



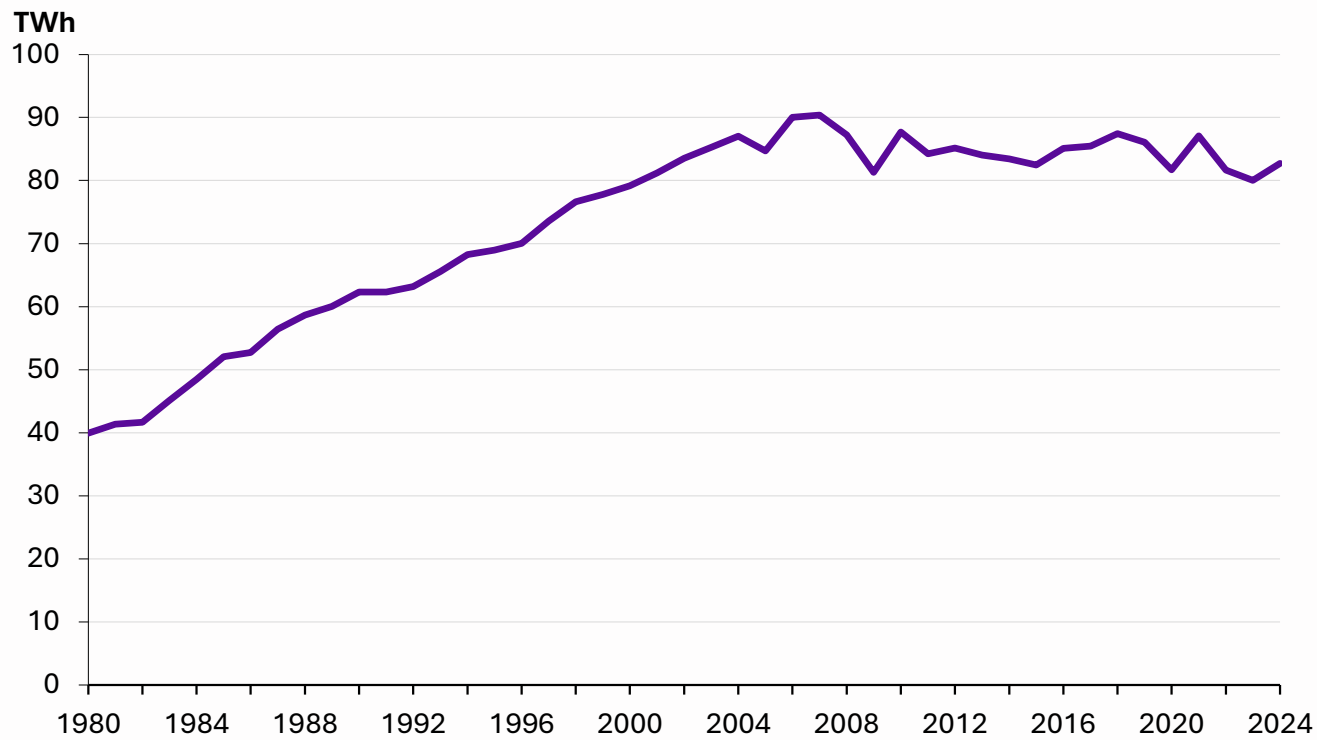
Energy Year 2024 Electricity

15.1.2025

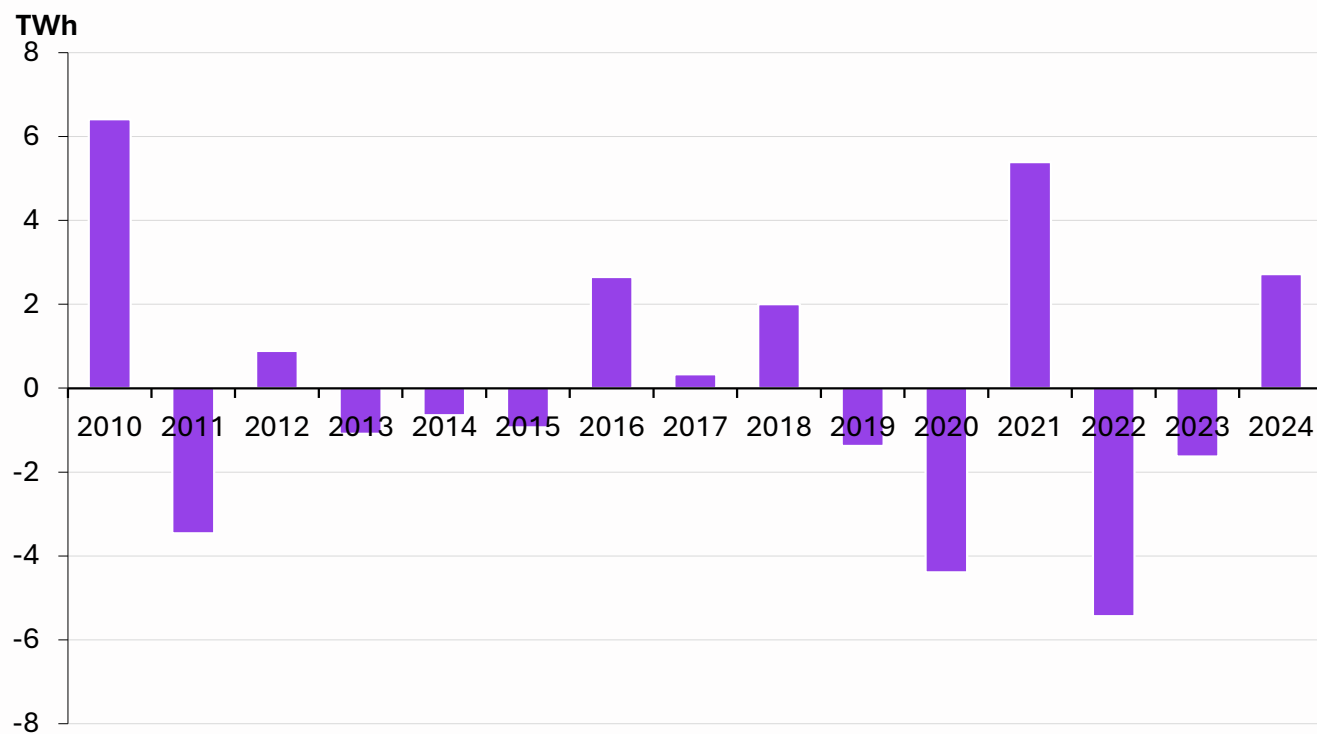
Preliminary data of electricity 2024



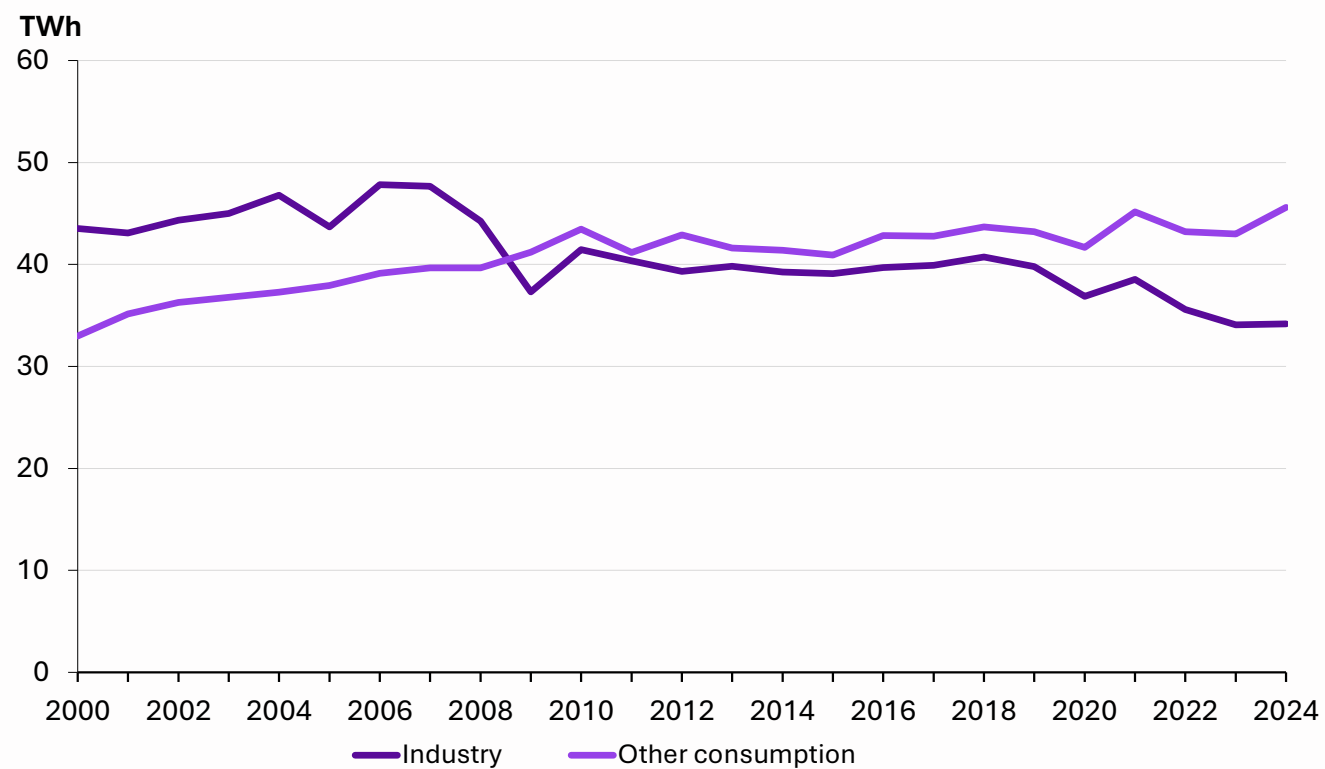
