

HYDROGEN HIGHWAY TIL EUROPA?

ENERGISKIFTET, 8. MARS 2023

Trude Sundset, Aker Horizons



AKER
HORIZONS



This is Aker Horizons

Planet-positive developer of green energy and green industry

2020
Established July 2020

Global reach
18 countries & 5 continents

AKH.OSE
Listed on OSE

NOK 23.4 bn
GAV as per Q2 2022

1,200
Employees across portfolio

Aker ASA
Majority owner (67%)

Current focus

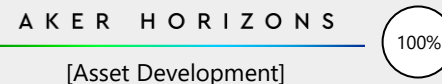
Renewables, carbon capture & hydrogen

Active owner of sector-leading companies driving decarbonization



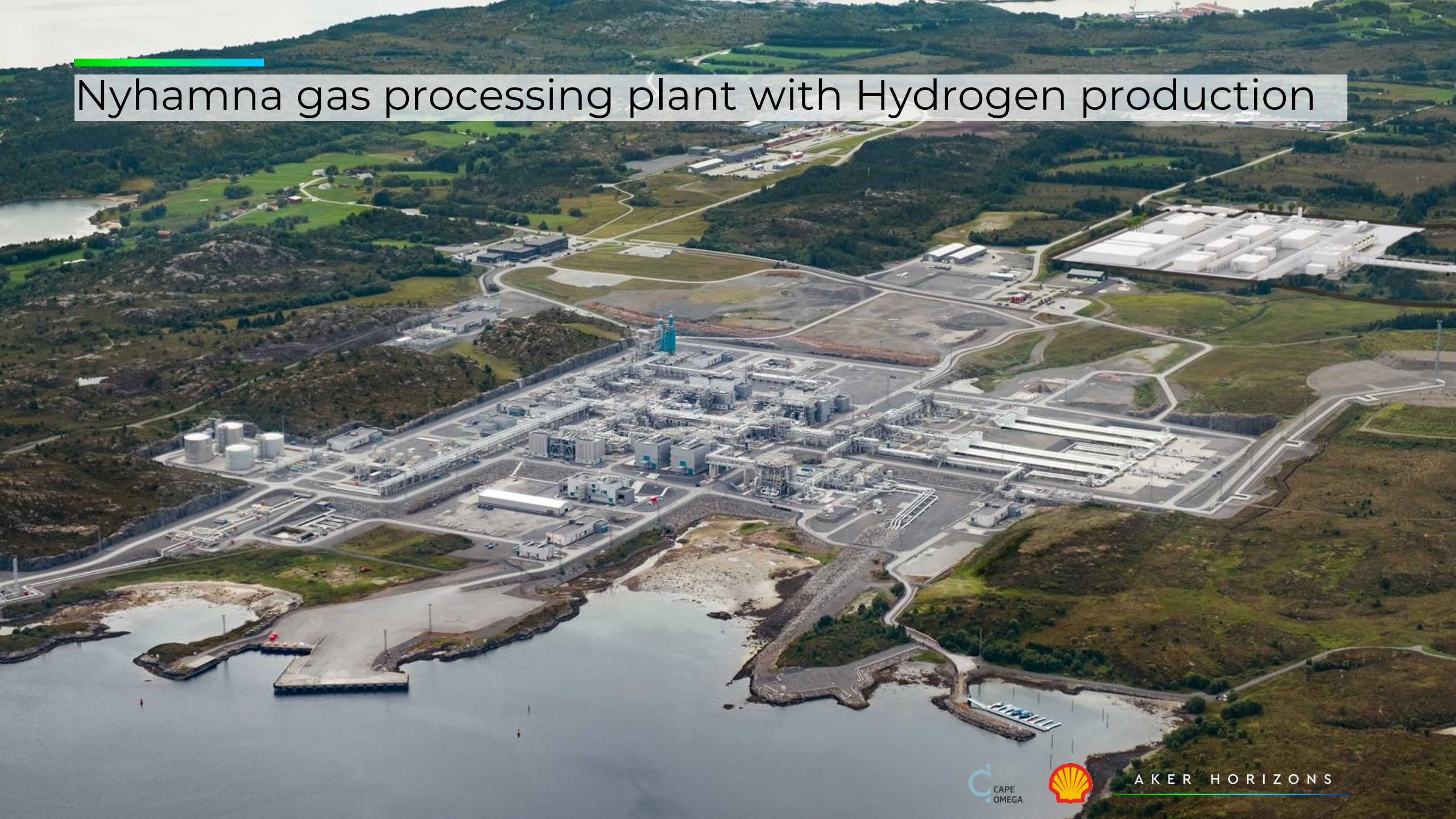
Developer of industrial-scale decarbonization projects

