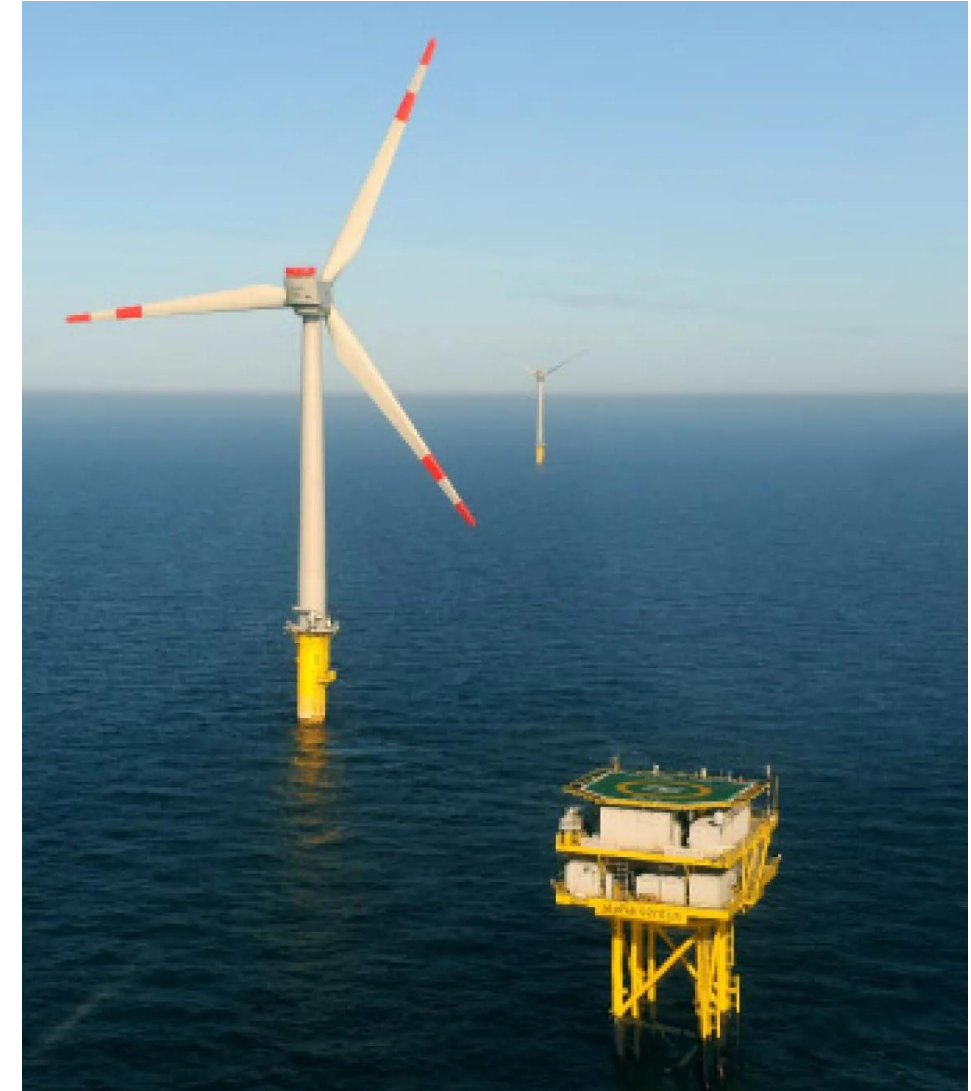
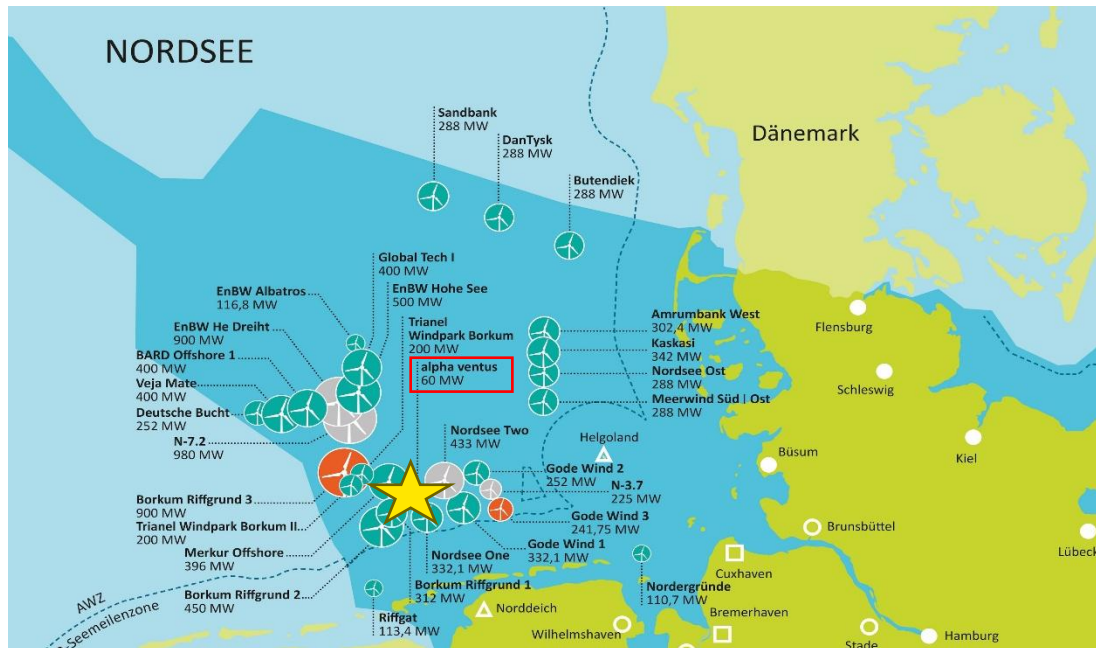