Electricity total consumption 83 TWh, 3 percent increase compared to 2023



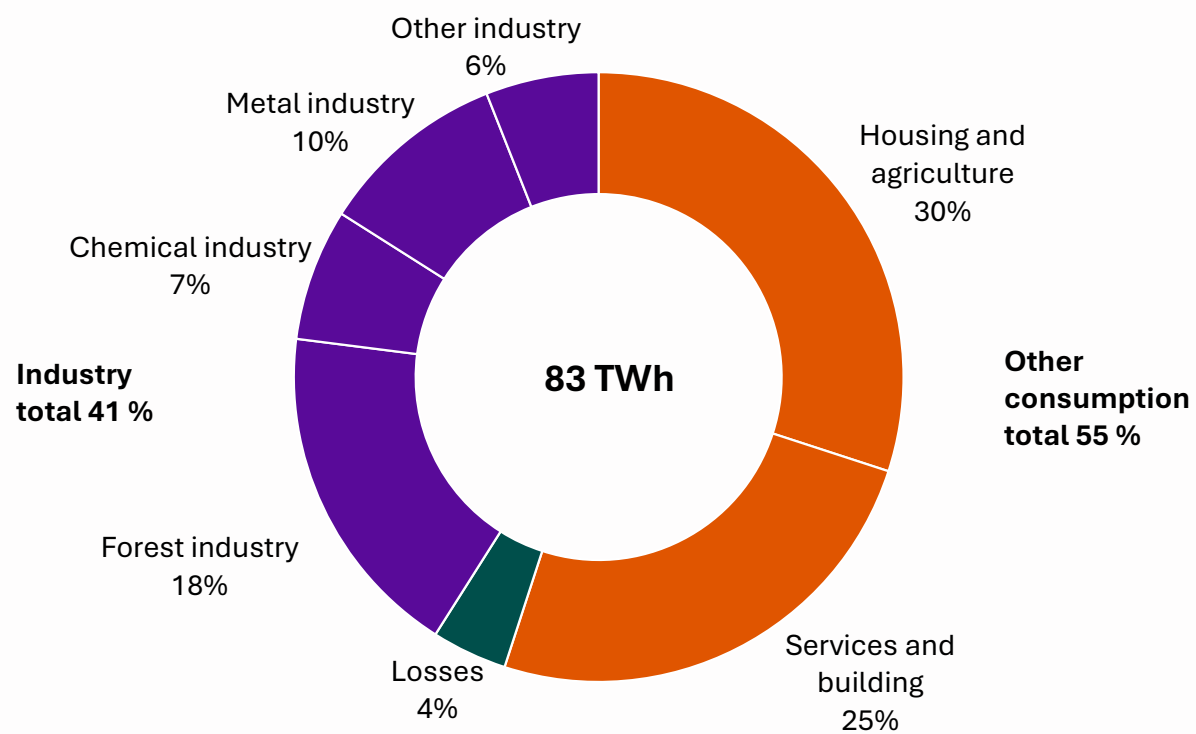
Electricity consumption increased from the previous year, 2.7 TWh change 2023-2024



