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Powering a world in progress



50Hertz

# FACTS AND FIGURES 2015





# 50Hertz

As a transmission system operator in the centre of Europe, 50Hertz stands for the safe integration of renewable energies, development of the European electricity market and maintenance of high security of supply standards. We are responsible for managing the entire electricity system in the regions of the Federal States of Berlin, Brandenburg, Hamburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia. Our grid forms the backbone of the secure supply of electricity to approximately 18 million people – 24 hours a day, 7 days a week, 365 days a year.

We ensure grid integration of around 40 percent of the onshore wind power capacity installed in Germany, integrate this electricity into our grid and transport it to the centres of consumption. In doing so, we stand for transparent and non-discriminatory structuring of our social responsibility.

# 503

compensatory and replacement measures were planned and implemented in 2015 at the 50Hertz grid area. These included plantings and forestry measures as well as hydraulic-engineering measures and species conservation.



## FORWARD-LOOKING AND ENVIRONMENTALLY FRIENDLY

The energy transition cannot happen without grid extension. Anyone who wants to allow renewable energies to take the lead in the power system as a whole, from wind power to photovoltaics, must improve current lines, update lines and build new lines.

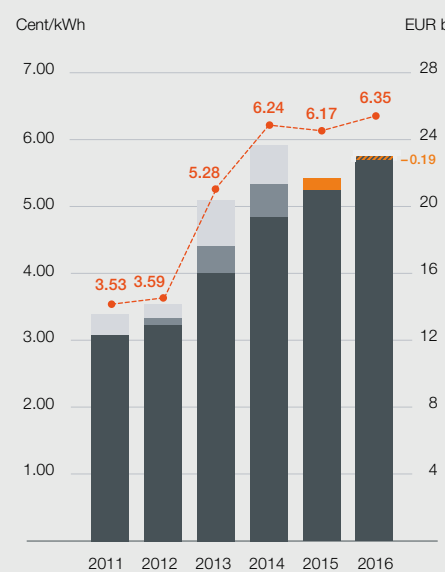
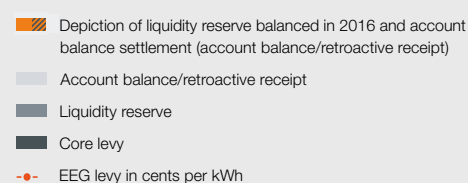
Through Ecological Aisle Management, 50Hertz is committed to forward-looking and environmentally friendly route planning and management. The principle: By respecting a safe operation, the aisle below an overhead line is managed in such a way that natural habitats can develop. A biologically and visually diverse aisle can develop in consideration of planning, implementation and maintenance.

## EEG LEVY

### Trends in the EEG levy

Details of the type and extent of the EEG levy calculation for the years 2011 to 2016 can be found on the transmission system operators Internet platform netztransparenz.de under the menu point EEG reallocation charge or annual/mid-term prognosis.

