



**NGlobal GmbH** -  
your first call  
in Niedersachsen!

**NGlobal**  
Niedersachsen Global GmbH



## Team

- **Gerhard Gizler**  
CEO  
☎ +49 511 89 70 39-13  
✉ gerhard.gizler@nglobal.de
- **Dr. Norbert Gebbe**  
Head of Investment Promotion  
☎ +49 511 89 70 39-15  
✉ norbert.gebbe@nglobal.de
- **Kirsten Redelfs**  
Head of Foreign Trade,  
Legal Affairs  
☎ +49 511 89 70 39-14  
✉ kirsten.redelfs@nglobal.de
- **Annette van Ost**  
Head of Marketing  
☎ +49 511 89 70 39-25  
✉ annette.vanost@nglobal.de
- **Dagmar Morcinek**  
National and International Fairs,  
World Expositions  
☎ +49 511 89 70 39-19  
✉ dagmar.morcinek@nglobal.de

Your contact for the  
energy industry:

- **Dr. Norbert Gebbe**  
Head of Investment Promotion  
☎ +49 511 89 70 39-15  
✉ norbert.gebbe@nglobal.de

## Energy expertise

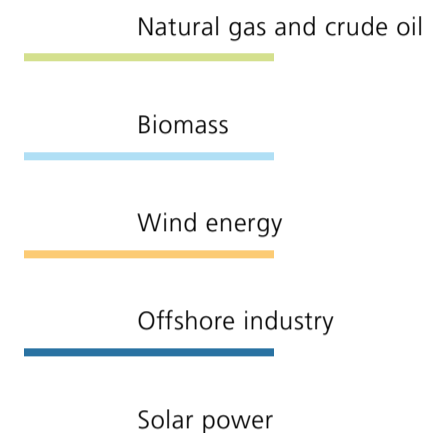
- A broad energy mix: fossil fuel resources, a high degree of wind power and many different types of biomass usage.
- An excellent environment: an outstanding infrastructure for the energy and, above all, the wind power industry.
- A leader in renewable energies: intensive use and development of the technologies of the future.
- A highly diversified research environment: university chairs and research centres for the energy industry.

**NGlobal**  
Niedersachsen Global GmbH

Osterstraße 60  
30159 Hannover - Germany  
T +49 511 89 70 39-0  
F +49 511 89 70 39-69  
info@nglobal.de  
www.nglobal.de

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## The energy industry in Niedersachsen



## NGlobal in Niedersachsen

NGlobal is the state owned One-Stop-Agency for economic development and international cooperation with main focus on **Inward Investment, Foreign Trade, Niedersachsen Marketing**. NGlobal is committed to enhancing Niedersachsen's economy by attracting foreign investment and new companies to the state, and encouraging inter-enterprise collaboration and joint ventures. The experts at NGlobal support Niedersachsen companies seeking to develop and expand their activities abroad. Niedersachsen, the logistics state, connects the world by sea, air, road and rail through its central location, where the continent's north-south and east-west transportation routes intersect. It is the home of Volkswagen AG and of the world's biggest trade fairs.

### Niedersachsen's economic strengths:

- Mechanical and Plant Engineering
- Mobility (Automotive, Logistics, Aerospace, and Telematics)
- Energy
- Life Sciences, Healthcare
- Food
- Media and Service Industries

NGlobal holds representations in: China, India, Russia, South Africa, USA and UAE and works with partners in: Cuba, Poland, Saudi Arabia and Scandinavia.

NGlobal – Your Experts on Niedersachsen – Let's get in touch! [www.nglobal.de](http://www.nglobal.de)



## Natural gas and crude oil

There are quite a number of crude oil and natural gas deposits in the north German lowlands. And in the last 150 years in which these resources have been tapped, companies in Niedersachsen have been responsible for advancing the necessary technology and have made a decisive contribution to the level of expertise in this field. Crude oil and natural gas are mined at depths of up to 5,000 metres. This continues to be a successful enterprise, as for years now, Niedersachsen's natural gas fields have been producing significantly more natural gas than is needed in the region. Niedersachsen therefore plays an important part in generating supplies for other federal states within Germany.

Niedersachsen boasts a renowned scientific institution engaged in researching the extraction of crude oil and natural gas, namely the Clausthal University of Technology. The steady rise in commodity prices means that the search for such deposits continues, and some of the mining and producing leases most recently granted are for sites in the region's Osnabrück and Schaumburg districts and on the North Sea coast. The crude oil mined in Germany accounts for 3% of the country's requirements – and that is enough to run 140,000 cars and heat a quarter of a million households.

