



The Hydrogen Industry in Northern Germany and Niedersachsen Making the Energy Transition a Reality



Green Hydrogen in Niedersachsen

Niedersachsen is committed to the global and national climate protection goals. If greenhouse gases are to be reduced sustainably, the energy revolution must be implemented in all sectors (electricity, transport, heating and industrial).

Developing a hydrogen industry is a key element in the process towards achieving the climate policy goals.



Hydrogen Strategy of the Northern German Coastal States



On 7 November 2019 the Minister of Economic Affairs and the senators of the German states of Bremen, Hamburg, Mecklenburg-Vorpommern, Niedersachsen and Schleswig-Holstein jointly approved the

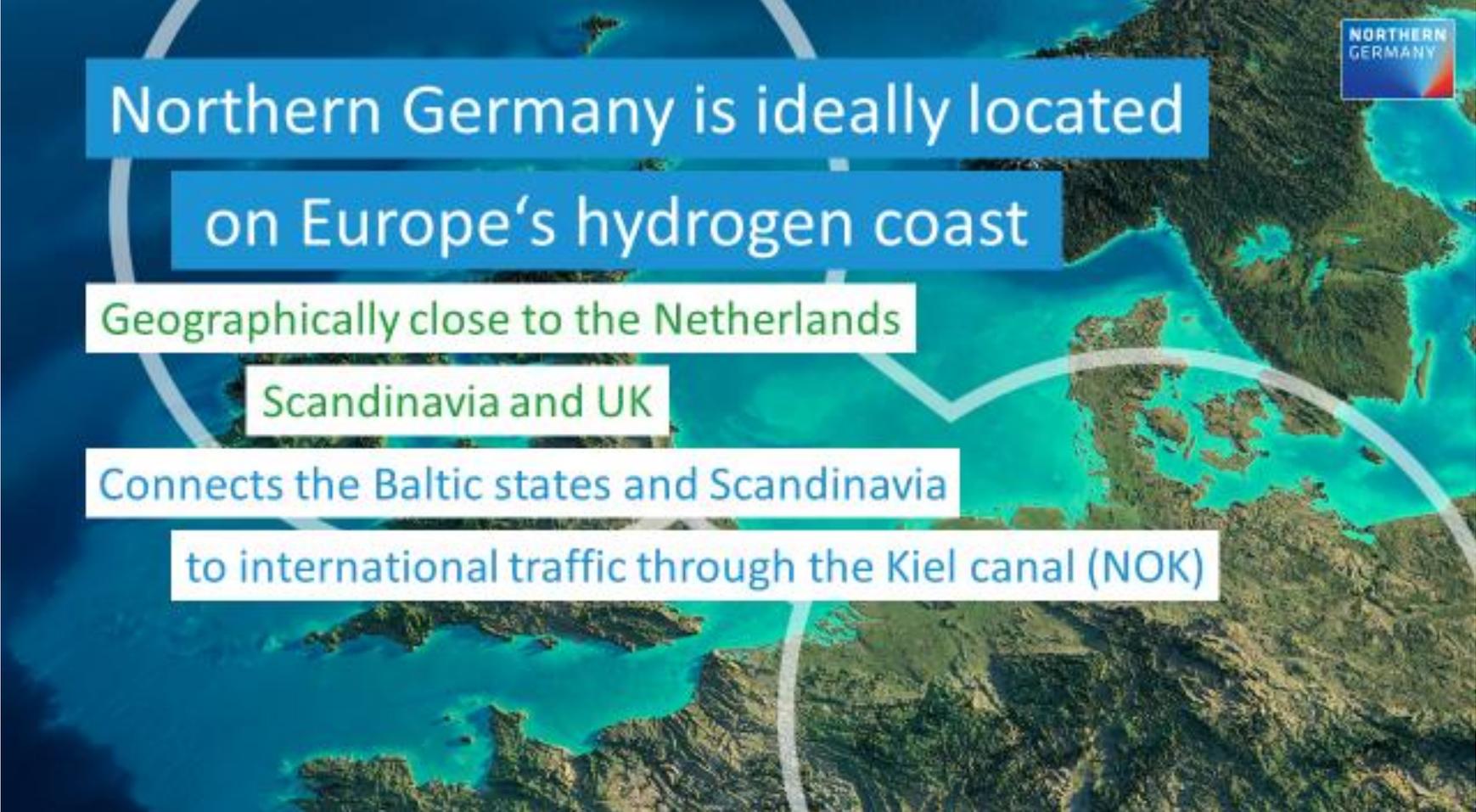
Northern German hydrogen strategy.

Interdisciplinary working groups from business, science and the public services were set up to implement the fields of action.

HY 5 – International Marketing Campaign



HY 5 – Northern Germany

A satellite-style map of Northern Germany and the surrounding North Sea region. The map is overlaid with several text boxes and a circular graphic element. The text boxes highlight the region's strategic location for hydrogen infrastructure. A small logo in the top right corner reads 'NORTHERN GERMANY'.

