

Niedersachsen Ministry of Economic Affairs,
Employment, Transport and Digitalisation



Hydrogen. Energy of the Future in Niedersachsen

Invest in



Niedersachsen





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“Here in Niedersachsen, we have everything for a successful hydrogen economy: wind for the production of green hydrogen, experienced researchers, industrial users and, of course, the ports which play an important role for import and export.”

Dr Bernd Althusmann

Niedersachsen Minister for Economic Affairs,
Labour, Transport and Digitalisation

Hydrogen in Niedersachsen





Caption

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

Perfect conditions for hydrogen economy in Niedersachsen

Niedersachsen already supplies

20 %

of the green electricity produced in Germany – as a basis for producing green hydrogen



Expansion potential of around 8 GW by 2030 for onshore wind and 22 GW offshore



40 %

of the European cavern storage is located in Niedersachsen

More than

20



Research institutes from 6 universities and non-university institutions are working on solutions for decarbonisation with hydrogen

8



Major hydrogen projects as part of the "Important Projects of Common European Interest" programme

9

Seaports for the import and distribution of hydrogen



Nearly

90 %

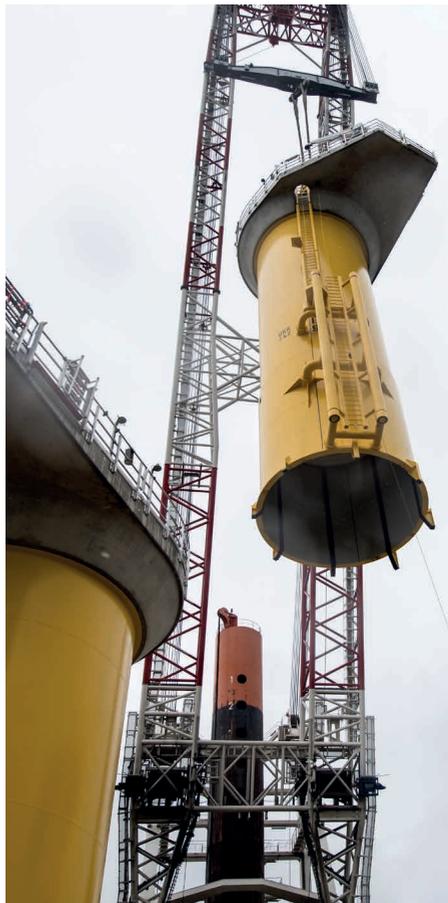
of gross electricity consumption in Niedersachsen from renewable energy sources

We welcome you to be successful in Germany's No. 1 energy state!

If your company wants to benefit from the current developments in the German energy transition, Niedersachsen is your ideal location. We have consistently expanded renewable energies and established high-performance energy research. Niedersachsen is therefore in a perfect position to make the energy transition a reality.

How can we support you?

- **Market research:** We are happy to help you better understand the current market.
- **Site search:** We help you find the perfect commercial and industrial sites.
- **Arranging contacts and networks:** We can help you quickly build up a network in the North of Germany.
- **Funding advice:** The Investment and Development Bank of Niedersachsen, NBank, is glad to provide you with advice and to discuss funding options with you.



Our contact partner is glad to discuss your options with you:

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Niedersachsen – The perfect location for a hydrogen economy

