Federal Ministry for Economic Affairs and Energy

Energiewende direkt

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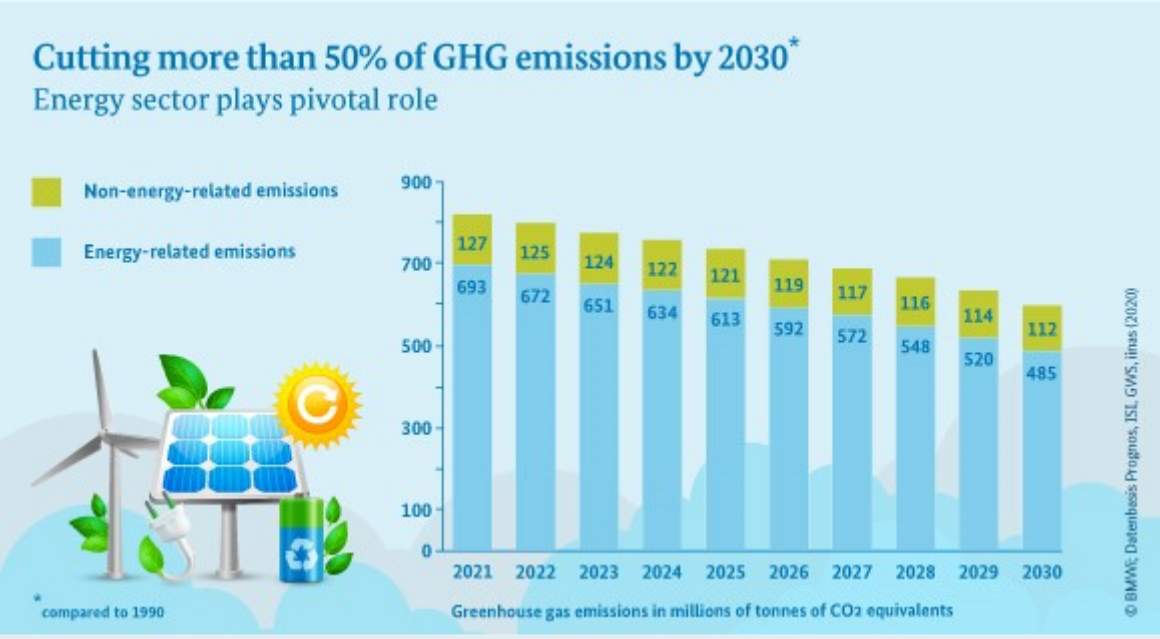
National Hydrogen Strategy adopted

Germany places great hopes in hydrogen as a key element for advancing the energy transition; it's now put a national strategy in place. **Find out more**

Germany is a world leader in cutting emissions

Germany wants to more than halve its greenhouse gas emissions by 2030 compared to 1990. This ambitious goal was reaffirmed in the National Energy and Climate Plan (NECP) adopted in mid-June.



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Germany is to become more climate-friendly and cut back heavily on harmful greenhouse gas emissions within only ten years. According to estimates by research institute Prognos AG, in 2030 GHG emissions could be up to 52% lower than in 1990. On behalf of the Federal Ministry for Economic Affairs and Energy, the institute has analysed the impact of the 2030 Climate Action Programme and provided estimates that also form the basis for the emission reduction targets set out in the National Energy and Climate Plan (NECP) (in German only). According to the findings, without its Climate Action Programme, Germany would only be able to reduce its GHG emissions by 41% by 2030. The measures adopted to date, however, will enable Germany to come very close to meeting its climate target of reducing GHG emissions by at least 55% by 2030. Moreover, they could be given fresh impetus from the National Hydrogen Strategy (in German only), which was also adopted in early June, and the 130 billion euro economic stimulus package of 3 June 2020 (in German only). The package contains targeted measures that are to provide a major boost to the economy, ensure social justice and help Germany make progress on protecting the environment and climate.

With emissions estimated to fall by 52% by 2030 against 1990 levels, Germany ranks well among the highly industrialised countries. A decisive role is played by the energy sector, which Prognos predicts will cut emissions to 183 million tonnes by 2030 – a decrease of 61% compared to 1990. This means that 97% of the emissions reduction target that was set for this period will be achieved.