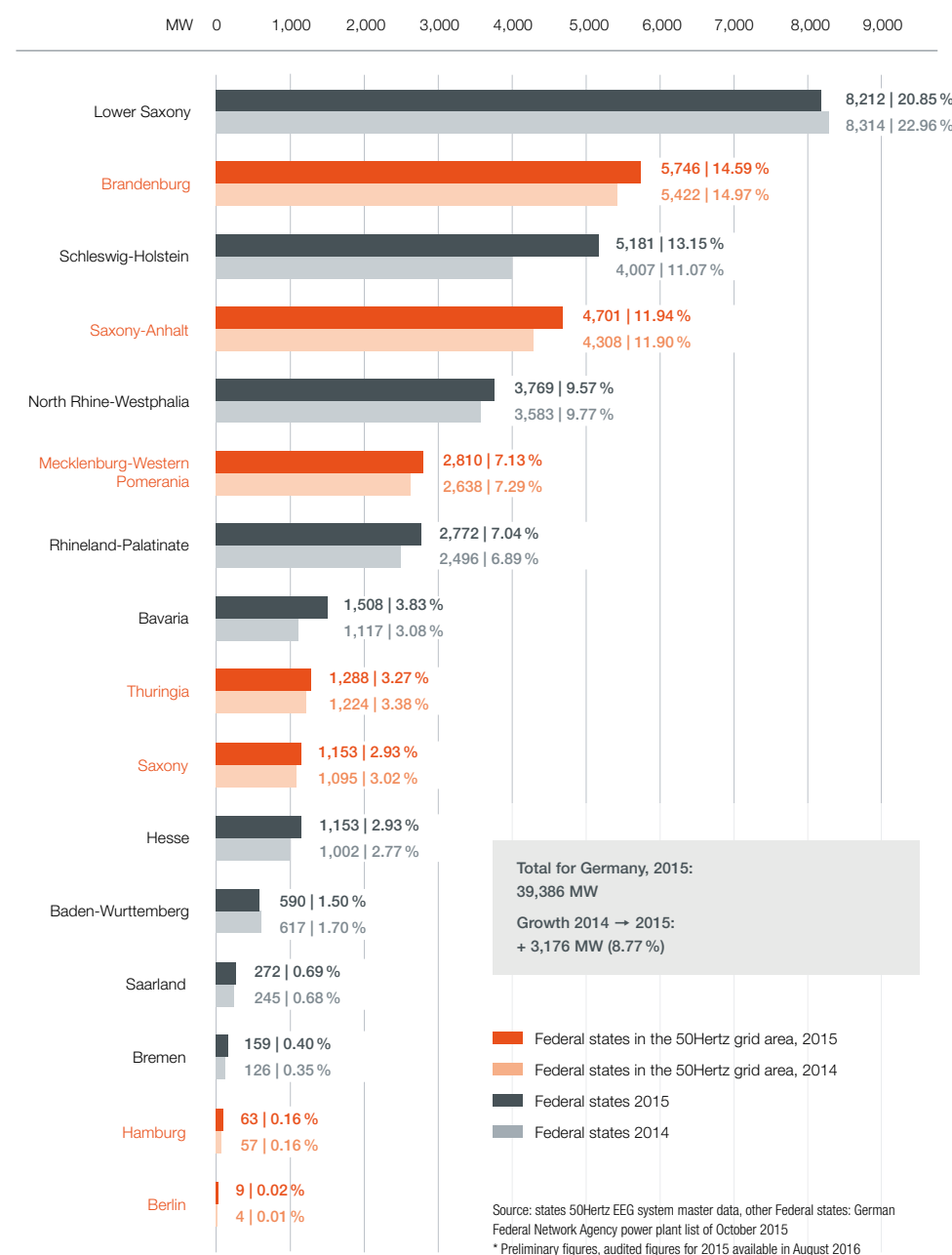
In the case of a positive account balance (2015), which is to be deducted in full from the EEG reallocation charge, the liquidity cushion and the account calculation are shown as balanced, if required.



Source: netztransparenz.de

## ONSHORE WIND-POWER CAPACITY

### Geographical distribution of installed onshore wind-power capacity in Germany by Federal state (absolute value in MW and proportion of all Germany in %), 2014 and 2015\*



Total for Germany, 2015: 39,386 MW  
Growth 2014 → 2015: + 3,176 MW (8.77 %)

Source: states 50Hertz EEG system master data, other Federal states: German Federal Network Agency power plant list of October 2015  
\* Preliminary figures, audited figures for 2015 available in August 2016

## 50Hertz AT A GLANCE

	Value	Portion of Germany
Control area	109,589 km²	~ 31 %
Total length of lines (corresponds to the power circuit length)	10,150 km	~ 30 %
Thereof overhead lines 220 kV	2,647 km	
Thereof overhead lines 380 kV	7,160 km	
Thereof sea cables 150 kV	270 km	
Thereof underground cables	73 km	
Maximal load	15,868 MW	~ 21 %
Power consumption (according to power output to end consumer according to EEG)	96 TWh	~ 20 %
Installed capacity	50,528 MW	~ 27 %
Share of renewable energy	26,975 MW	~ 30 %
Share of wind onshore	15,771 MW	~ 40 %
Share of wind offshore	336 MW	~ 10 %
Substations and switching stations	66	
Workforce	955	
Revenue (IFRS)	EUR 9.799 billion	
Thereof grid	EUR 1.495 billion	
Compensation payments and measures (Planned and implemented)	503	
Length of forest aisles suitable for Ecological Aisle Management	550 km	
Ecological Aisle Management currently being implemented		
Habitat development along the route	14 ha with more than 2,000 shrub plants	
Peripheral forest development	~ 5.5 km	

