Germany renewable electricity

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At 140 terawatt hours, more renewable electricity was generated in Germany in the first half of 2024 than ever before, accounting for 65% of net public electricity generation. Generation from fossil fuels continues to decline as do the electricity prices on the exchange. These are the findings of the half-year data on net public electricity generation presented today by the Fraunhofer Institute for Solar Energy Systems ISE. The analysis is based on the data platform energy-charts .

Total electricity production amounted to 215 TWh in the first half of 2024, compared to 222 TWh in the same period in 2023. The share of fossil fuels in the energy mix continued to fall, dropping from 39.6% to 35.0%. At 75 TWh, less electricity was generated from coal, natural gas, oil and non-renewable waste than ever before. Since 2015, electricity generation from renewable sources has risen by 56%, while generation from fossil sources has fallen by 46%.

In the first half of 2024, Germany had on balance a net import surplus of 11.3 TWh compared to a net export surplus of 0.8 TWh electricity during the same period in 2023. Electricity imports came from Scandinavia (Denmark, Sweden and Norway), France, Switzerland, Belgium and the Netherlands. Due to the favorable electricity prices of wind and hydropower in Scandinavia, electricity imports were cheaper than electricity from German coal and gas-fired power plants. Electricity was exported to Austria, the Czech Republic, Luxembourg and Poland.

The expansion of electrical energy storage, an important factor for balancing renewable electricity generation with the load throughout the day, is progressing. In the first half of 2024, storage systems with an output of 1.8 GW and a capacity of 2.5 GWh were connected to the grid. At 9.9 GW, the installed capacity of battery storage is now equal to that of pumped storage. In terms of storage capacity, battery storage is at14.4 GWh and pumped storage at 40 GWh.

Source: Fraunhofer-GesellschaftFraunhofer Institute for Solar Energy Systems ISE - German Net Power Generation in First Half of 2024: Record Generation of Green Power, Generation from Fossil Fuels Continues Decline

The total share of renewable energies in energy consumption (electricity, heat and transport) rose to 22 per cent in Germany in 2023. In 2022, this share was at 20.8 per cent. This positive development was the result of a growth of renewables in the electricity and heat sector while overall energy demand declined.

According to current analyses by the Working Group on Renewable Energy Statistics (AGEE-Stat), more renewable electricity than ever before was generated in 2023 (272.4 terawatt hours (TWh), a plus of 7 per cent compared to 2022 with 254.6 TWh). While overall electricity consumption decreased due to economic factors (-5 per cent compared to 2022), the share of renewable energy in gross electricity consumption rose to

a new record of 51.8 per cent.

As concerns photovoltaics (PV), average weather conditions compared to the extremely sunny previous year led to a relatively small increase in PV electricity production despite strong increase in new PV-installations. Overall, the installed capacity of PV power plants grew by 22 per cent compared to 2022 (+14,595 MW), but solar power generation increased only slightly to 61.2 TWh (2022: 60.3 TWh).

Furthermore, a year with high precipitation led to an increase of 11 per cent in electricity generation from hydropower (2023: 19.6 TWh; 2022: 17.6 TWh). In contrast, electricity generation from biomass fell by around 5 per cent compared to the previous year (2023: 49.3 TWh, 2022: 51.7 TWh). The amount of electricity generated from geothermal energy stayed low at 0.2 TWh in 2023.

In order to achieve the national targets of the Renewable Energy Sources Act (EEG) and the targets set at European level by the Renewable Energy Directive (RED), the expansion of photovoltaics is on track, but the expansion of new wind energy plants on land and at sea must be significantly increased.

With a share of 83 per cent (170.6 TWh), biomass continued to be the most important renewable heat source in 2023, followed by 25.7 TWh from near-surface (and deep) geothermal energy and environmental heat (through heat pumps) with 12.5 per cent. While biomass was at a similar level as the previous year (2022: 171.9 TWh), the heat produced by heat pumps increased by a significant 18.3 per cent. A sharp rise in heat pump sales was noticeable in 2023. At 9.1 TWh, the share of solar thermal energy was around 4.4 per cent, just below the previous year"s figure (2022: 4.8 per cent).