Northern Germany is ideally located
on Europe's hydrogen coast

Geographically close to the Netherlands

Scandinavia and UK

Connects the Baltic states and Scandinavia

to international traffic through the Kiel canal (NOK)

HY 5 – Northern Germany



We are turning
into Europe's powerhouse
20 high-performance power-to-gas facilities (in operation/planned)
massive expansion of electrolysis capacities

NORTHERN GERMANY

HY 5 – Northern Germany



Strong customers in

in key sectors/industries

Steel industry

Maritime economy

Mechanical engineering Industry

Logistics

Automotive industry

Aviation industry

Chemical industry

Food industry

Life sciences

HY 5 – Northern Germany



Northern Germany is

Europe's logistics hub

Excellent port, modal and logistics infrastructure

more than a dozen seaports with logistics and import terminals

Wilhelmshaven, Hamburg and Bremen as large universal ports

the Kiel Canal as the most frequented artificial seaway in the world

Important Project of Common European Interest (IPCEI) in Northern Germany

About **50%** of all selected german **IPCEI Projects** are located in the **five** northern german **coastal federal states** with **9 billion Euro** funding volume



Important Project of Common European Interest (IPCEI) in Niedersachsen

- **Green methanol MeOH** – synthetic Methanol (DOW Chemical)
- **Get H2** – Generation, Pipeline, DRI (e.g. RWE, OGE, Salzgitter AG)
- **Clean Hydrogen Coastline** – Generation, Storage, DRI (e.g. EWE, Arcelor)
- **WIPLIN** – CO2 free Aviation (Airbus)
- **Green Crane** – Hydrogen Import by LOHC (e.g. Hydrogenious)
- **LGH2** – synthetic Fuels (BP, Orsted)
- **Hyperlink** – Pipeline European Hydrogen Backbone (Gasunie)

Potential of Hydrogen Industry in Niedersachsen

As an “**Energy State**” and “**Mobility State**”, Niedersachsen ideally combines the production of regenerative hydrogen and its use in vehicles - on water, on land and in the air - as well as in the industry.



Companies, suppliers, energy providers and **research institutions** in Niedersachsen are co-operating to develop the climate-friendly and technology-neutral mobility, production and energy supply of tomorrow.

This is why Niedersachsen lends itself so well to establishing a **hydrogen-based Economy**

- **High generation capacities** for onshore and offshore wind power with further development potential
- **Underground strata for storing hydrogen** in large quantities
- **Sea ports**, which will play a significant role in future in the **import and distribution of green hydrogen and synthetic energy carriers**, in the use of hydrogen and in the export of hydrogen technologies and components



Coradia iLint potential CO₂ reduction in rail travel with hydrogen-powered train

In 2016 ALSTOM in Salzgitter presented the world's first hydrogen train. A pair of trains was trialled for a year and a half between Buxtehude and Cuxhaven until May 2020. Regular service is set to follow in 2022.



Source: ALSTOM

SALCOS - Steel generation using hydrogen at Salzgitter AG

Salzgitter AG generates hydrogen in a high-temperature electrolysis facility. Replacing coke with green hydrogen will lead to a considerable reduction in CO₂ emissions in steel production in the future.



Source: Salzgitter AG

Waste disposal with hydrogen vehicles by Faun

Faun has developed an alternative engine concept for waste collection vehicles and street sweepers: Faun BluePower combines the battery and fuel cell engine, thus successfully reducing harmful emissions.



Source: FAUN

e-Gas and e-Cerosine Production in Werlte

ela Industriegas GmbH produces synthetic gas from regenerative power and to this end manufactures green hydrogen in a six-megawatt electrolysis facility. The EWE biogas plant supplies CO₂ for the methanation of the hydrogen.

Since October 2021 the Atmosfair GmbH produce e-cerosine at this location to reduce CO₂ emissions in the aviation.



Source: EWE

Hydrogen R&D in Niedersachsen

For Niedersachsen, hydrogen technology offers a special strategic opportunity due to the highly specialized, very well networked **research landscape** and the local economy.



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efzn

Energie-Forschungszentrum
Niedersachsen

CARL
VON
OSSIETZKY
universität OLDENBURG

1 2
10 4
100 4
Leibniz
Universität
Hannover

Technische
Universität
Braunschweig

TU Clausthal

GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN



Research on hydrogen technologies is a focus at the **Energy Research Center Niedersachsen**. The EFZN is a joint scientific center of the universities of Braunschweig, Clausthal, Göttingen, Hannover and Oldenburg.

Hydrogen in Niedersachsen



Caption

- Seaport
- Airport
- Motorway
- River/canal
- Filling station
- Planned filling station
- Cavern storage
- Power to gas facility
- Research and development institution
- University and non-university institution
- State institutions, clusters and regional network
- Hydrogen technology provider
- HyLand project
- IPCEI hydrogen projects (Important Project of Common European Interest)
- Other hydrogen project

Thank you for your attention!

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<https://www.invest-in-niedersachsen.com/hydrogen>

<https://www.hy-5.org>