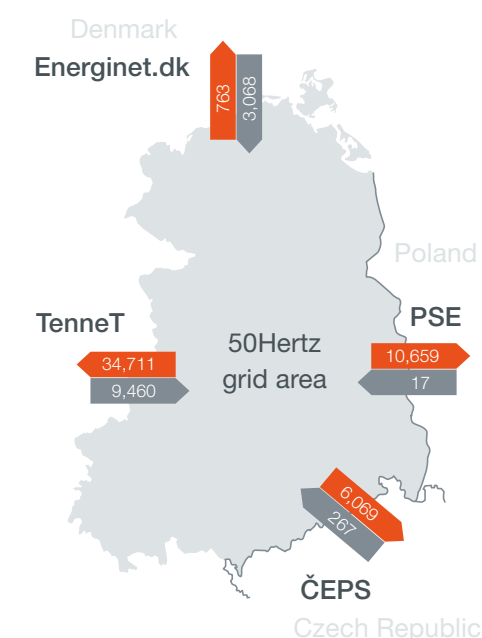
Information on 50Hertz Transmission GmbH, 50Hertz Offshore GmbH and Eurogrid GmbH, Status December 31, 2015

## CORE TASK

Our name is our mission: "50 Hertz" (50 Hz) is the setpoint frequency in the power grid and thus forms the basis for a reliable power supply. The core task of a transmission system operator is to ensure the stability of this grid frequency around the clock. We keep the 50 Hz frequency, the pulse of the European power supply, stable together with our domestic and foreign partners. In doing so, we integrate renewable energies safely into the grid and expand it according to requirements. In the case of grid extension, engaging in open dialogue with all stakeholders is part of our fundamental understanding. Our tasks also include a commitment to further development of the electricity market.

## EXCHANGE AND TRANSPORT

In 2015 a total of 52,202 GWh were exported and 12,813 GWh imported in the 50Hertz balancing zone. This results in an overall net export from the 50Hertz balancing zone of 39,389 GWh.



cumulative tolerance +/- one GWh due to rounded vales

## RENEWABLE ENERGY

The installed wind power capacity in the 50Hertz grid area is 16,107 MW, consisting of 15,771 MW of installed onshore wind energy capacity and 336 MW of offshore capacity. Thus, the 50Hertz grid area has access to about 38 percent of the installed wind power capacity throughout the whole of Germany. In 2015 alone, the increase in this area came to 1,310 MW or around 8.9 percent.

### Renewable energy in the 50Hertz balancing zone (2015)<sup>1)</sup>

Total capacity	26,975 MW
wind onshore/offshore	16,107 MW
photovoltaics	8,828 MW
biomass	1,812 MW
other <sup>2)</sup>	228.2 MW

<sup>1)</sup> Preliminary figures, audited figures for 2015 available in August 2016  
<sup>2)</sup> water, gas, geothermal

### Development of the installed capacity by EEG generating plants in the 50Hertz grid area and in Germany

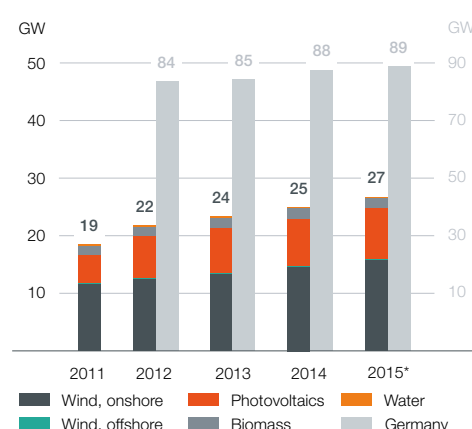
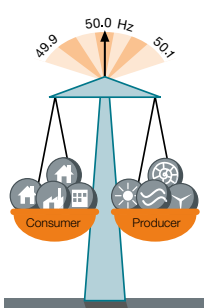


Chart does not include geothermal or landfill, sewage-treatment and mine gas  
\* Preliminary figures, audited figures for 2015 available in August 2016  
Source Values for Germany: German Federal Network Agency power plant list of October 2015

Working in a transparent and non-discriminatory manner in keeping the independence and neutrality required by the European Union is a matter of course for 50Hertz. Since 2012, 50Hertz has been certified by the German Federal Network Agency as a fully ownership unbundled transmission system operator (TSO). 50Hertz acts as an independent TSO and is also part of the international Elia Group.