For 2021, Prognos estimates that energy-related greenhouse gas emissions will amount to 693 million tonnes of CO_2 equivalents. This figure could fall to 613 million by 2025, and to 485 million by 2030, which would represent an overall decline of around 30%. According to the report, non-energy-related emissions could drop by about 12%, from 127 million tonnes in 2021 to just 112 million tonnes in 2030. In total, the forecast reduction of greenhouse gas emissions between 2021 and 2030 will amount to more than 220 million tonnes of CO_2 equivalents (27%). The CO_2 equivalent (CO_2eq) is a measure used to compare the emissions of the seven different greenhouse gases based upon their global warming potential (there are six such gases in addition to CO_2; more information from the German Environment Agency is available here).

It is very difficult to make accurate predictions about future trends in emissions and the effects of measures to mitigate climate change. Prognos's scenario analysis (in German only) is based on plausible assumptions and takes into account previous developments. It is thought to provide the most realistic model of the shape of things to come.

FURTHER INFORMATION

- Study by Prognos: Projections and Impact Assessments for the Energy Sector 2030/2050 (in German only)
- Integrated National Energy and Climate Plan (NECP) (in German only)
- 2030 Climate Action Programme (in German only)
- Brochure by the Federal Ministry for Economic Affairs and Energy: The National Hydrogen Strategy (in German only)
- Article by the Federal Ministry for Economic Affairs and Energy: Coalition Committee adopts Marshall Plan 2.0 (economic stimulus package of 3 June 2020, in German only)

Better safety for 'aviation lighthouses'

The WERAN research project is examining the effects of wind energy installations on radio navigation facilities used by air traffic. The results will allow accurate predictions about potential disruptive effects to be made during the planning phase of new wind farms.

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Finding the right answers to the crucial questions of our times is an aspiration shared by every researcher. As renewable energies become increasingly important to our energy supply, new research questions arise, stimulating a search for answers. To expand onshore wind energy, more space is needed – but what minimum distance is required between wind turbines and aviation navigation facilities, for example, and what impact do the former have on the latter? For the first time worldwide, researchers from Germany's national metrology institute PTB are now able to accurately describe the potential extent of disruptions caused by turbines and how these can be precisely measured.

'Aviation lighthouses'

Deutsche Flugsicherung (DFS), Germany's air traffic control company, operates about 60 navigation facilities. These flat ground stations, typically called 'VOR' (Very High Frequency Omni-Directional Radio Range) stations, permanently emit VHF radio signals using a rotational antenna array. In a way that is reminiscent of lighthouses, they enable aircraft to stay on course and thus help to ensure aviation safety. Wind energy installations, however, can disrupt the transmission of the radio waves emitted by VOR stations, distorting the accuracy of the direction signal. When reaching the surface of an installation, radio waves can scatter and be reflected. Due to the angular error that results, the aircraft receives a slightly distorted signal. In fact, it is theoretically possible for the plane to drift off course. This is why wind energy installations to be built within a certain radius of a VOR station are examined very carefully as to the potential disruptions they might cause.

The WERAN research project, which was funded by the Federal Ministry for Economic Affairs and Energy and conducted by PTB and its project partners, looked at the scientific foundations of previous assessment procedures, devised new metrology and developed a 'full-wave simulation' for angular error analysis. Within the framework of WERAN plus, its ongoing follow-up project, researchers are working on a new prediction method that will allow more realistic assessments to be made in advance concerning the potential disruptive effect that wind energy installations may have on VOR stations. The focus is on DVOR (Doppler Very High Frequency Omni-Directional Radio Range) navigation facilities, but conventional VOR stations are also being looked at. The goal is to provide a solid scientific foundation for the identification of necessary examination radii. It is thus hoped that current exclusion zones for wind energy installations can be reduced in the long term without putting aviation safety at risk.

Precision-navigation drones

The scientists developed drones that are capable of precision navigation. Equipped with eight rotors, these 'octocopters' are able to hover and carry out on-the-spot measurements at a height of up to several hundred metres. With the help of specially designed high-frequency metrology and antennas integrated into the drones, the researchers were able to measure precisely how DVOR radio signals spread and are reflected and scattered when they hit an installation. They could also gauge how the reflected signals and the direct DVOR signals overlap to produce an angular error. Furthermore, they showed to what degree wind energy installations are actually responsible for DVOR total angular error as opposed to influences from other sources such as buildings, high-voltage lines or woodland.