Portfolio by ownership





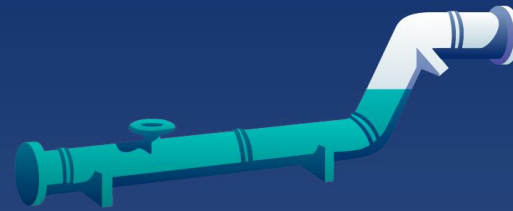
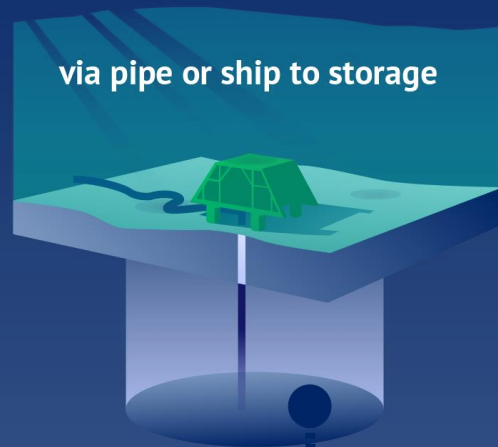
Nyhamna gas processing plant with Hydrogen production





AKER HORIZONS

Feasibility study 2022-23



CO₂

H₂

Hydrogen Plant
with CO₂ Capture

Natural Gas



Nyhamna
Gas Terminal

Net Carbon Footprint and Carbon Intensity Ambitions

Some target setting exists

- EU low carbon H₂ product target is 3 kg CO₂eq/kg H₂ for low carbon H₂
- Same values used by The World Business Council for Sustainable Development (WBCSD)

Carbon full value chain Carbon Intensity

- Currently estimated below 3 kg CO₂eq/kg
- Even lower CI might be achieved, but technic-economic benefits have to be established.

Basis and Assumptions for value chain

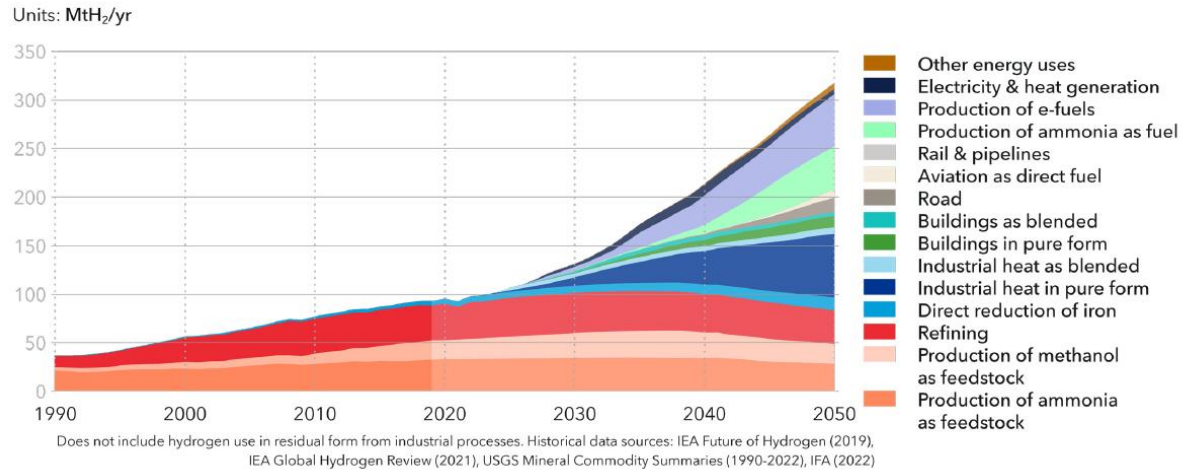
- Aukra calculations include Scope 1, 2 and 3
- Assuming delivery in continental Europe
- CO₂ capture (CC) rate is >95%
- Power source is assuming average Norwegian Power Grid Intensity



