



## Straight from the future

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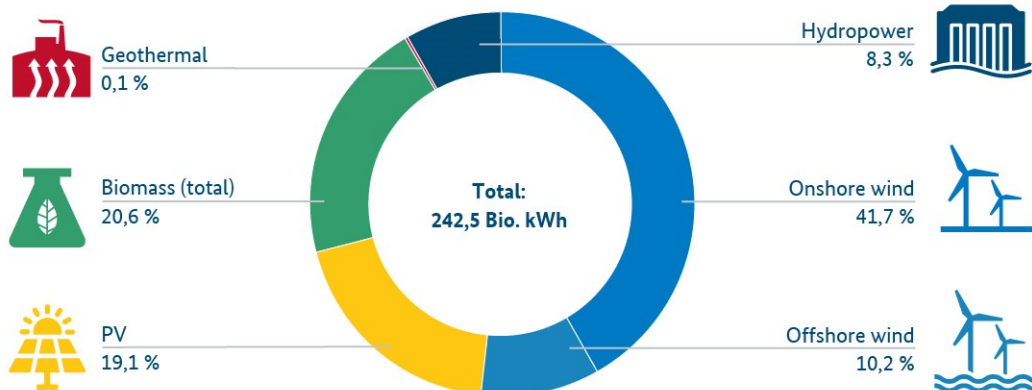


## More electricity from renewables

Solar, wind power, biomass etc. continue to increase their share in the German electricity mix. On average in 2019, they generated more electricity than all hard coal and lignite fired power plants and some 8% more than in 2018.

### Power generation from renewables continues to rise

Wind power accounts for more than half of Germany's power generation from renewables



Power generation from renewables in 2019

An increasing share of Germany's electricity supply comes from renewables. This can be seen from the latest edition of [Renewable Energy Sources in Figures. National and international developments, 2019 \(in German only\)](#), a brochure published by the Federal Ministry for Economic Affairs and Energy (in Germany only). Since its first edition in 2004, this publication has provided an overview of the latest data on renewable energy usage in Germany, the EU, and across the globe. The brochure is largely based on the comprehensive statistics and data made available by the Working Group on Renewable Energy Statistics (AGEE-Stat) on behalf of the Federal Ministry for Economic Affairs and Energy.

## **Renewables delivered almost 243 billion kilowatt-hours in 2019**

Electricity generation from renewable energy rose again further in 2019, by approx. 8% to nearly 243 billion kilowatt-hours. The share of gross electricity consumption covered by renewables also rose correspondingly clearly, to 42.1% (2018: 37.8%). The increase was largely due to favourable weather conditions and the further expansion of offshore wind-powered installations and of PV installations.

In 2019, solar energy accounted for 19.1% of Germany's electricity generation from renewables. Biomass made a contribution of 20.6%. Hydropower accounted for 8.3%, geothermal energy for 0.1%. More than half of the overall 242.5 billion kilowatt-hours generated came from wind power, with onshore wind power accounting for 41.7% and offshore wind power for 10.2%.

## **Wind energy leads the field in the German electricity mix**

This means that wind energy ranked first in Germany's electricity mix of 2019, taking that position from lignite. Wind power accounted for 21.9% of Germany's gross electricity consumption in 2019. Taking onshore and offshore wind power together, a total of nearly 126 billion kilowatt-hours of electricity was generated from wind-powered installations, a year-on-year rise of 14.5% (2018: 110 billion kilowatt-hours).

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### FURTHER INFORMATION

[\[→ BMWi-Broschüre 'Erneuerbare Energien in Zahlen. Nationale und internationale Entwicklung im Jahr 2019' \(in German only\)\]](#)

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# EEG surcharge will fall in 2021

Here's some good news for consumers: the renewable energy surcharge (EEG surcharge) every consumer in Germany pays to help fund green electricity will fall to 6.5 ct/kWh as of January 2021. This is the first time a federal grant is making this possible.



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The EEG surcharge has long been at the centre of the German debate on electricity prices. This renewable energy surcharge is used to finance a reliable, planned and cost-efficient expansion of renewables, particularly of cost-efficient technologies such as onshore wind power and PV. The surcharge is collected from electricity users via their electricity bills. As part of the [stimulus package \(in German only\)](#) to alleviate the impact of the coronavirus pandemic, the Coalition Committee agreed to top up the revenue from the German carbon pricing scheme with a federal grant, so that the EEG surcharge can be lowered from the current 6.756 ct/kWh to 6.5 ct/kWh in 2021. Without this grant, the surcharge would have risen to 9.65 ct/kWh, mostly as a result of the pandemic, causing a rise in electricity prices.