Company shareholders are the Belgian TSO Elia System Operator NV/SA (Elia) with 60 percent and infrastructure fund Global InfraCo S.à r.l., managed by IFM Investors, with 40 percent.



## LOCATIONS

50Hertz is headquartered in Berlin. The heart of our business is the Transmission Control Centre (TCC) in Neuenhagen bei Berlin. We maintain seven regional centres to ensure optimal maintenance of our transmission system, substations and switching stations in the federal states of Berlin, Brandenburg, Hamburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

<b>Regionalzentrum Nord</b> Rostocker Chaussee 18 18273 Güstrow	<b>Regionalzentrum Süd</b> Goetheweg 125 09247 Chemnitz-Röhrsdorf
<b>Regionalzentrum Hamburg</b> Hagenredder 50 22117 Hamburg	<b>Regionalzentrum Südwest</b> Am Umspannwerk 8 06246 Bad Lauchstädt
<b>Regionalzentrum Mitte</b> Am Umspannwerk 10 15366 Neuenhagen bei Berlin	<b>Regionalzentrum West</b> Am Umspannwerk 1 39326 Wolmirstedt
<b>Regionalzentrum Ost</b> Sigmund-Bergmann-Strasse 1 03222 Lübbenau/Spreewald	



## LEGAL FRAMEWORK

As a transmission system operator, 50Hertz has the task of "operating, maintaining and, as required, optimising, enhancing and developing a secure, reliable and efficient electricity transmission grid in a non-discriminatory manner" (§ 11 of the German Energy Industry Act [EnWG]). 50Hertz' social obligations are defined by a wide range of legislative documents – laws, regulations and directives at national and European level. The central German regulations for transmission system operators are laid down in:

- The German Energy Industry Act (EnWG) and related ordinances, such as the German Ordinance on Access to the Electricity Grid (StromNZV), the German Ordinance on Grid User Charges (StromNEV) and the German Incentive Regulation Ordinance (ARegV)
- The German Renewable Energy Act (EEG) and related ordinances
- The German Energy Line Extension Act (EnLAG)
- The German Grid Expansion Acceleration Act (NABEG)
- The German Federal Requirements Plan Act (BBPlG)



## IMPLEMENTING THE ENERGY TRANSITION TOGETHER

Not to enter into dialogue with the communities with preferred variants for the overhead line route, but rather to involve these stakeholders in planning at an early stage – this is the aim of public participation. 50Hertz sees itself as the initiator of a sustainable dialogue that takes all important stakeholders into consideration and involves them at an early stage.