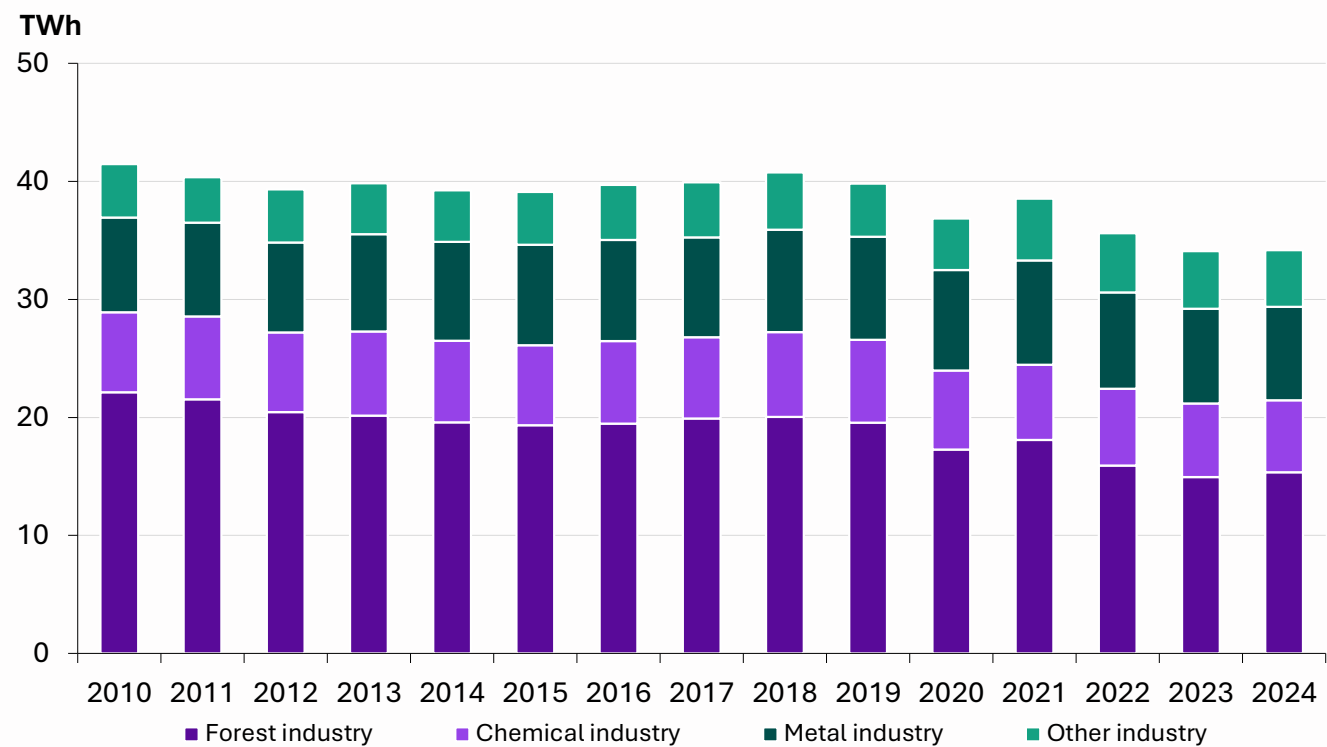
Development of industry and other electricity consumption



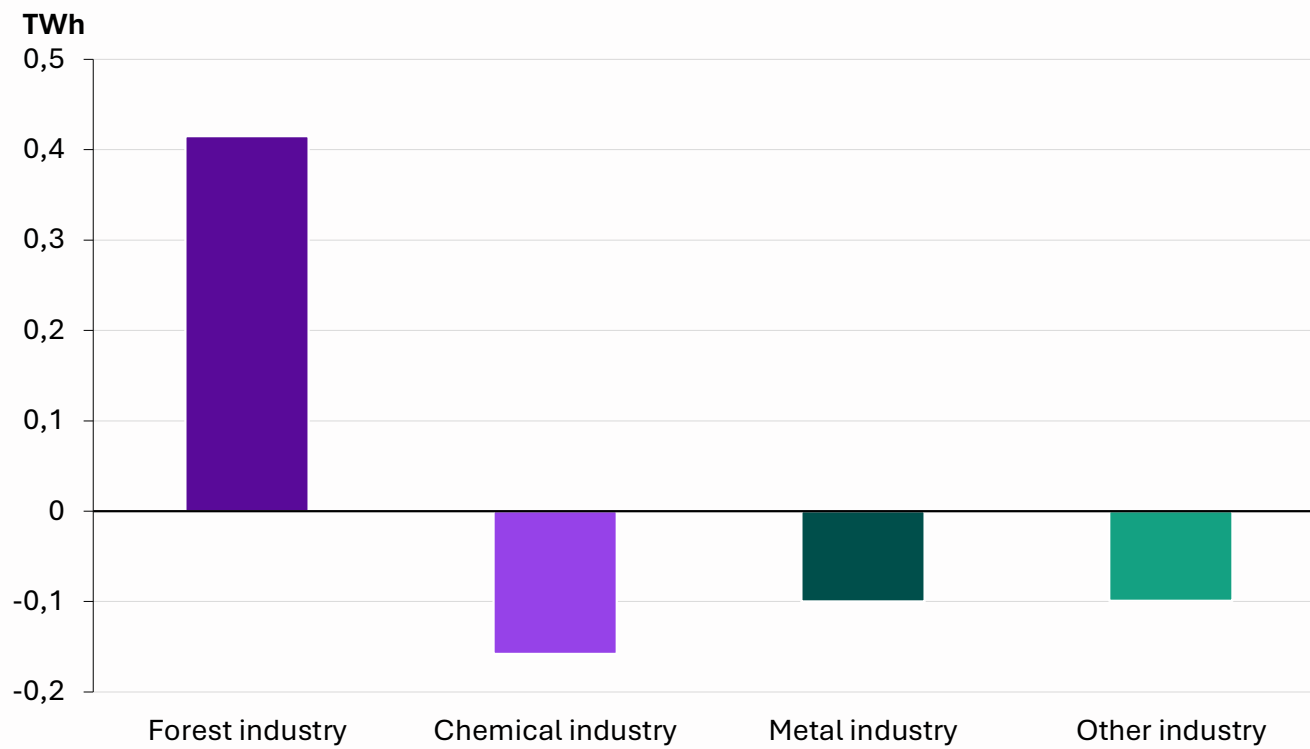
Electricity consumption 2024



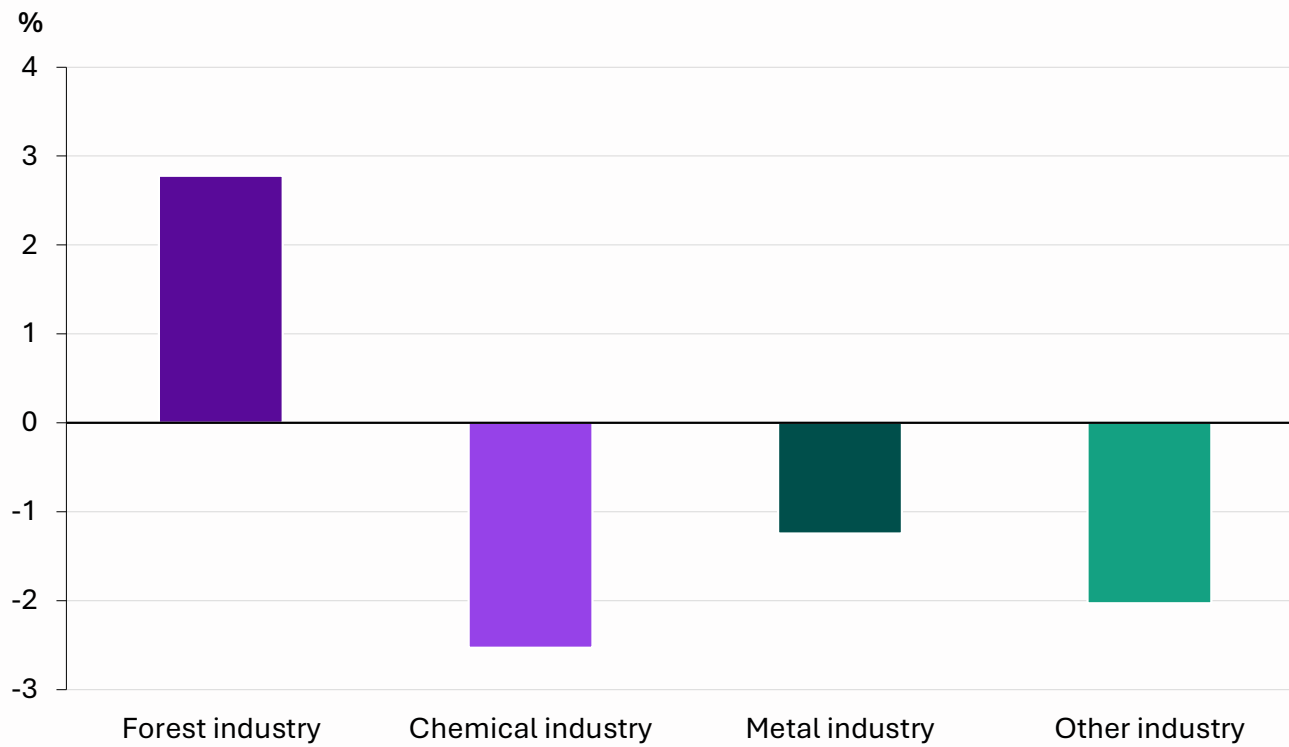
Electricity consumption of industry increased 0.2 percent Consumption total 34 TWh