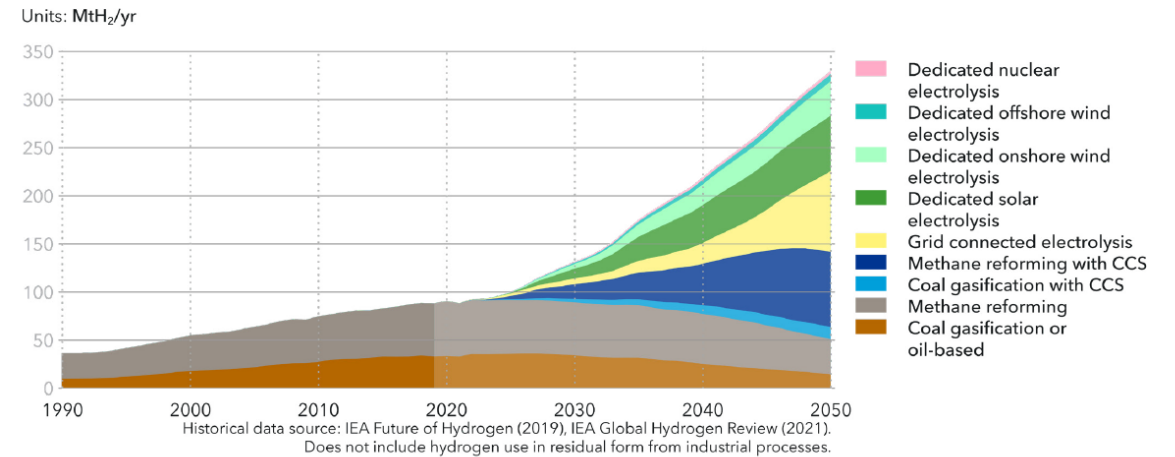
Hydrogen value chains are developing globally at a fast pace

All values in Mt/year

Global hydrogen demand by sector



World hydrogen production by production route



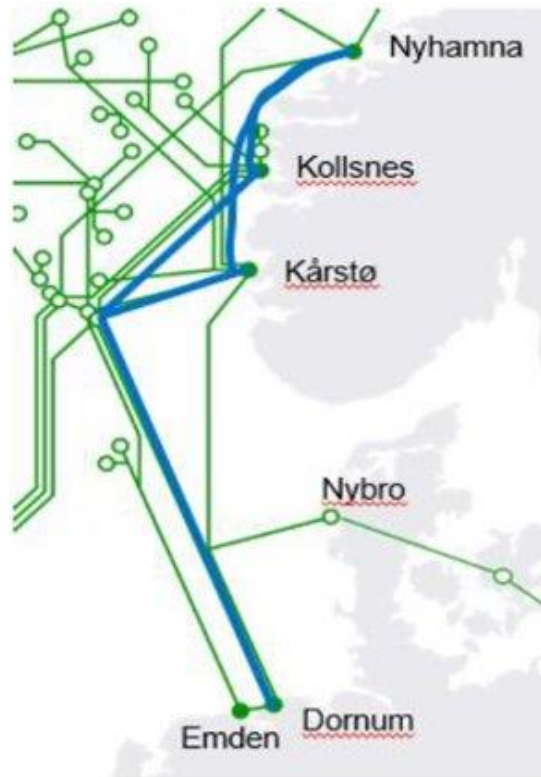
- ✓ Majority of the demand to pick-up after 2030
- ✓ Use of hydrogen as an industrial fuel and feedstock could be the major demand source, apart from the traditional demand from the fertilizer and refinery industry.
- ✓ Production of e-fuels using hydrogen could help decarbonize the shipping and the aviation segment.

- ✓ Production of grey and black hydrogen produced from unabated natural gas and coal gasification to decline in a carbon constrained world.
- ✓ Production of hydrogen from renewable energy resources and grid electricity to pick up in the later part of the next decade.
- ✓ Blue hydrogen to play an integral role in the hydrogen economy by acting as a transition agent from grey to green and facilitating demand side modifications.