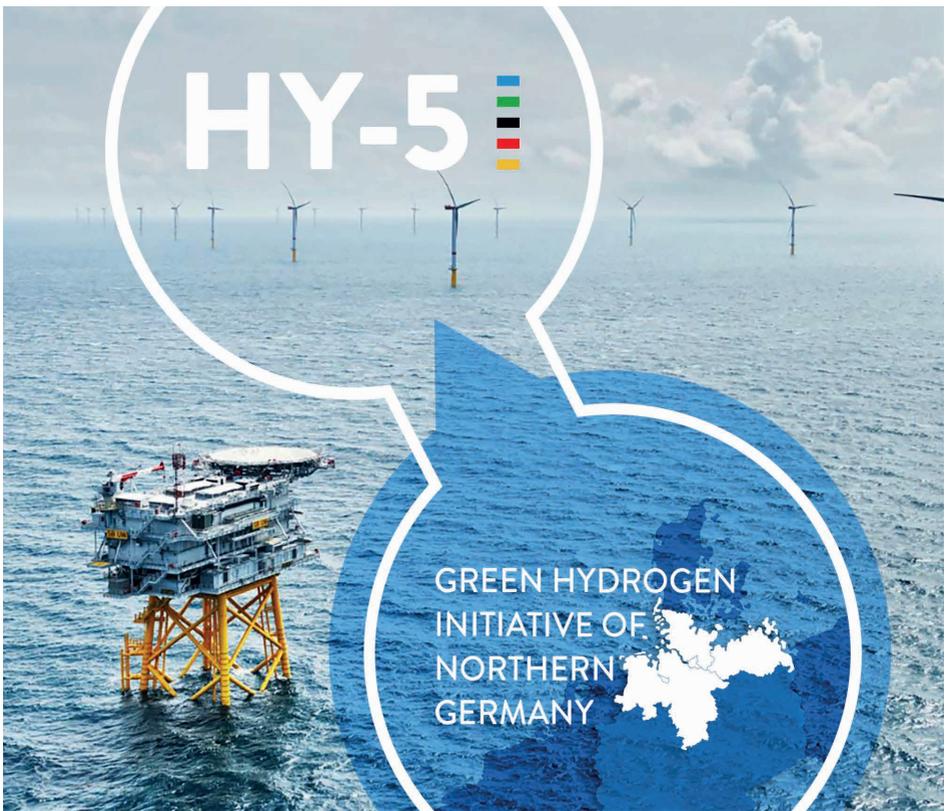
Niedersachsen is committed to global and national climate protection goals and is a driver of the German energy transition. Niedersachsen also offers an above-average share of renewable electricity. Already today, wind energy, biomass and solar plants cover almost 90 percent of the electricity consumption in the state – and more and more are coming into use. In addition, there is considerable potential for expansion; especially in onshore and offshore wind energy as well as solar energy.



Why is Niedersachsen the perfect place for the development of a hydrogen economy?

Niedersachsen offers further unique selling points that are necessary for the development of a comprehensive hydrogen economy.

- Seaports, which play a key role in the import and distribution of green hydrogen and synthetic energy carriers
- Underground caverns for the storage of hydrogen in large quantities
- High level of scientific expertise: More than 20 research institutes from 6 universities and non-university institutions are working on solutions for the decarbonisation with hydrogen
- Industries with applications for hydrogen: Manufacturers of road and rail vehicles, ships and aircraft, steel producers and chemical industry
- Commercial and industrial areas with ideal logistics infrastructure
- Companies with experience in hydrogen, solutions and marketable products
- Company networks, in order to quickly make contact with cooperation partners, suppliers and potential customers



The German states of Bremen, Hamburg, Mecklenburg-Vorpommern, Niedersachsen and Schleswig-Holstein jointly decided on the "Hydrogen Strategy for North Germany".

The cooperation of the economic development agencies under the name HY-5 will make northern Germany the strongest future region for green hydrogen in the heart of Europe.

It is particularly important to develop and complete the value chain for green

hydrogen and to create synergies across the German states in the areas of hydrogen production and infrastructure and location marketing.

Together, the German states want to contribute to establishing Northern Germany on the European map as one of the leading hydrogen regions.



For more information:

www.hy-5.org/en

Successful hydrogen projects in Niedersachsen

Niedersachsen not only has sufficient renewable electricity, the basic condition for the production of green hydrogen, but also has numerous companies in the field of application and technological implementation for using hydrogen in the mobility, industrial and heating sectors. Products and projects are already being successfully implemented in Niedersachsen. Some examples:

Waste disposal with hydrogen vehicles by Faun

Faun developed an alternative drive concept for waste collection vehicles and sweepers: Faun BluePower combines battery and fuel cell propulsion, successfully reducing pollutant emissions.