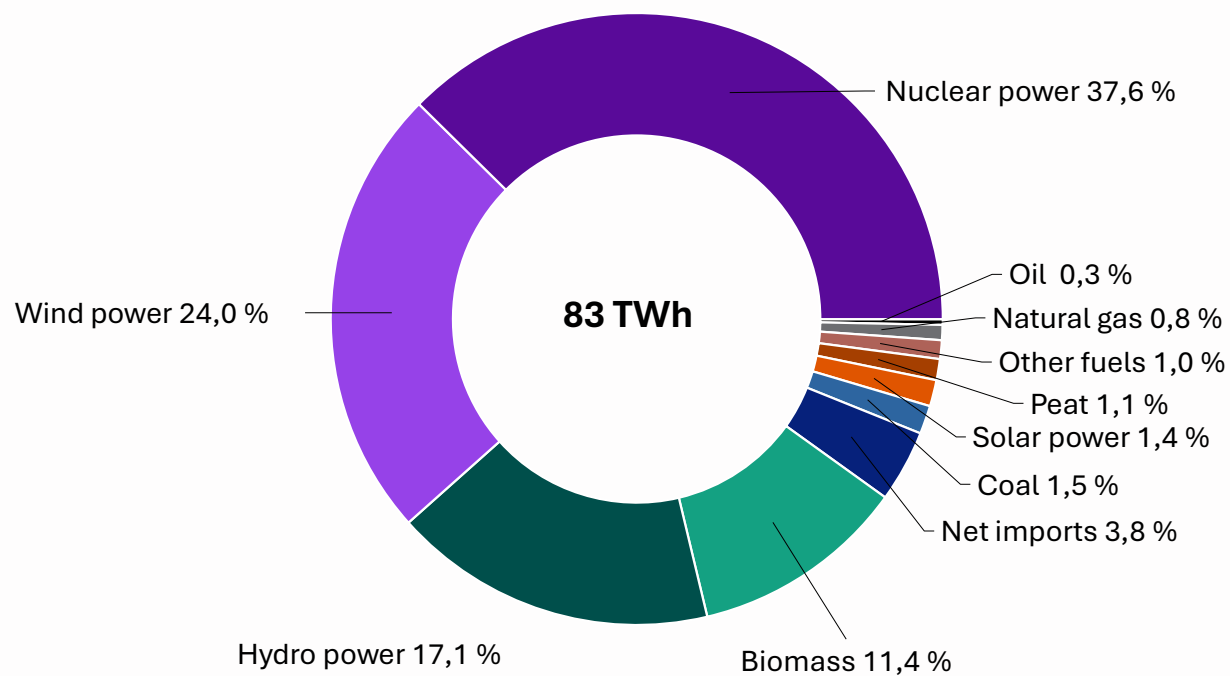
Industrial electricity consumption 2022-2023: most of increase in forest industry



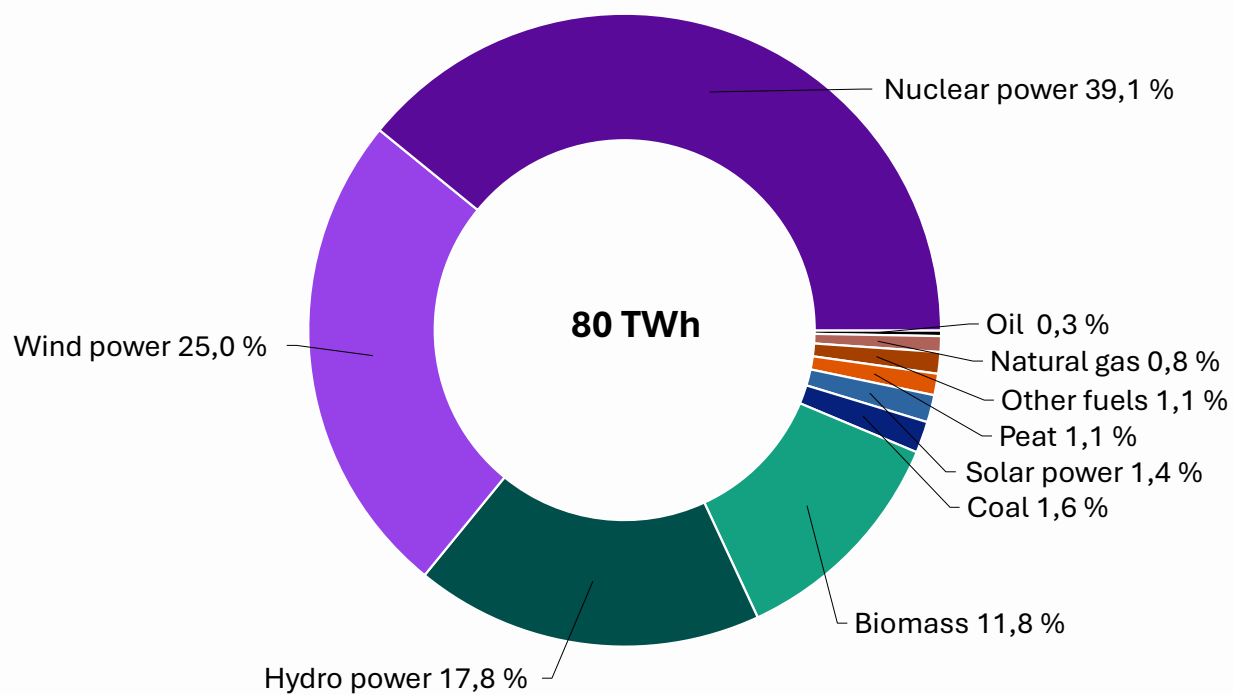
Change of Industrial Electricity Consumption 2023-2024