## Biomass

Niedersachsen is one of the biggest suppliers of biomass used to generate bioenergy in the form of electricity, heat and fuel (biodiesel). Leading global enterprises that turn sustainable raw materials, i.e. all types of energy crops, wood, and plant-based and organic residues, into energy have established themselves here. Various conversion methods are used. The thermochemical methods used include carbonisation, condensation/pyrolysis and gasification. These methods result in energy in a solid, liquid or gaseous state.

The physico-chemical methods involve pressing or extraction to produce oils and fats. The addition of thermal gasification can then also produce synthetic gas which can be used to generate hydrogen and process synthetic fuels. There is then also a biochemical process which uses fermentation to produce biogas/sewage gas. In addition to standard fermentation, an alcoholic fermentation method is also used, in which yeasts or bacteria are added in order to turn saccharated, amylaceous or cellulose substances into alcohol (bioethanol).

## Wind energy

Wind power is used exclusively to generate electricity. And with just under 20,000 wind turbines in Germany, wind power is the country's most important source of renewable energy for electricity generation. These turbines achieve a total output of more than 22,000 megawatts (2007), which accounts for just under 7% of Germany's electricity needs.

There is now only limited scope for increasing inland wind power, but the generation efficiency can nevertheless be increased by up to 50% by means of repowering, i.e. modernising the existing turbines. This would make it possible to increase the proportion of electricity generated by wind power to 25%. One of the disadvantages of wind power is the irregularity of wind, which means that the baseload required for a sustained energy supply cannot be guaranteed. In this case, nearby power plants are currently needed in order to make up the difference. A solution to this problem would be electricity storage, but this is an area which has so far not been sufficiently researched.

## Offshore industry

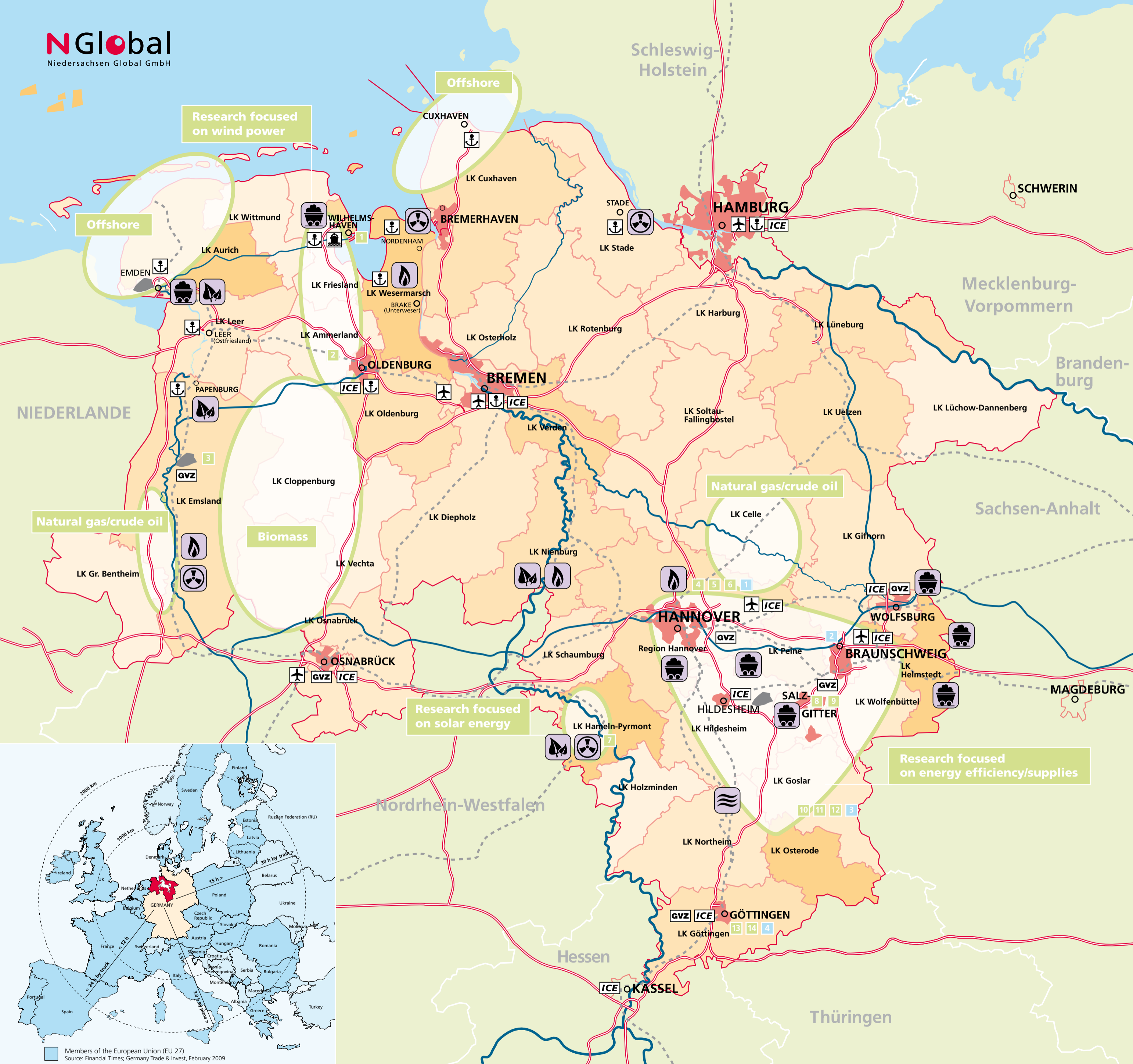
Because of their size, offshore wind power turbines have to be assembled near the sea, then transported to their final destinations by ship and erected with the help of special floating cranes or jack-up rigs, using substantial quantities of steel and concrete to firmly anchor them. The State of Niedersachsen had already developed a master plan back in 2003 to create the infrastructure needed for such operations. And in recent years, Niedersachsen's North Sea ports Emden and Cuxhaven have created the right conditions to allow businesses, new technologies and expertise to put down roots there.