## STRONG COMMITMENT TO A SUSTAINABLE ENERGY TRANSITION



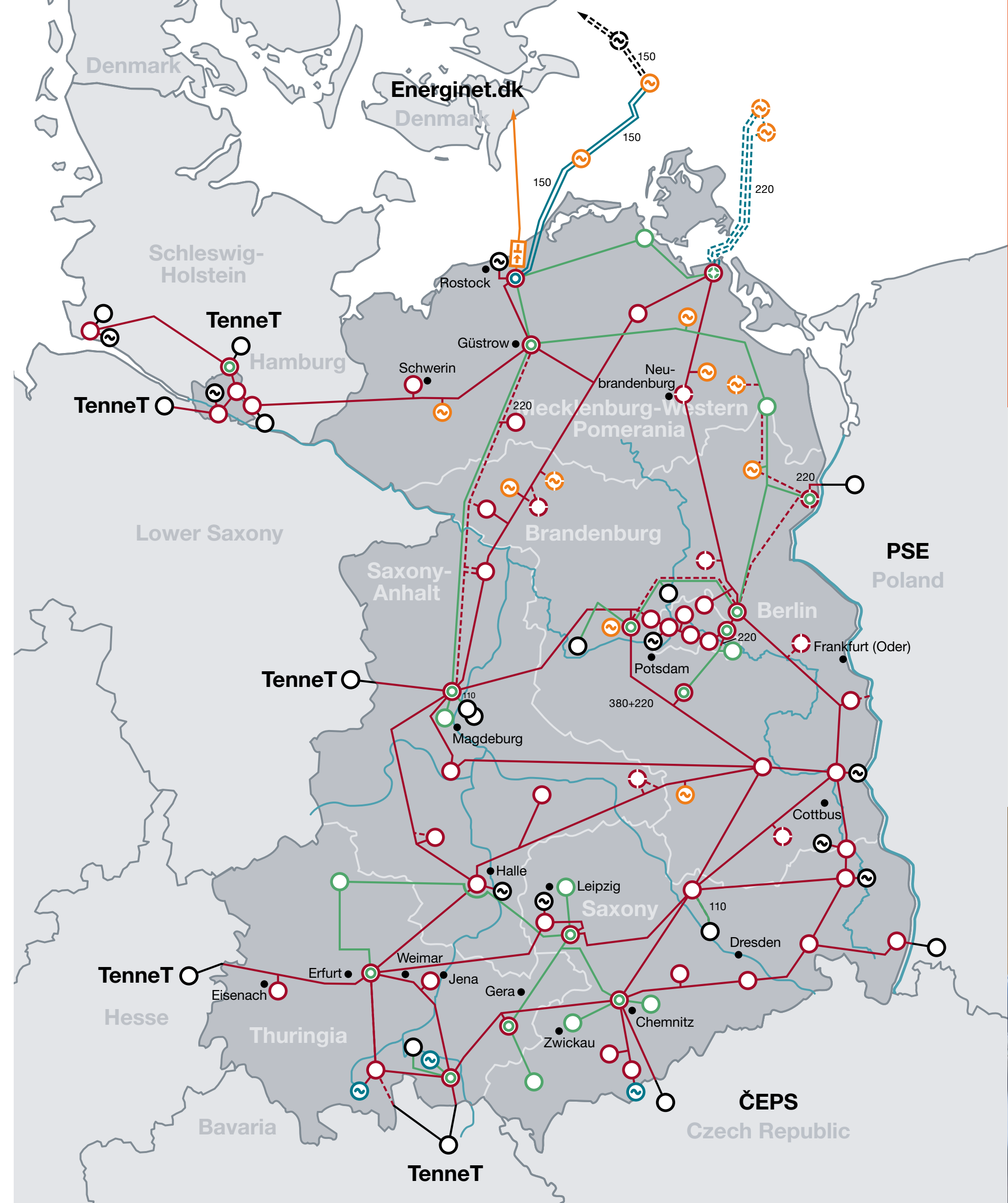
**Legend**

- Transformer stations (most with links to distribution system operators)
  - 220 kV ○
  - 380 kV ○
  - Transformation 380/220 kV ○
  - Transformation 380/150 kV ○
  - planned / under construction ○
- Other companies ○
- Line 380 kV —
- Line planned / under construction 380 kV —
- Line 220 kV —
- Operating voltage in kV 110 —
- Other companies 380/220 kV —
- Other companies planned / under construction 380/220 kV —
- HVDC/DC link 400 kV —
- Grid connection offshore 150/220 kV —
- Grid connection offshore planned / under construction 150/220 kV —

- System users:**
- Our customers are regional distribution system operators as well as power plants, pumped-storage plants, wind farms and major industries connected to the transmission system.
- Conventional power plant (lignite-fired, coal-fired or gas-turbine power plant) ⊖
  - Pumped-storage plant ⊖
  - Onshore/offshore wind farm ⊖
  - Onshore wind farm planned / under construction —
  - Offshore wind farm —
  - Offshore wind farm planned / under construction —

Status at December 2015

Klebefläche



**OFFSHORE ON SCHEDULE**

50Hertz targets a series of ambitious projects in the German Baltic Sea to transport the power generated from offshore wind farms to land via sea cables. In May 2011, the first German commercial offshore wind farm in the Baltic Sea, EnBW Baltic 1, was connected to the grid with 48 MW. In the year 2015, another German offshore wind farm followed with the grid connection of EnBW Baltic 2. The 80 wind turbines with an installed capacity of 288 megawatt are located 32 kilometres north of the Baltic Sea island of Rügen.