Get H₂

The IPCEI project is building the first publicly accessible hydrogen infrastructure. A pipeline network connects the production of green hydrogen in Lingen with industrial consumers in Niedersachsen and North Rhine-Westphalia. This creates the basis for a hydrogen economy in Germany.

Hyways for Future

Together with businesses, politicians and the population, the energy company EWE wants to create an emission-free supply of green hydrogen for transport in the Northwest metropolitan region and Northern Germany by combining the sectors of industry, energy and transport. The hydrogen model region focuses on the cities of Oldenburg, Bremen, Wilhelmshaven, Bremerhaven and Cuxhaven.



SALCOS® - Stahlerzeugung mit Wasserstoff bei der Salzgitter AG

With SALCOS® (Salzgitter Low CO₂ Steel-making), Salzgitter AG pursues the goal of directly avoiding CO₂ emissions in steel production. The core is the conversion of steel production from blast furnaces to hydrogen-based direct reduction in order to reduce CO₂ emissions by more than 95%.



Coradia iLint – CO₂ savings potential in rail transport with hydrogen trains

In 2016, ALSTOM Salzgitter presented the world's first hydrogen train. A train pair was in test operation for one and a half years between Buxtehude and Cuxhaven until May 2020. Scheduled operations will start in 2022 with 14 Coradia iLint series trains, which will replace the diesel units previously used in the Weser-Elbe network.



Hydrogen Campus Salzgitter

The "Hydrogen Campus Salzgitter" project aims at a close networking of stakeholders and activities from industry and science in the region and thus ensures the transfer of knowledge and technology to industry, science, politics and society.



For more information:

www.faun.com/en

www.get-h2.de/en

www.hyways-for-future.de

<https://salcos.salzgitter-ag.com/en>

<https://www.alstom.com/solutions/rolling-stock/coradia-ilintm-worlds-1st-hydrogen-powered-train>

Research and development
on all aspects of hydrogen



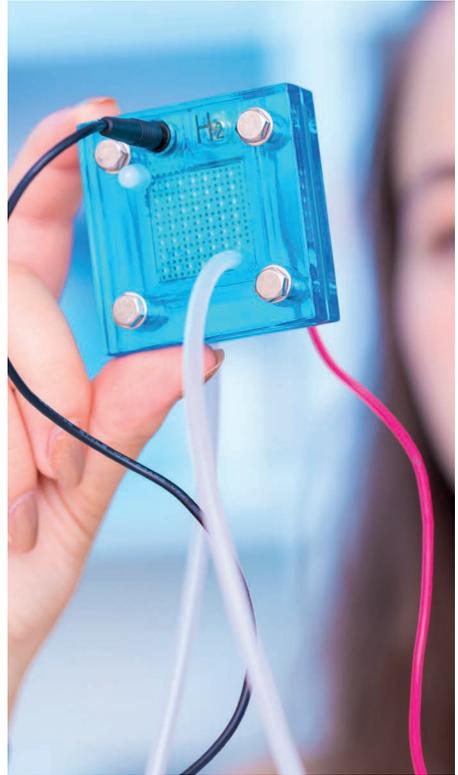
Researchers in Niedersachsen have many years of experience in the field of hydrogen research and are very well networked with each other:

In the **Energy Research Center Niedersachsen** (EFZN), the hydrogen activities of more than 20 university and non-university research institutes are bundled in the Research Association Hydrogen Niedersachsen. Niedersachsen can thus benefit from a competent network with experienced scientists.

The spectrum of hydrogen research at the EFZN ranges from supply and storage to application.

The areas of expertise and focus of hydrogen research of scientists active in the EFZN in Niedersachsen are:

- Water electrolysis for the production of hydrogen
- Underground hydrogen storage in geological formations
- Fuel cells and fuel cell systems
- Technical H₂ combustion for energy recovery in thermal fluid energy machines



- Conversion of hydrogen into other energy carriers
- Energy system analysis with special focus on hydrogen
- Concepts for the integration of hydrogen into energy supply, mobility and the heat sector

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www.invest-in-niedersachsen.com/hydrogen



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