Parallel to this work, the project partners from Leibniz University Hannover developed simulations that allow a mainframe computer to calculate the extent of an angular error caused by wind energy installations. The results of these simulations were compared with the detailed measurement data collected by the octocopters. At present, Jade University of Applied Sciences is engaged in an operation to measure (D)VOR signals over longer distances – including at sea – with its manned research aircraft 'Jade One'. Again, the goal is to analyse the interplay between wind energy installations and navigation facilities.

Paving the way for faster and more rigorous decisions on planning applications

The way measurements at wind farms matched the simulations and the results of the improved prediction tool has given rise to a new state of the art that is now being put into practice: Since 1 June 2020, a new formula has been used to calculate disruptive effects on radio navigation facilities (in German only). This formula had been developed by the Federal Supervisory Authority for Air Navigation Services (BAF) and Deutsche Flugsicherung GmbH (DFS) on the basis of PTB's research findings. The Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Ministry for Economic Affairs and Energy (BMWi) have also agreed on further measures. Once the new examination methodology has been satisfactorily confirmed, the radius for examination zones – currently 15 km – is to be adapted.

These decisions are a positive signal for the expansion of onshore wind energy. The new prediction method can make it possible for faster and more rigorous decisions to be made in future on whether planning permission should be granted. In fact, it allows precise forecasts to be made during the planning phase of wind farms on the potential disruptive effects they might have on radio navigation

facilities. Application of this method in practice will show what specific improvements this will lead to on the sites of individual VOR stations.

Also, a ring test conducted within the framework of WERAN plus to compare different prediction methods for forecasting the disruptive effects of wind energy installations is expected to provide further insights. It allows institutions that also have a specific interest in the impact of wind energy installations on DVOR signals to reflect on the research results of WERAN plus and relate them to their own findings. Afterwards, the results will be compared with one another.

FURTHER INFORMATION

- Information on the 'TransUrban.NRW' regulatory testbed (in German only)
- Press release by the Federal Ministry for Economic Affairs and Energy: 'Regulatory sandbox for the energy transition launched in former coal-mining area amid coronavirus crisis' (in German only)
- German government website on energy research: Overview of the regulatory sandboxes for the energy transition (in German only)
- Article by the Federal Ministry for Economic Affairs and Energy on the 'SmartQuart' regulatory sandbox: 'The future of energy put to a practical test'
- Information on the Federal Government's 7th Energy Research Programme (in German only)
- Article by the Federal Ministry for Economic Affairs and Energy: Regulatory sandboxes as experimental areas for new energy technologies

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Adoption of Germany's National Energy and Climate Plan (NECP)

Germany's National Energy and Climate Plan (NECP) was adopted in early June and submitted to the EU Commission. The NECPs allow the European Member States' energy and climate policies to be compared and coordinated for the first time.

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Twenty-eight plans to achieve one goal: in order to achieve the EU targets for 2030, the EU Member States are to join forces to address the energy transition and mitigate climate change in the EU together. And the National Energy and Climate Plans (NECPs), as a new planning and monitoring instrument at EU level, are to help them do so.

Across 28 documents totalling thousands of pages, the EU Member States describe in detail their national energy and climate policies for a period of 10 years. The legal basis for this is the European Regulation on the Governance of the Energy Union (Governance Regulation). This Regulation requires all EU Member States to draft an NECP for the period between 2021 and 2030 and also sets down the rules for how the plans are to be structured and what these are to contain.

Energy and climate policies of all EU countries to be transparent and comparable

The NECPs allow for the European Member States' energy and climate policies to be compared and coordinated for the first time. This ensures transparency and a common basis for exchange – for example between neighbouring countries. This will help, for example, to prevent any negative impacts from the planned measures and make it easier to identify opportunities for cooperation.

The Integrated NECP adopted by the Federal Cabinet on 10 June 2020 is based on various national strategies, targets and measures such as the 2010 Energy Concept (in German only) , the 2030 Climate Action Programme (in German only) and the 2050 Energy Efficiency Strategy (in German only).

Concrete targets and an update every two years

The NECP contains specific targets such as increasing energy efficiency by reducing primary energy consumption by 30% by 2030 (compared to 2008) and expanding the share of renewable energies to 30% of gross final energy consumption by 2030. These are also the Federal Government's target contributions for achieving the EU energy targets for 2030. The NECP also reaffirms the national greenhouse gas reduction target of at least 55% by 2030 (compared to 1990) and the Federal Government's commitment at the UN Climate Change Summit in autumn 2019 to pursue greenhouse gas neutrality by 2050 as a long-term goal. As of 2023, a progress report on the NECP must be prepared every two years. This is because the EU Commission wants to assess the measures that each Member State is taking and the progress being made on reaching their targets.