CONCEPT: NSH- DEMONSTRATOR

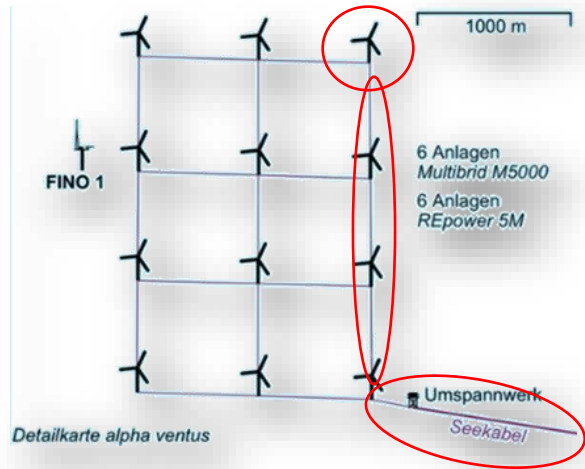


PROJECT LOCATION

- ⚓ Positioning of Demonstrator-Platform within **OWF Alpha Ventus**
- ⚓ Utilization of **existing infrastructure** (foundation, cables, SCADA), as well as safety zone and sea surveillance
- ⚓ Usage of **existing offshore O&M-logistics** (CTV and technicians)
- ⚓ **Power-Supply** from Windfarm **via AV-Substation** (OSS)