The federal grant ensures that the balance of the [EEG account](#) will be positive again in 2021. The decline in demand for electricity during the pandemic and the fall in prices at the electricity exchange had resulted in a negative balance exceeding €4 billion as of late September 2020. The grant worth €10.8 billion for 2021 is financed from the stimulus package and from revenue from the new [national carbon pricing scheme](#).

## EEG surcharge to be lowered to 6 cents per kilowatt-hour in 2022

When announcing the 2021 EEG surcharge in October 2020, Minister Altmaier said: 'For me, this is not only about a short-term adjustment. In fact, we are introducing a paradigm shift. In addition to the financing from the stimulus package, the EEG surcharges in the years to come will also be lowered using the revenue from the new national carbon pricing scheme. Higher revenue from this

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source will mean a greater burden is taken off electricity prices. This is what the Federal Government agreed in Germany's [2030 Climate Action Programme](#). As a next step, we will be lowering the surcharge to 6 ct/kWh in 2022. In my capacity as Federal Minister for Economic Affairs and Energy it is my primary objective to reconcile the mitigation of climate change with business and the economy. The gradual lowering of the EEG surcharge is an important feature of this approach.'

## **EEG surcharge had been stable since 2014**

Between 2010 and 2014, the renewable energy surcharge rose by 4.2 cents per kilowatt hour (ct/kWh) overall. In the 2014-2020 period, the surcharge remained stable, even as the share of renewable energy eligible for funding continued to rise. This proves that the fundamental reforms undertaken in recent years have made it possible to put an end to the spiralling increase and to stabilise both the surcharge and, with it, electricity prices as well.

Competitive auctions have brought down the cost for new wind power and PV installations. At the same time, these auctions are to ensure that the expansion of renewables continues at a dynamic pace, but better in step with the expansion of the grids.

## **Who pays for the EEG surcharge?**

Almost half of the EEG surcharge is financed by businesses, and just over one-third is funded by private households. Most of the rest is paid by public institutions. At present, the surcharge amounts to more than a fifth of private households' electricity bills. Railway companies and electricity-intensive companies facing international competition can apply for a partial exemption from the EEG surcharge. In 2020, the number of these applications for partial exemption from the EEG surcharge was 2,201 (2019: 2,261). The vast bulk of all companies (96% in the industrial sector) pay the surcharge in full.

The stabilisation of the EEG surcharge is also reflected in private households' electricity bills. Between 2014 and 2020, these bills increased by approx. 1.4% per year on average (taking into account the temporary VAT reduction this figure even drops to an annual 1% on average), which is in line with the overall rate of inflation in the same period (calculations based on data from the German Association of Energy and Water Industries (BDEW) and Destatis). Consumers wishing to benefit from lower electricity prices should compare prices on a regular basis.

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### FURTHER INFORMATION

[\[→ Press release by the Federal Ministry for Economic Affairs and Energy: 'Die EEG-Umlage 2021 sinkt – Entlastung aus dem Konjunkturpaket wird umgesetzt'](#) (in German only)

[\[→ Further information on the 2021 EEG surcharge: 'Fakten & Hintergründe'](#) (in German only) (PDF-Download, 132 KB)

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# Milestones below the sea

**For the first time, two different countries' offshore connections in the Baltic Sea have been linked up to form a joint grid. This new grid can be used to bring offshore wind power on shore, and also for cross-border electricity trading.**



© 50Hertz / Manfred Vogel

The helicopter is headed out over the open sea. It is taking course for the transformer platform of the Kriegers Flak wind farm, which may look tiny from above, but is of huge significance. It is here in the midst of the Baltic Sea that Europe is growing further together. Below the seabed, there are cables connecting up the Danish and the German electricity grids. This connection was recently completed as part of an innovative project undertaken by the two TSOs 50 Hertz Transmission (Germany) and Energinet (Denmark). The result is the world's first hybrid offshore interconnector, i.e. the first connection linking offshore wind farms to more than one country. The sea cable, which goes by the name of Combined Grid Solution or CGS, is two times 25 kilometres long and links up not only the two transformer platforms in the Baltic Sea, but also the offshore wind farms to the onshore grids. In other words, it makes it possible for electricity to be exchanged between the Danish and German grids. The project is a world first, which makes the CGS a template for future offshore electricity grids, of which several are being planned.