Electricity by energy source and net imports 2024



The share of CO2-neutral electricity 95 percent

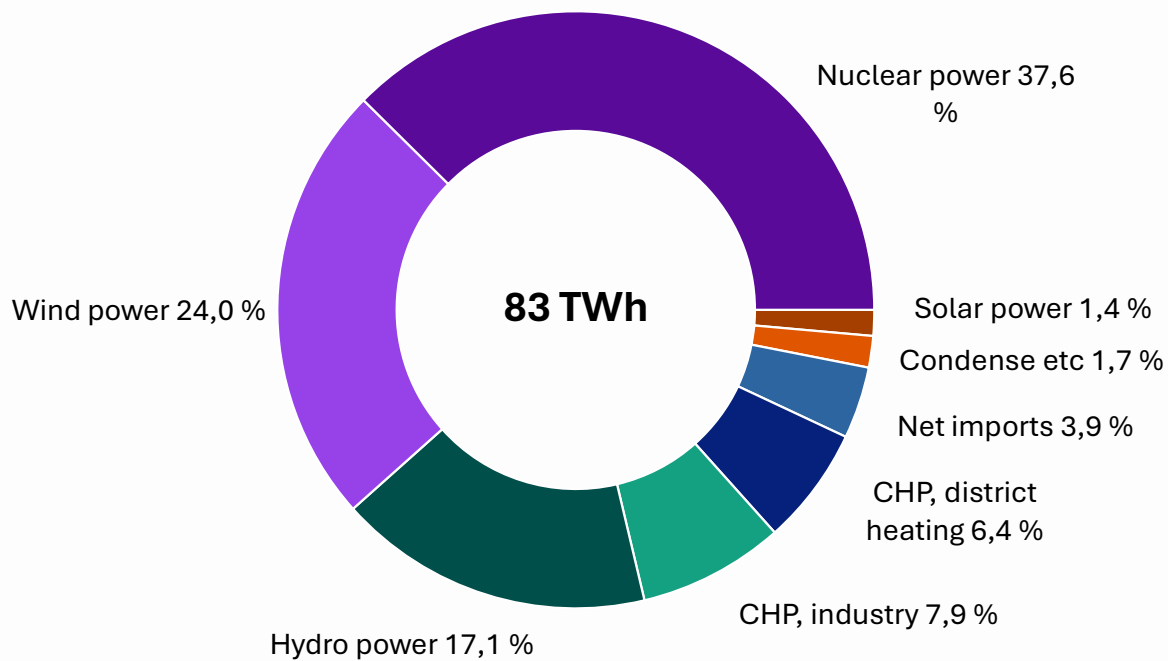


- Renewable: 56 % (52 % in year 2023)
- CO2-neutral*: 95 % (94 % in year 2023)
- Domestic: 57 % (54 % in year 2023)

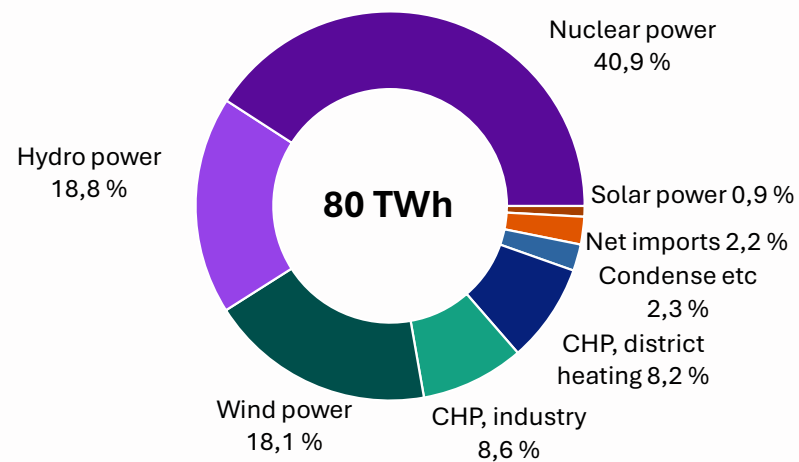
*CO2-neutral energy sources are energy sources whose carbon dioxide impact is not reported in electricity production. The climate impact of biomass is calculated in the land use sector.