**49%**

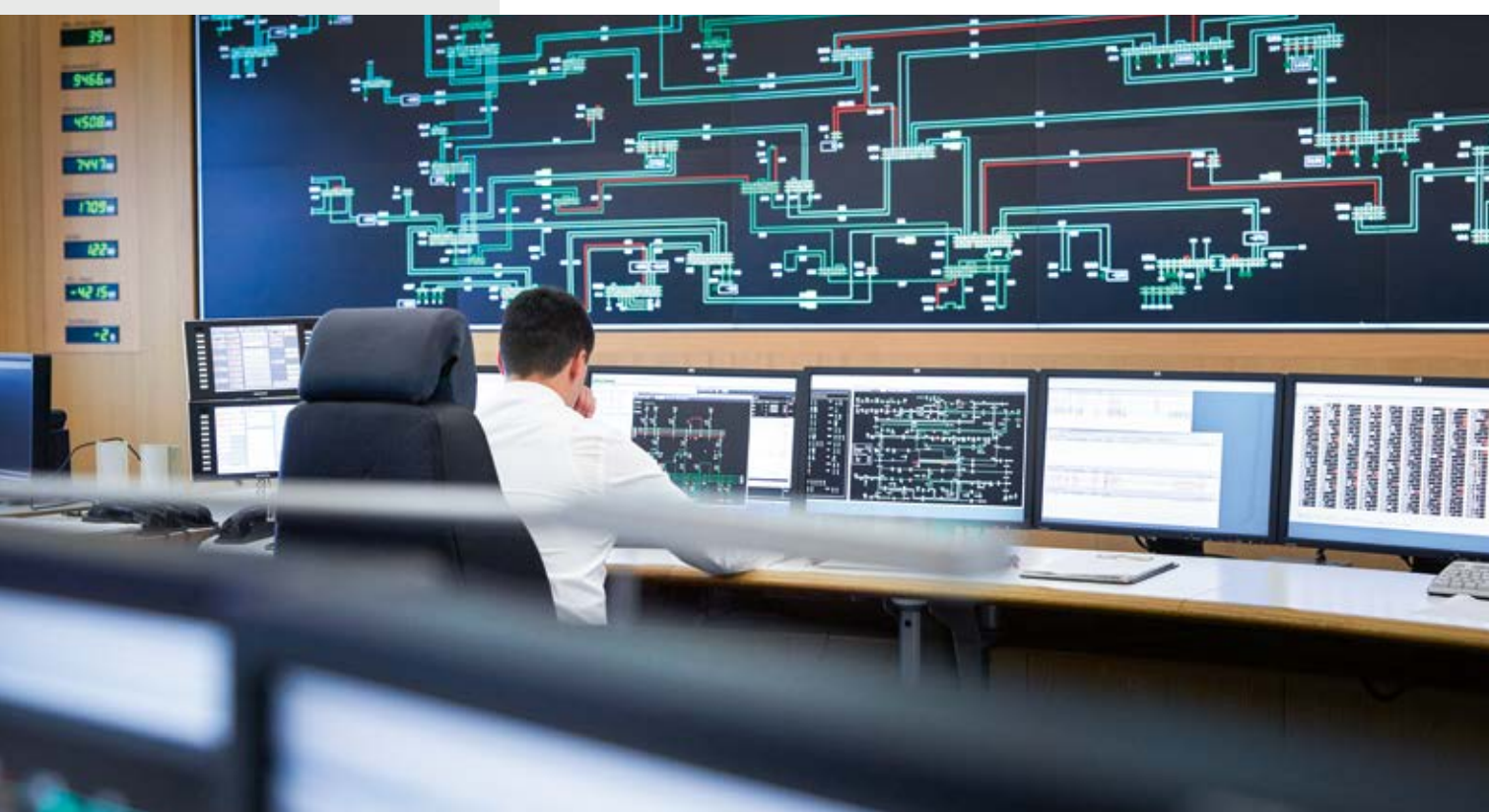
More than 49 percent of the power consumption is already covered by volatile renewable energies throughout the entire 50Hertz control area.

**10,150**

km power grid in the north and east of Germany as well as two offshore connections are operated by 50Hertz in Berlin, Hamburg, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

**APPROX. 100**

kg per metre is the weight of the sea cable 50Hertz uses for the connections to the offshore wind farms in the Baltic Sea.



**SECURING SYSTEM STABILITY 24/7**

50Hertz' core task is to ensure around the clock system stability within the transmission grid. If more electricity is generated than is consumed in the Northeast of Germany, 50Hertz exports this via interconnectors to higher load regions in Germany and neighboring European countries. Because of strong winds and developments in the field of photovoltaics, the amount of excess power in the region is continuously increasing. 50Hertz takes this excess and transports it securely to the centres of consumption.