H2-DEMONSTRATOR - ALPHA VENTUS



Substation



Foundation

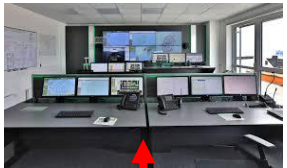


O&M-Logistics



**Inner-Array
Cables /SCADA**

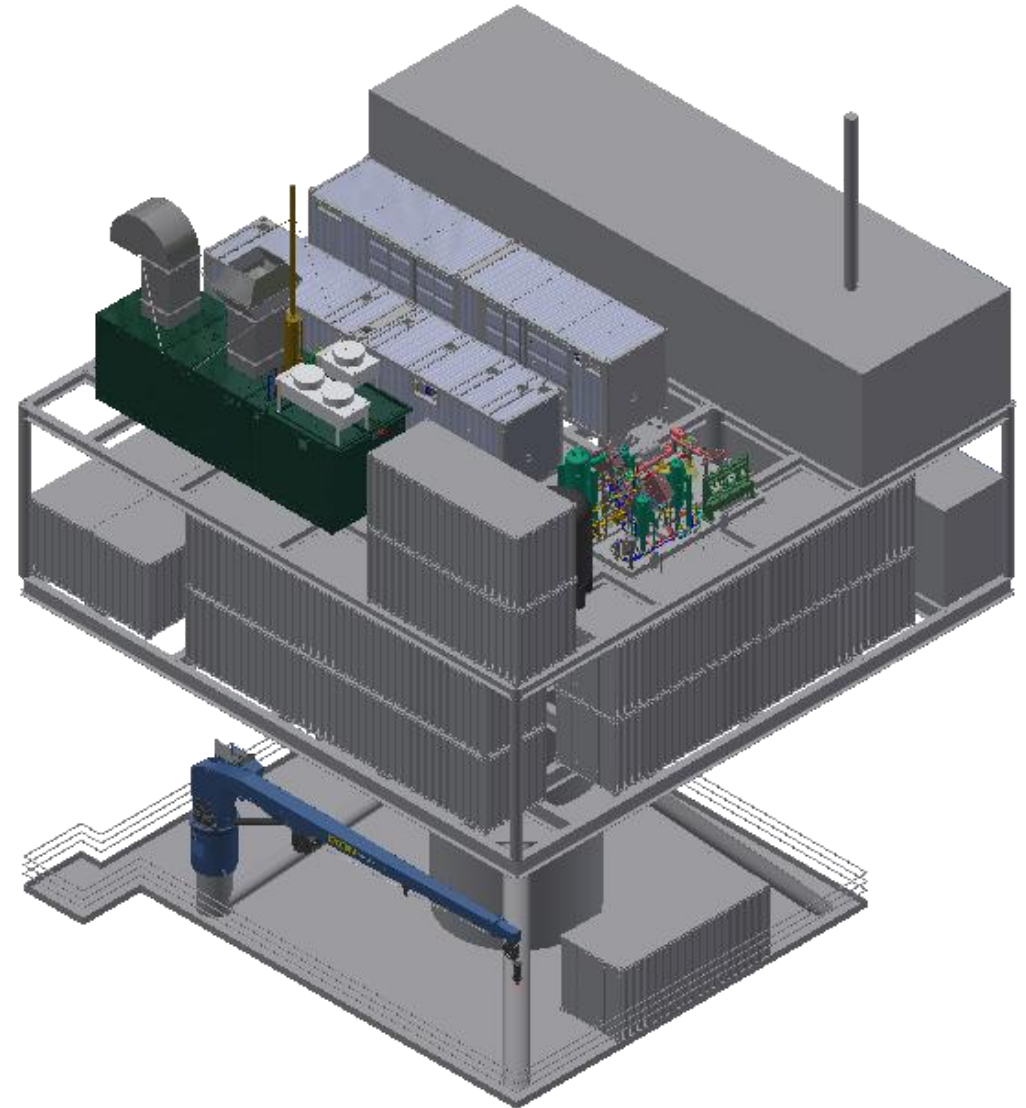
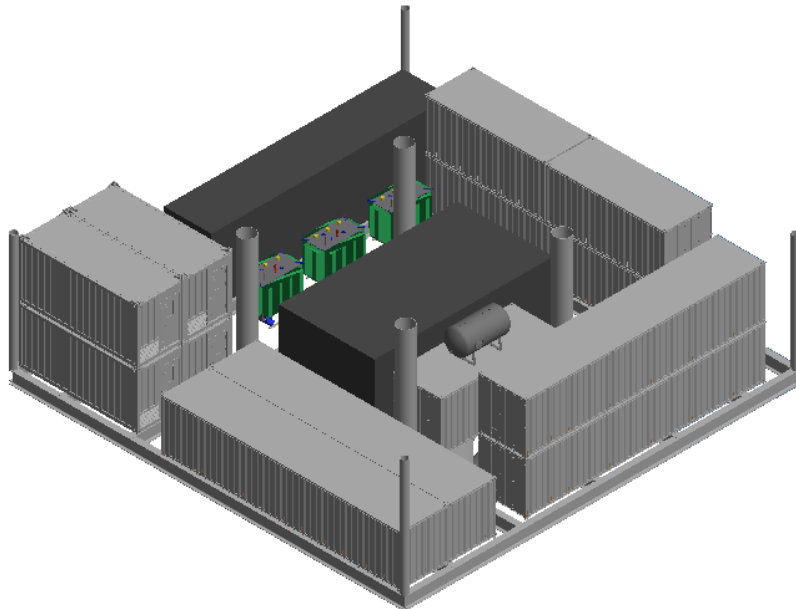
**Onshore Control
Room**