Electricity production in Finland and net imports

2024

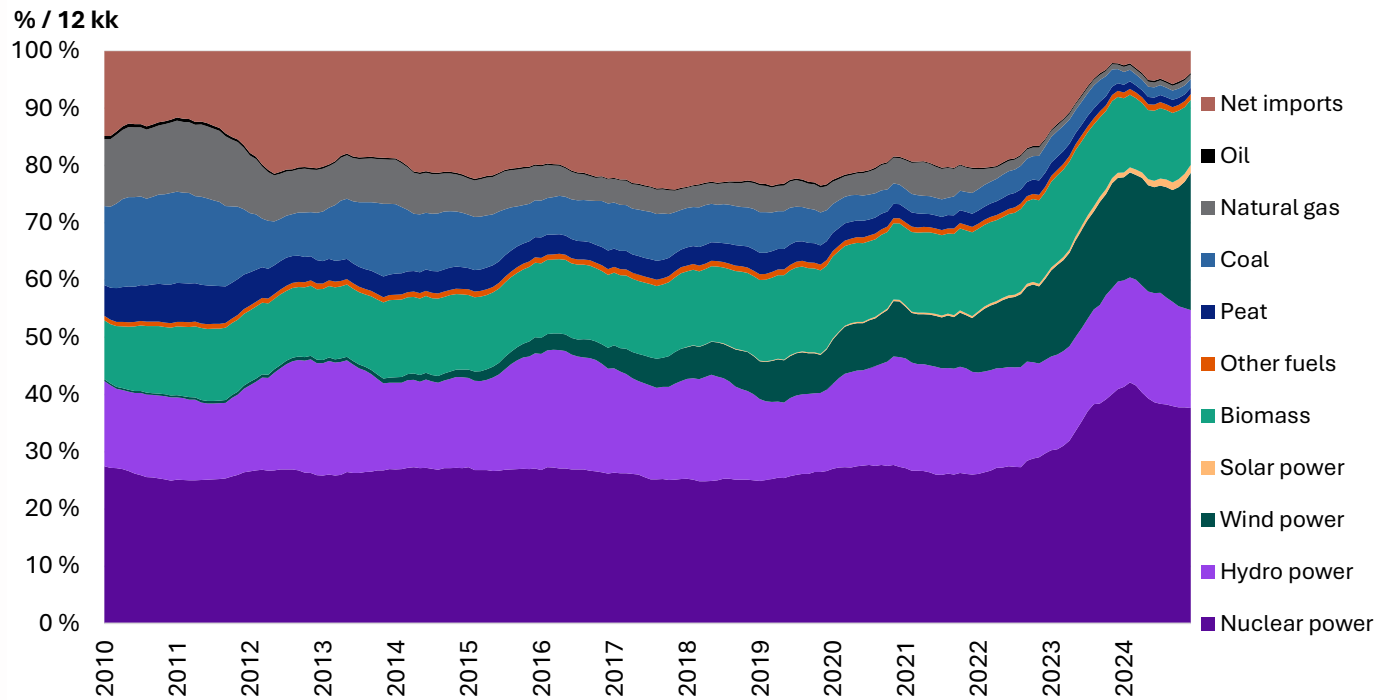


2023

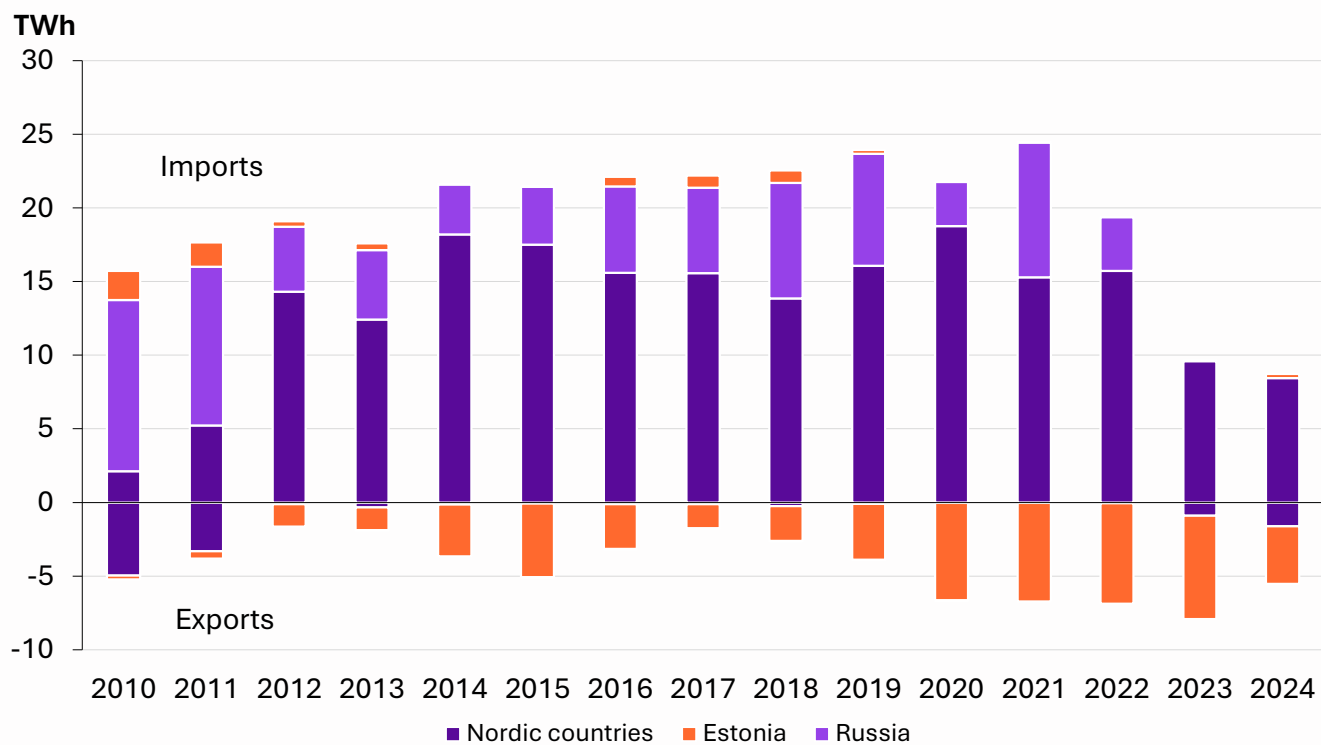


Fossil fuels have been replaced by renewables

Moving 12 months electricity production, % of consumption

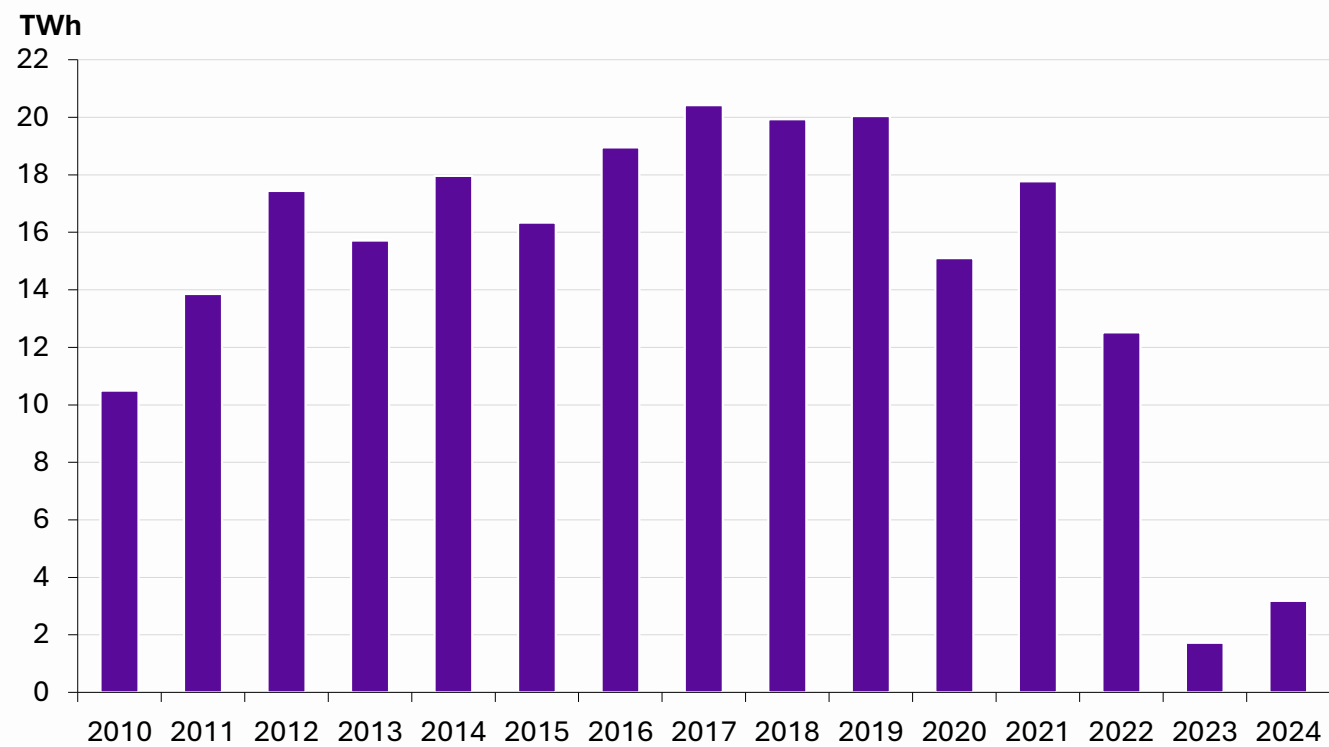


Net imports of electricity increased 84 percent (+1.5 TWh)

