



Stromtrasse vor blauem Himmel | © pholidito/fotolia

Energy Infrastructure

Major investments in the expansion of the transmission and distribution networks are planned as a result of renewable energy integration and the growing consolidation of Europe's energy markets. New technologies in the energy grid sector - including, for example, superconductors, high-temperature lines and local power transformers – are being tested in pilot projects. ICT solutions provide important information for the safe operation of power grids. Alongside battery storage with solar systems, large-scale storage solutions are playing a growing role in the balancing energy market. Hydrogen also plays an important role thanks to the linking of energy, heat and the mobility sector.

Testimonial: Gian Luigi Montorsi, Entrepreneur & CEO | Brulli Energia GmbH



Gian Luigi Montorsi, Entrepreneur & CEO, Brulli Energia GmbH | © Brulli Energia GmbH + GTAI

"Germany has the largest energy production pool in Europe, with a very challenging switching strategy from nuclear and fossil fuels to renewable sources. Moreover, it has one of the most efficient and reliable financing export platform systems with top-ranking reputable manufacturer industries in the world. We decided to set-up our international investment headquarters for hydro power plants and energy transmission grid in Germany in order to benefit from the opportunities these first-class industrial and financial services provide, in order to export the resulting model worldwide". (2019) *Brulli Energia GmbH – Gian Luigi Montorsi, Entrepreneur & CEO*

The German Electricity Market - A Brief Overview

The German electricity market is Europe's largest, with annual power generation of around 625 TWh and a capacity of around 200 GW.

Germany's domestic electricity market was fully liberalized in 1998 (Energy Industry Act), opening the market for new players and stimulating new business opportunities. Prior to liberalization, a defined supply area was typically served by a single supplier (e.g. local utility).

More than one thousand market participants are active in the fully liberalized German electricity market, with new market actors – who do not own power plants or supplier networks - successfully entering the domestic electricity market. The creation of the Bundesnetzagentur ("Federal Network Agency") regulatory office for electricity, gas, telecommunications, post, and railway markets in 1998 further opened up the power market. A

raft of measures promoting competition – including legal unbundling for suppliers with more than 100,000 customers – was introduced. The agency is responsible for ensuring non-discriminatory third party access to power network.

The fluctuating supply of electricity from renewables requires upgrades to be made to the entire power grid. An investment of over 35 billion euros is planned for the construction of high-voltage transmission lines - "electricity autobahns" - from the wind-rich north to major industrial regions.

Transmission system operators (TSOs) keep control power available to maintain stable and reliable supply. Demand for control energy is created when the sum of power generated varies from the actual load (due to for example unforeseeable weather fluctuations).

- [More information](#) ▶

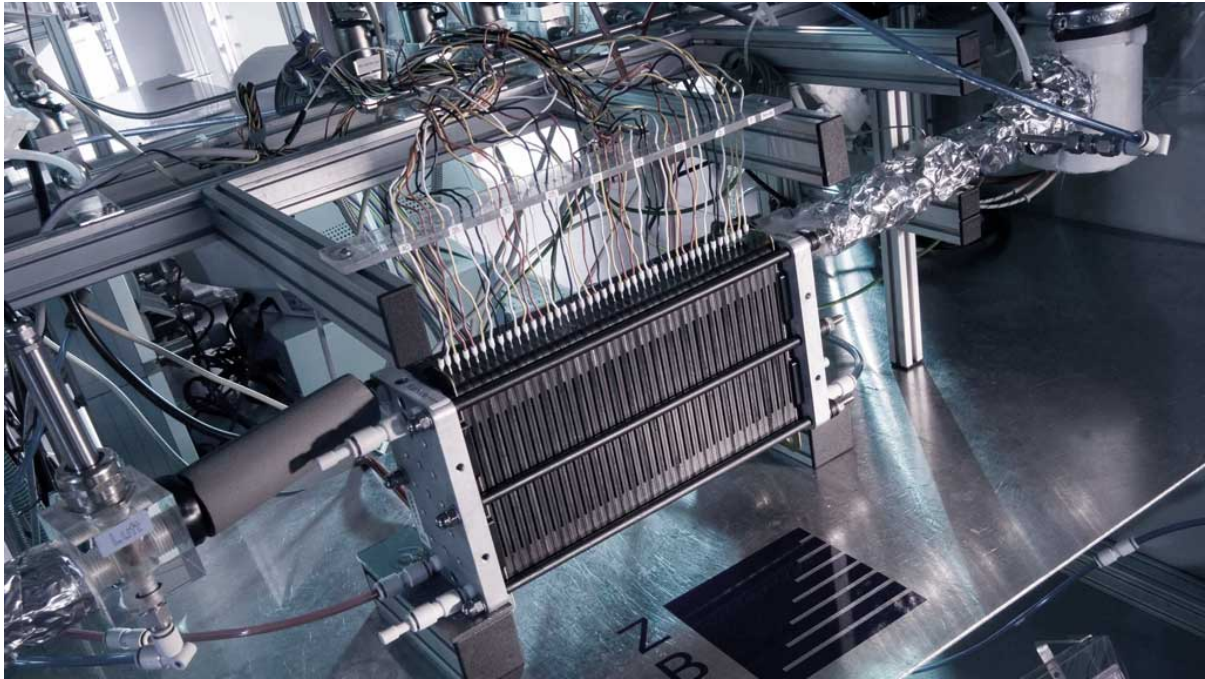
Smart Grids and Energy Storage

A significant renewable energy surplus is widely forecast for 2020; rising from an estimated 3.5-8 TWh for Smart Grids.