## How to make two into one

At the heart of the new system is an extension of one of the Kriegers Flak platforms, where the Danish and the German grids meet. The new Danish Kriegers Flak offshore wind farm and the two existing German Baltic 1 and Baltic 2 wind farms are part of the project. Once Kriegers Flak becomes operational, which is to happen in 2021, it will supply some 600,000 households on the Danish island of Zealand with electricity. Its output of 600 megawatts will make the wind farm Denmark's largest. Whenever there is little or no wind in the Baltic Sea region, meaning that little offshore wind power can be generated, the platform and the sea cable will mainly be used to exchange electricity between

the two countries. That way, the cables can be used to a capacity of up to 100%. This will also reduce prices for consumers.

What may sound simple was in fact very tricky to achieve. After all, the Danish and the German transmission networks do not work in synch. This meant that a special back-to-back converter had to be built and installed to allow for the exchange of electricity. This converter is now located in the Bentwisch transformer station near Rostock in Germany. On the Danish side, the connection leads to the transformer station in Bjæverskov. The back-to-back converter transforms the AC arriving from both sides into DC and then immediately back into AC, but in a form that works for the respective grid system. As a result, electricity can flow unhindered between the two countries and is available to the European electricity market. In other words, the Combined Grid Solution not only helps feed in renewables from offshore wind farms into the grid, but also improves grid stability and energy security within the German and Danish power networks. The cost of the German-Danish project, which is being supported by the EU, is approx. €300 million.

### **A super brain called 'MIO'**

In order to control the complex processes involved in electricity trading and the transport of wind energy output, the converter needs an electronic 'brain'. A special new technology called Master Controller for Interconnector Operation (or MIO for short) has therefore been developed for this purpose. With the help of innovative system management strategies, MIO ensures the right voltage, efficient utilisation of the submarine cable and protection of the entire technology against overload – all in real time. To do this, it relies on the double converter in Bentwisch and the German wind farms Baltic 1 and Baltic 2. In future, it will also use the Danish wind farm Kriegers Flak. This novel technology enables renewable energy to be integrated into the overall system and made available to the European markets.

Thanks to their expertise in sophisticated technologies, Danes and Germans have been able to work together to turn this project into reality. They are thus demonstrating good neighbourliness and have a clear perspective of what they want to achieve: an electricity supply that is covered 100% by renewable energy. The Combined Grid Solution brings both partners a big step closer to this goal. But why is this so important?

### **Will electricity grids like those on land also become available at sea?**

As we move into the future, the Baltic Sea will be of great importance for the development of offshore wind in Europe. WindEurope estimates that out of a total installed capacity of up to 450 gigawatts of offshore wind in Europe by 2050, the Baltic Sea will account for about 85 gigawatts. In the long term, the new solutions could create an electricity grid in the North Sea and Baltic Sea similar to that on land. The European Baltic Sea countries now want to promote the development of offshore wind energy by working more closely together. At the end of September 2020, they therefore signed a joint declaration, the [Baltic Sea Offshore Wind Joint Declaration of Intent \(in German only\)](#) establishing their plans. The initiative aims to strengthen cooperation based on a joint working group.

Offshore wind energy is also a priority of the German Council Presidency. The EU needs 360 gigawatts of renewable offshore energy to become climate-neutral. This is stated in its [Offshore Renewable Energy Strategy](#), which was published on 19 November 2020. Together with its

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neighbouring countries, Germany wants to promote further cross-border offshore projects in the future.

In his opening speech, Federal Minister for Economic Affairs and Energy Peter Altmaier praised the Combined Grid Solution, calling it a 'European flagship project for cross-border cooperation in the field of offshore wind energy which can go on to play an important role as we work to establish a climate-neutral Europe'. He went on to emphasise that the German Council Presidency is therefore also focusing on creating a supportive EU framework that has two key aspects in view: the effective transport of wind power and additional cross-border trade on these lines.

## Use of hybrid interconnectors set to develop

The Director of Internal Energy Market at the European Commission, Catherina Sikow-Magny, also predicts a great future for hybrid offshore interconnectors. Promising support in a statement on the opening of the Combined Grid Solution, she said: 'In order to support this development, we will create the necessary regulatory framework'. This support is crucial for the project to work: The current EU electricity market rules require 70% of the line to be opened for electricity trading; however, in a hybrid project like the Combined Grid Solution, this would lead to restrictions on wind power transmission. The European Commission has therefore granted Germany and Denmark an exemption.