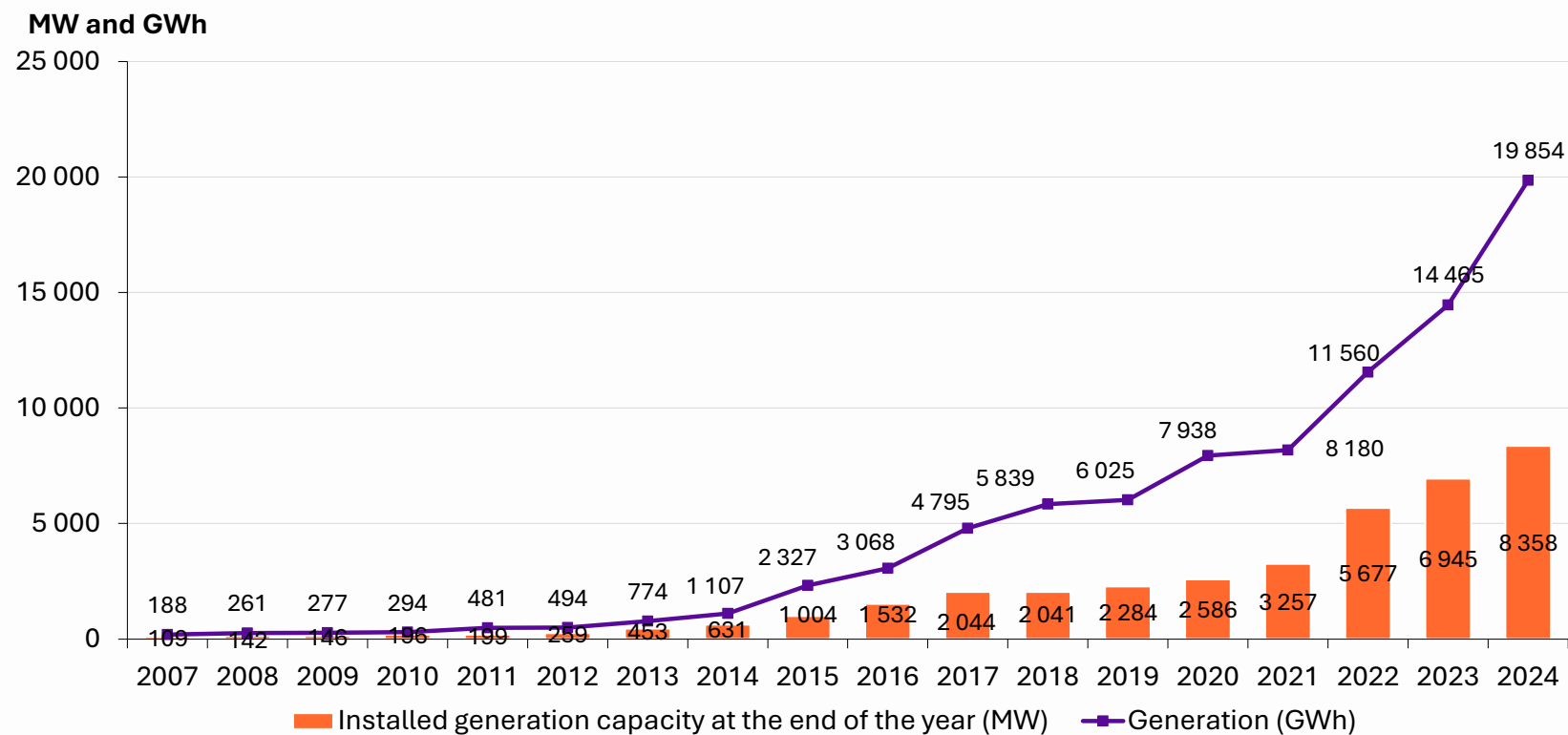


- Imports decreased 10 % and exports 30 %
- Imports from Nordics decreased 12 %
- Exports to Estonia decreased 44 % but imports to Nordics increased 80 %

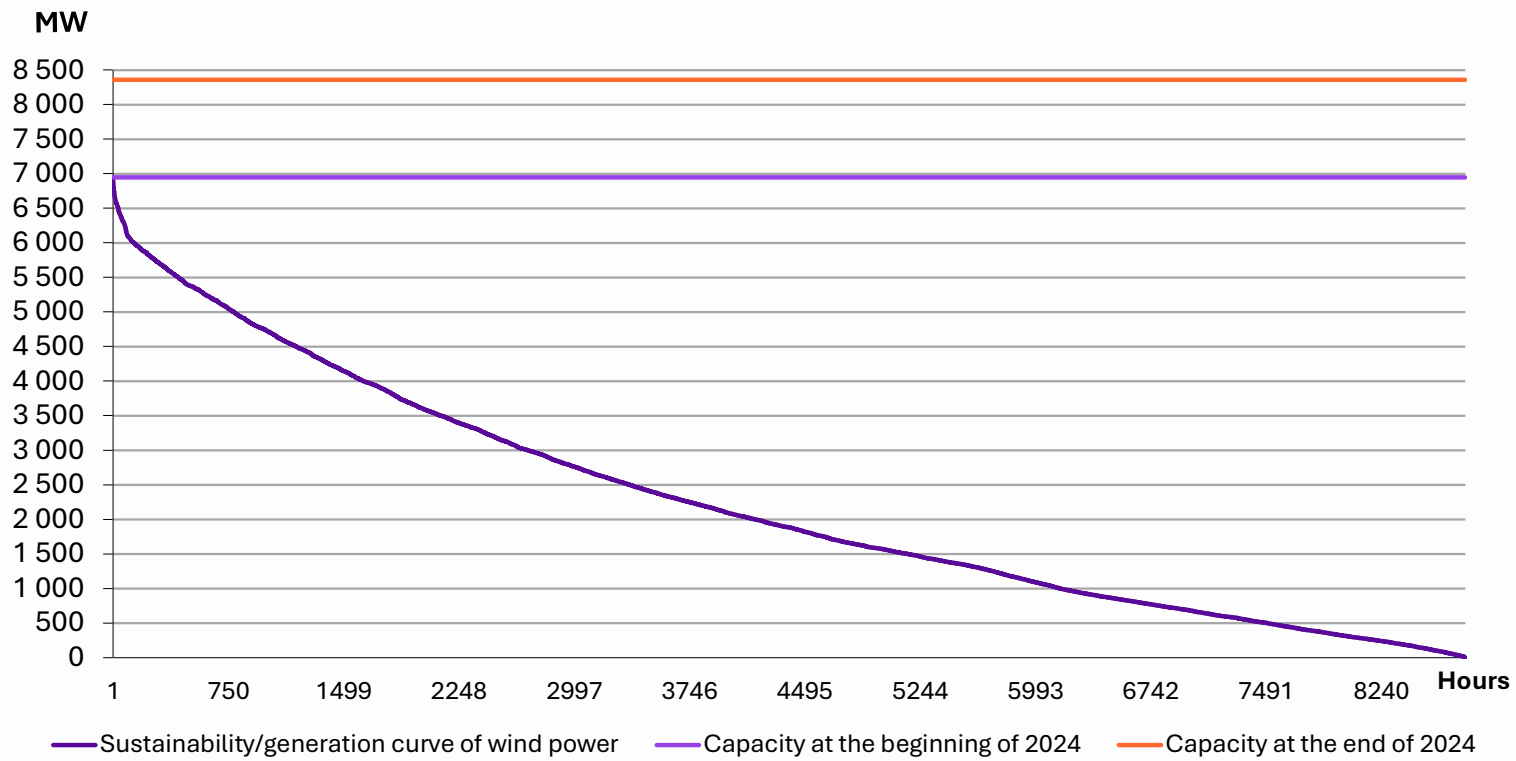
Net imports of electricity 2024 (3.2 TWh)



