Federal Ministry
for Economic Affairs
and Climate Action

IN FOCUS

RENEWABLES PLAY A CENTRAL ROLE IN THE ELECTRICITY SYSTEM

Renewables have become the most important source of electricity. It is now important to extend the use of renewables to other sectors to achieve further carbon reductions.

The growth of renewable sources of energy in Germany continues to set new milestones. In 2023, a new record high for the share of renewable energy in total electricity consumption was reached. An abundance of wind and sunshine as well as the significant increase in photovoltaic systems led to a significant rise in renewable electricity generation in 2023. The previous year's record level was exceeded again in 2023.

According to estimates by the Working Group on Renewable Energy Statistics (AGEE-Stat), renewable energy accounted for a total of 272.4 terawatt hours (TWh), which equates to 51.8% of gross electricity consumption in 2023 (see Figure 1). This represents an increase of 5.6 percentage points over to the previous year's figure of 46.2%. This means that, for the first time, more than half of Germany's electricity consumption was covered by renewables in 2023. This development was mainly due to the increase in onshore wind energy. With a total output of 118.2 TWh, an increase of 18.5 TWh of onshore wind power compared to the previous year (+18.6%) was recorded. The amount of electricity generation from hydropower and photovoltaic installations also rose compared to the previous year.

The Federal Government has amended the Renewable Energy Sources Act (EEG) with the aim of increasing the share of gross electricity consumption that is covered by renewables to at least 80 per cent by 2030. Through the phase-out of coal-fired electricity generation, Germany seeks to achieve its goal of ensuring that its electricity supply is largely greenhouse gas neutral by 2035.

Decline in electricity generation from coal, natural gas and nuclear power

According to the Working Group on Energy Balances (AGEB), electricity generated by lignite and hard coal-fired power plants fell by 25% and 36.2% respectively in 2023.

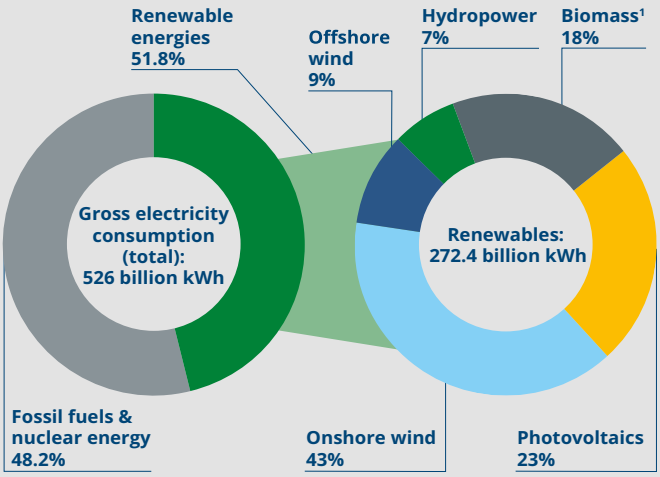


Figure 1: Gross electricity consumption from renewables in Germany in 2022. (Source: Working Group on Renewable Energy Statistics, Current as of 02/2023)
[1]Gaseous, liquid and solid biomass including biogenic waste

Due to the nuclear phase-out completed in April 2023, electricity generation from nuclear energy dropped by 79.2%. There was also a slight decline in electricity generation from natural gas (1.7%). Overall, electricity generation in Germany fell by 11.1% compared to the previous year. In contrast, electricity imports from neighbouring countries increased significantly in 2023 (42.5%). Most of the electricity imported by Germany came from Denmark and France. Around half of all imports were renewable electricity. In the European market, electricity is always generated at locations with the lowest production costs. In this way, the Member States benefit mutually from favourable production conditions in their respective neighbouring countries.

Room for improvement in the transport and heating sectors

According to the rules for calculation set out in the EU Renewable Energy Directive (RED II, 2018/2001), 22% of final energy consumption in Germany was covered by renewable energy in 2023. This represents an increase of 1.2 percentage points over the previous year. In 2020, Germany achieved a share of renewables of 19.1%, thus exceeding the EU directive target of 18%.

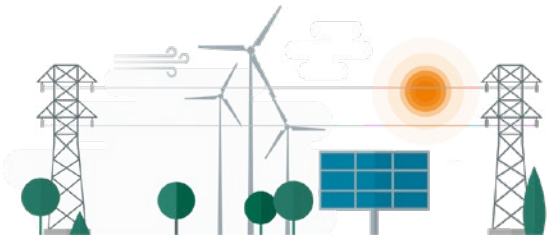
However, the expansion of renewables varies greatly from sector to sector: over the past 10 years, the share of renewable energy in gross electricity consumption doubled, reaching 51.8%. By contrast, growth in the heating (+5%) and transport (+1.6%) sectors was rather low. In 2023, the share of renewable energy iwas 18.8% in the heating sector and 7.3% in the transport sector.

These differences between sectors are also reflected in the emissions savings figures for renewables: according to estimates by the Federal Environment Agency (Umweltbundesamt), replacing fossil fuels with renewables saved a total of almost 250 million tonnes of CO_2 equivalent in 2023. With a share of 78% (195 million tonnes), electricity generation accounts by far for the largest proportion of ü energy savings. In the heating sector, 44 million tonnes of CO_2 equivalent could be saved (18%), while the transport sector contributed only about 4% of the total savings, with 10.5 million tonnes replaced by biofuels.

IN BRIEF

How will electricity demand develop?
Increased energy efficiency and energy savings make an important contribution to the energy transition. But more needs to be done: despite more efficient energy use and savings, final energy consumption in Germany has decreased only slightly over the past 33 years (by 10% from 1990 to 2022). Economic growth and increased consumption are preventing a more pronounced decline. In 2023, final energy consumption fell by 3% over the previous year. The comparatively sharp drop in final energy consumption in 2023 is partly due to reduced energy use by companies and households as a result of the temporarily high energy prices following the Russian war of aggression against Ukraine.

What measures were taken to ensure security of energy supply during the energy crisis?
In response to the energy crisis resulting from the Russian war of aggression, the Federal Government took various measures to ensure security of supply. In addition to a temporary lifetime extension until April 2023 of the last three remaining nuclear power plants on the grid, a law was passed in summer 2022 to maintain substitute power plants and to reduce gas consumption in the electricity sector in the event of an impending gas shortage. This created the basis for keeping gas and coal-fired power plants, which previously could not be operated or could only be operated to a limited extent, on the grid for a limited period until March 2024. In the lignite sector, five large lignite-fired power plant units were taken off security standby and the decommissioning date stipulated in the Coal Phase-out Act was postponed for two further power plant units. As gas prices stabilised and the expansion of renewable energy picked up speed, the seven lignite-fired power plant units only fed 1.93 TWh into the grid in the first quarter of 2024, which represents about 17.5% of electricity generation. In line with the expiry of the measure to keep them in operation, the seven lignite-fired units were finally decommissioned at the end of March.



Imprint

Publisher:
Federal Ministry for Economic Affairs
and Climate Action (BMWK)
Public Relations
11019 Berlin
www.bmwk.de

Last updated:
July 2024

Design:
The Ad Store GmbH, 20354 Hamburg