FURTHER INFORMATION

[→ Integrated National Energy and Climate Plan (NECP), (PDF-download, 3 MB, in German only)
[→ BMWi press release: Cabinet adopts Federal Government's Integrated National Energy and Climate Plan (in German only)
[→ Information page of the Federal Ministry for Economic Affairs and Energy: National Energy and Climate Plan (NECP) (in German only)
[→ Article published by the Federal Ministry for Economic Affairs and Energy: What exactly are the National Energy and Climate plans (NECPs)?

Quote of the week

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'The time for hydrogen and the technologies enabling its use has come. We must therefore harness the potential for economic output, employment, and the climate, and do this now. Hydrogen will be a key feedstock for a successful energy transition.'

said Peter Altmaier, Federal Minister for Economic Affairs and Energy, speaking about the Federal Government's hydrogen strategy in mid-June

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What the press say

This time in 'what the press say': Hydrogen wherever you look – why several EU states, including Germany, are now demanding hydrogen plans from the EU Commission; how hydrogen can be produced at sea and how Germany now wants to 'hit the gas on' its hydrogen strategy.

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The Handelsblatt, 15 June 2020: 'Several EU countries call for hydrogen plans from the EU Commission'

Germany and other EU states have called on the EU Commission to present a strategy for the expansion of climate-friendly hydrogen energy. The Handelsblatt reports on the background of these calls (in German only).

The people behind the 'Smart Energy' showcases (SINTEG)

How can Germany make the energy transition a success? How can an energy supply that is largely based on renewables be ensured for the entire country in an environmentally acceptable, secure and economically efficient manner? To answer these questions around 300 project partners are working in five model regions as part of the SINTEG project. These showcase regions are: C/sells, Designetz, enera, NEW 4.0 und WindNODE. They allow a glimpse into the world of the energy of tomorrow. It is the work of the project partners at universities, research facilities, institutes, companies, associations and foundations that makes SINTEG a success every day. Serving as representatives for hundreds of other

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experts involved, a number of those working on those projects have been selected to be presented on the website of the Federal Ministry for Economic Affairs and Energy as part of an exposé on the 'Menschen hinter der Steckdose von SINTEG' (The people powering SINTEG, in German only).

Route plan for even more energy efficiency by 2050

Germany is on the way to even greater energy efficiency. The Federal Government's dialogue process entitled '2050 Energy Efficiency Roadmap' marks the beginning of another part of the 2050 Energy Efficiency Strategy, which was adopted at the end of 2019. The roadmap is based on the European goal of climate neutrality by 2050 and describes how this target can be achieved. Representatives from science, business and civil society are exchanging their knowledge and ideas to develop further instruments and measures for increasing energy efficiency. These include measures for the various sectors such as buildings, energy and transport, and cross-sectoral measures in the areas of digitalisation, training and skilled workers. They also address cross-sectoral system issues. These measures are then to supplement the National Action Plan on Energy Efficiency (NAPE). In autumn 2022, the Federal Government intends to adopt a strategy paper on the 'Development paths of energy efficiency up to 2050' (in German only).

The coronavirus crisis: Coalition agrees on a stimulus package

In response to the economic consequences of the coronavirus, Germany is to introduce a 130 billion euro stimulus package. On 3 June 2020, the Coalition Committee agreed on the relevant key points and on targeted measures. The economic stimulus package is primarily intended to strengthen demand, safeguard employment and stabilise it in a targeted manner, promote investments by companies and local authorities and advance the modernisation of the country based on a forward-looking stimulus plan. Important energy policy parameters include the reduction of the surcharge on renewable energy in 2021/2022 and an increase in the CO_2 Building Modernisation Programme for 2020/2021. Lower-emission and zero-emission vehicles are to be promoted, for example, by accelerating the expansion of the charging station infrastructure, doubling the existing purchase premium ('innovation premium') for electric cars and making additional investments in battery cell production, as well as by basing the motor

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vehicle tax more strongly on carbon emissions. As a next step, the agreed plans and measures will be discussed by the Federal Cabinet (in German only).

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