With the extension of the Europakai wharf and the heavy-lift platform in Cuxhaven, it is now possible to handle rotor blades and entire wind turbine towers as special cargo. In addition, the offshore port with a gantry crane, which is currently under construction, will make it possible to load special products such as the turbines' foundation elements. This is yet another advantage of Cuxhaven within the logistics chain for the offshore industry. Niedersachsen therefore offers excellent conditions with which to attract more companies involved in the manufacture of components for the offshore wind energy.

## Solar power

Solar energy – comprising solar thermal energy and photovoltaics – is virtually inexhaustible and is almost always available. Solar thermal energy is a technology in which the sun's rays hit a collector, which turns the energy into heat. This sort of installation can provide up to 65% of a household's hot water requirements and solar thermal installations are often used to heat swimming pools or as water heaters.

Photovoltaics uses the sun's energy to generate electricity, with the sun's rays falling on solar cells that act as semiconductors. Electricity generated in this way can be used directly to power electrical appliances or it can be fed into the national grid. There is a whole host of outstanding research institutes based in Niedersachsen, such as the University of Oldenburg, the Institute for Solar Energy Research (ISFH) in Hameln and the Niedersachsen Energy Research Centre (EFZN) in Goslar, which is a research centre shared by all five of Niedersachsen's universities.



**Key players in the energy industry**

- 1 Deutsches Windenergie-Institut – DEWI
- 2 ForWind – Zentrum für Windenergieforschung
- 3 3N Kompetenzzentrum Nachwachsende Rohstoffe
- 4 Fernwärme-Forschungsinstitut
- 5 Landesamt für Bergbau, Energie und Geologie
- 6 Bundesanstalt für Geowissenschaften u. Rohstoffe
- 7 Institut für Solarenergieforschung – IfS
- 8 Institut für Hochspannungstechnik und Elektrische Energieanlagen – TU Braunschweig
- 9 Fraunhoferinstitut für Schicht- und Oberflächentechnik
- 10 Institut für Elektrische Energietechnik – TU Braunschweig
- 11 Forschungsverbund Energie Niedersachsen
- 12 CUTEC – Clausthaler Umwelttechnik-Institut GmbH
- 13 Fachinformationsstelle Bioenergie Niedersachsen
- 14 Interdisziplinäres Zentrum für Nachhaltige Entwicklung – IZNE

**Universities**

- 1 Institut für Energieversorgung und Hochspannungstechnik – Universität Hannover
- 2 FH Braunschweig/Wolfenbüttel – FB Versorgungstechnik, Energie, Umwelt, Gebäudemanagement
- 3 TU Clausthal – Fakultät für Energie- und Wirtschaftswissenschaften
- 4 FH Hildesheim/Holzwinden/Göttingen – Fakultät Ressourcenmanagement

**Power plants upward of 100 MW**

- Coal-fired power station
- Gas-fired power station
- Nuclear power station (with residual life)
- Biomass power station
- Hydroelectric power station

**Legend**

- Freight traffic centre
- Sea ports
- Railway lines
- Industrial estate/business park
- Niedersachsen
- Intl. airports
- Deep-water port
- Waterways
- Offshore-Flächen (geplant und genehmigt)
- Federal states
- ICE high-speed train stops
- Federal motorways
- Major cities