Large European demand for Hydrogen from Norway

Joint Statement Germany – Norway, 17 March 2022 + 5 January 2023

- Joint Feasibility of Hydrogen Pipeline from Norway to Germany
- Aker Horizons, Shell and CapeOmega sponsors
- Pipeline export Base Case for the Aukra project



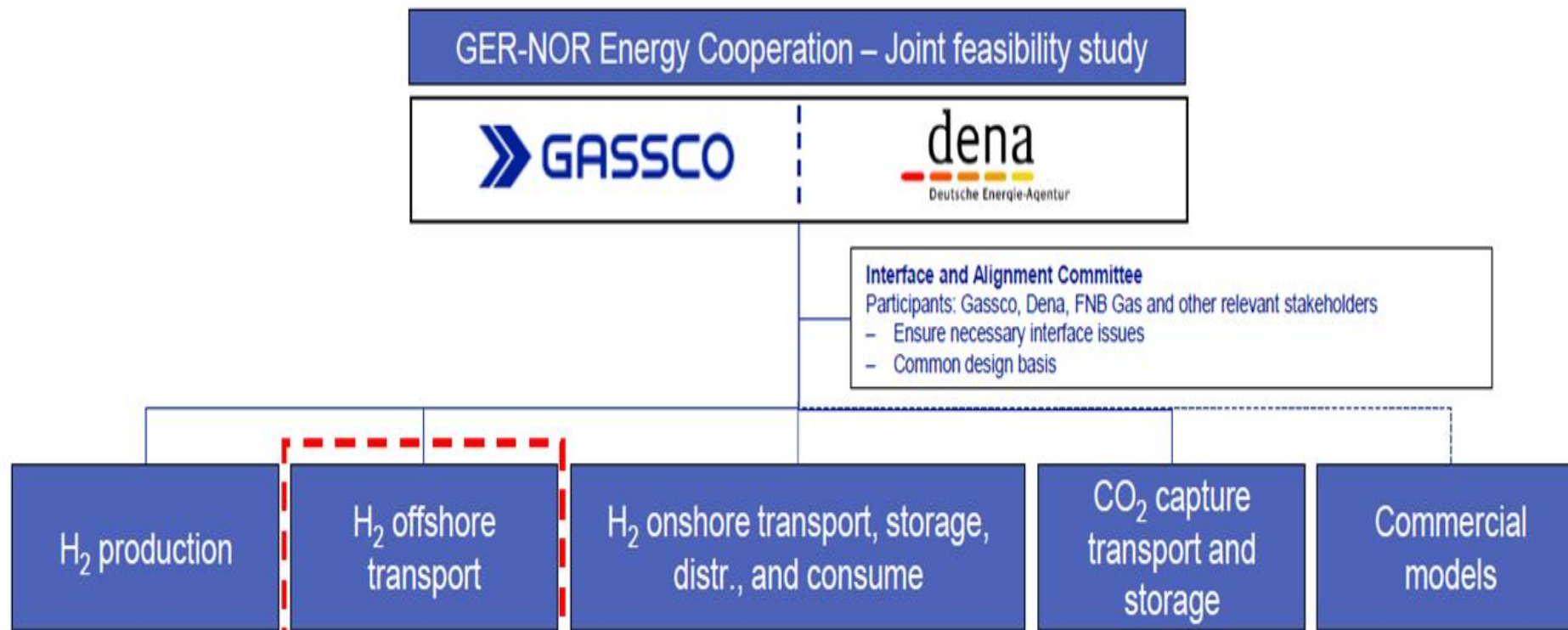
Source: Gassco



Source: NTB

GER-NOR Energy Cooperation – Joint feasibility study

– Organisation and SoW overview



Source: Gassco

Timeline

2021-2025

Project matured to final investment decision

2029-2030

Project commissioned and commercially operational exporting low-carbon hydrogen to Europe

2035+

Additional renewable hydrogen production is commissioned, doubling export capacity



AKER HORIZONS

Kan vi dekarbonisere Europa fra Aukra?

Kan vi bygge en Hydrogen Highway til Europa?

**Vi kan i hvert fall bidra til en god start
og være en utløsende faktor!**