Soon the hybrid interconnector between Germany and Denmark will no longer be the only one in the Baltic Sea. Other projects, to be completed by 2030, are already being planned: a set of Danish energy hubs (Danish project in the North Sea and Baltic Sea), North Sea Wind Power Hub (between the Netherlands, Germany and Denmark), WindConnector (between the Netherlands and the UK) and Nautilus between (Belgium and the UK).

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### FURTHER INFORMATION

- [\[> Press release by 50Hertz: Connecting Europe: 50Hertz and Energinet inaugurate the world's first hybrid interconnector](#)
  - [\[> Further information from 50Hertz about the Combined Grid Solution](#)
  - [\[> Video about the Combined Grid Solution by 50Hertz and energinet.dk](#)
  - [\[> Information on EU offshore strategy](#)
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## Quote of the week



'SINTEG's recipe for success is cooperation that is based on 300 project partners from the energy sector, science, industry and other fields. This has created a unique network of experts from all over Germany, which ensures that the solutions achieved in the respective test regions can be transferred to others. We will carry on with this work.'

**Prof. Werner Beba, Spokesperson for the SINTEG coordinators, at the final SINTEG conference**

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## What the press say

**This time in 'What the press say': A off-the-radar data centre that feeds on carbon dioxide; the future prospects of the North Sea and Baltic Sea as a centre of European power generation, and dena boss Andreas Kuhlmann on the right moment to say 'stop'.**



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### **brand eins, 12 November 2020: 'A story from Europe'**

The business magazine brand eins reports on Germany's first data centre that sequesters more carbon dioxide than it generates. It is located in a place well off the main IT map (in German only).

### **The Handelsblatt, 9 November 2020: 'How the North and Baltic Seas will become the centre of European electricity generation'**

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Power generation on the high seas is on the verge of a gigantic upswing, writes Handelsblatt. The EU aims to have 300 gigawatt of installed offshore wind capacity in European waters by 2050 (in German only).

### **The Tagesspiegel, 4 November 2020: 'When something cannot be done, you have to say stop'**

Where do we stand in the fight against global warming – and where do we go from here? The head of the German Energy Agency (dena), Andreas Kuhlmann, was interviewed by the Tagesspiegel (in German only).

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## **Eco-bonus can now be combined with other subsidies again (in German only)**

Anyone purchasing an electrically powered vehicle can now apply to receive further public funding in addition to the eco-bonus incl. innovation premium. This means that buyers can benefit from even higher subsidies. The revised Directive on the promotion of sales of electrically powered vehicles (eco-bonus) has been in force since 16 November 2020. Commenting on this change, Minister Altmaier said: 'With more than 34,000 funding applications for electric cars having been made in October, the eco-bonus has broken its own record for the fourth month in a row. This shows that the interest in electric cars continues to grow, which is a good signal for climate change mitigation. We want to continue to support this trend.' In October 2020, 32,324 eco-bonus applications were submitted for a total of 34,213 vehicles. Since the introduction of the innovation bonus in July 2020, more than 100,000 applications have been made. This is already well above the total figure for 2019.

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## **European Conference on Batteries**

The 'European Conference on Batteries' will take place as a virtual event from 24 to 27 November 2020 as part of the German Council Presidency. The focus of the conference will be 'The batteries of the future, the future of batteries'. Participants from industry, research and government want to come together to exchange information on developments in battery cell production, discuss important trends, and promote cross-border cooperation. The event also marks the launch of two major European projects that will focus on the entire battery value chain – designated 'Important Projects of Common European Interest' (IPCEIs), one of which is being coordinated by Germany. Batteries are

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considered a key technology for the energy transition. They have since become an essential component in electric vehicles, industrial products, and power grids etc.

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## Eight new companies helping to mitigate climate change (in German only)

Companies with particularly high corporate standards for mitigating climate change and saving energy can apply to become members of the 'Companies mitigating climate change' (Klimaschutz-Unternehmen) initiative. By joining, they voluntarily commit themselves to meeting high climate and energy efficiency targets. Speaking at the award ceremony for eight new members of the business network in November 2020, State Secretary Thomas Bareiß said: 'Such flagships clearly demonstrate that we can only successfully protect the environment if we work in cooperation with companies. I therefore encourage other companies to join the initiative.' Since 2009, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the Federal Ministry for Economic Affairs and Energy, and the Association of German Chambers of Industry and Commerce (DIHK) have been honouring companies that demonstrate a special commitment to mitigating climate change. The next round of applications is expected to start in February 2021. Information on membership can be found at [www.klimaschutz-unternehmen.de/mitglied-werden](http://www.klimaschutz-unternehmen.de/mitglied-werden).

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