Germany is at the forefront in international smart grid development. Intelligent networks or "smart grids" allow fluctuating renewable energy power generation and consumption to be optimally managed by allowing a shift from "consumption-oriented generation" to "generation-optimized consumption."

Information and communication-based technologies (ICT) will play a central role in connecting the different parts of the energy system. Intelligent ICT solutions will allow smart grids to efficiently manage power generation, consumption and storage in tandem with so-called "smart meters."

Germany Trade & Invest helps open up a vista of opportunities for companies looking to cooperate with German partners, become involved in demonstration projects, and expand through direct investment.



Testing fuel cells | © ZBT GmbH Duisburg

Energy Storage & Fuel Cell Industry

Germany is taking the lead in both energy storage and fuel cell technologies - as a market, development platform and export hub.

- [More information ▶](#)

Research and Funding Programs

Funding Program “Smart Energy – Digital Agenda for the Energy Transition” (SINTEG)

The funding program "Smart Energy Showcases - Digital Agenda for the Energy Transition" (SINTEG) aims to showcase solutions for Germany's future energy system with high proportions of intermittent power generation on the basis of wind and solar energy. The program focuses on smart grids which should help to ensure stability and improve the interplay of power generation, consumption, storage and grids by means of modern information and communications technologies. Government and industry jointly invest EUR 600 million from 2016 to 2020 to showcase solutions for Germany's future energy system in 5 regions.

- **C/sells:** interconnected, regional energy systems with cellular structure and focus on PV integration that balance each other

- **Designnetz:** decentralized renewable power supplied flexibly to urban and industrial load centers
 - **Enera:** Stabilizing the grid by improved measurement and data analysis coupled with new market mechanisms.
 - **NEW 4.0:** Maximizing the efficient use of regional wind power overproduction by flexible demand response and inter-regional trade in electricity
 - **WindNODE:** Sectors electricity, heat, and mobility are integrated to flexibly accommodate fluctuating regional wind power.
- [More information](#) ▶

Kopernikus: Germany's Largest Research Initiative for the Energy Transition

The four Kopernikus-Projects aim to develop technological and economic solutions for the transition of the German energy system, from basic research to real-life application. As part of the energy research program "Research for an environmentally-friendly, reliable and affordable energy supply", the government plans to fund the projects with EUR 400 million between 2016 and 2025. The research is conducted in four key areas of the energy transition:

- **ENSURE:** The project aims to identify an efficient structure of the energy grid by integrating new technologies and combining centralized and decentralized energy supply to an integrated system.
 - **P2X:** Development of innovative solutions for "Power-to-X"-technologies to efficiently store, distribute and convert renewable energies to gas, heat or chemicals.
 - **SynErgie:** Customization of traditional production processes in energy-intensive industries to synchronize the energy demand with the volatile supply by renewable energies.
 - **ENavi:** Development of a navigation instrument to assess the short- and long-term impact of economic and political measures on the energy system.
- [More information \(German only\)](#) ▶

The 6th Energy Research Program

So far, between 2006 and 2015, the German government has provided about EUR 6.4 billion in energy research funding to promote the research and development of modern energy technology. In this way, the energy research program is making an important contribution to ensuring that the restructuring of the power supply in Germany is carried out in a secure and economical manner.

More about the 6th Energy Research Program of the Federal Government:

- ["Research for an environmentally-friendly, reliable and affordable energy supply"](#) ▶

Contact Us



Heiko Staubitz | © GTAI/Illing & Vossbeck Fotografie

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Submit your question

Testimonial: Dr. Christina Wuerthner | enersis europe GmbH



enersis europe GmbH – Dr. Christina Wuerthner, Chief Finance & Strategy Officer | © enersis europe GmbH/ GTAI

"We carefully compared several regions in Germany and analyzed various factors. The German capital region is strategically well located to conquer the energy market in all of Europe, in combination with our headquarters in Berne, Switzerland. The market potential, the support of GTAI and the Brandenburg Economic Development Board, the proximity to important political decisions in Berlin, space to grow and the access to highly-skilled labour locally, as well as from all over Europe, eventually all counted for our decision. From this location we want to make a substantial contribution to the 'Energiewende' (Energy Transformation) throughout both the German and European market." (2016) *enersis europe GmbH – Dr. Christi-*

na Wuerthner, Chief Finance & Strategy Officer



Heiko Staubitz | © GTAI/
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