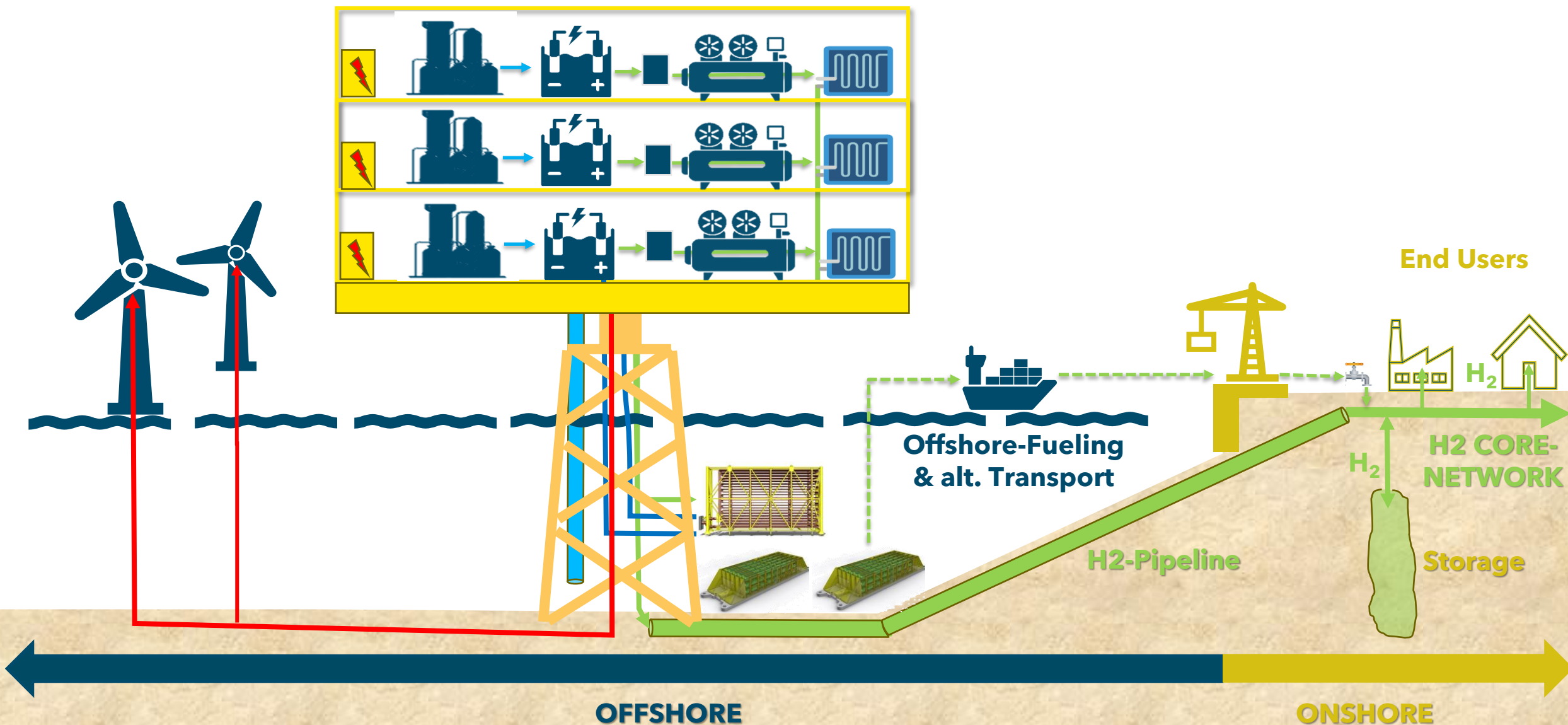
**Export Cables
SCADA**

H2-PLATFORM DESIGN

- ⚓ Uniform support grid
- ⚓ Simple realization of foundations at any position
- ⚓ Flexible utilization of the area
- ⚓ Dimensions: 20m x 20m x 18m
- ⚓ Total weight: ca. **850to**



COMMERZIALIZING OFFSHORE ELECTROLYSIS



**THE HYDROGEN FUTURE
STARTS NOW!**

WHAT'S IN IT FOR YOU?

LET'S TALK!

**NORTHSEA
HYDROGEN®**
OFFSHORE FARM



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