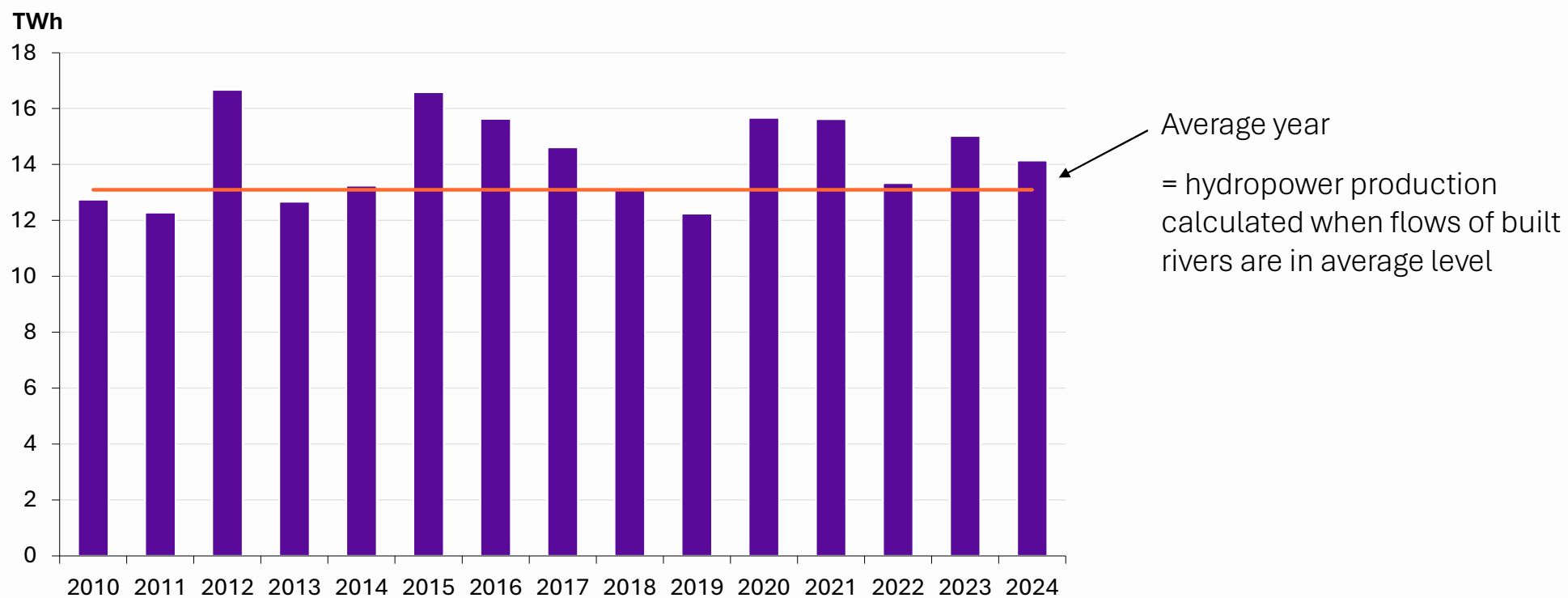
Wind power generation increased 37 % in 2024



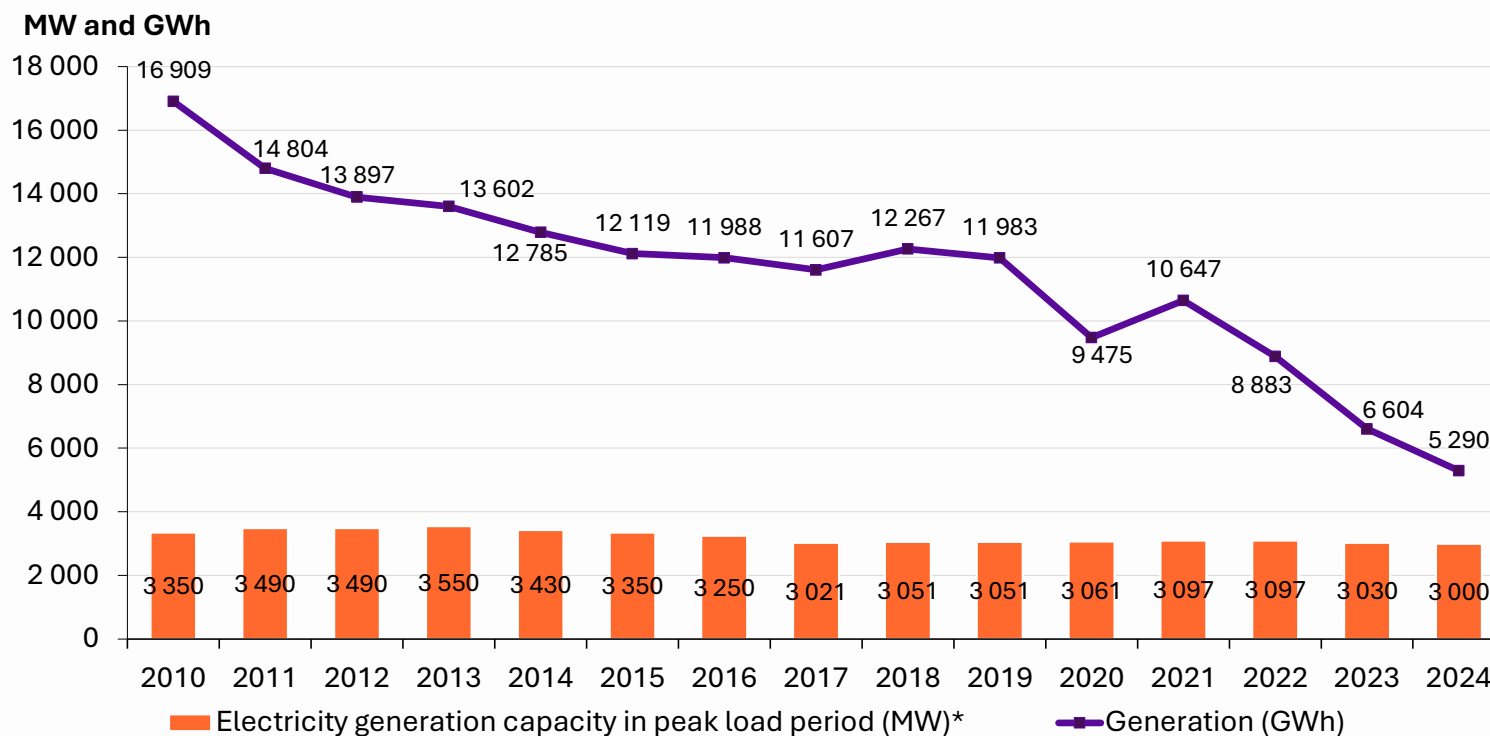
Sustainability curve of wind power



Hydro power generation



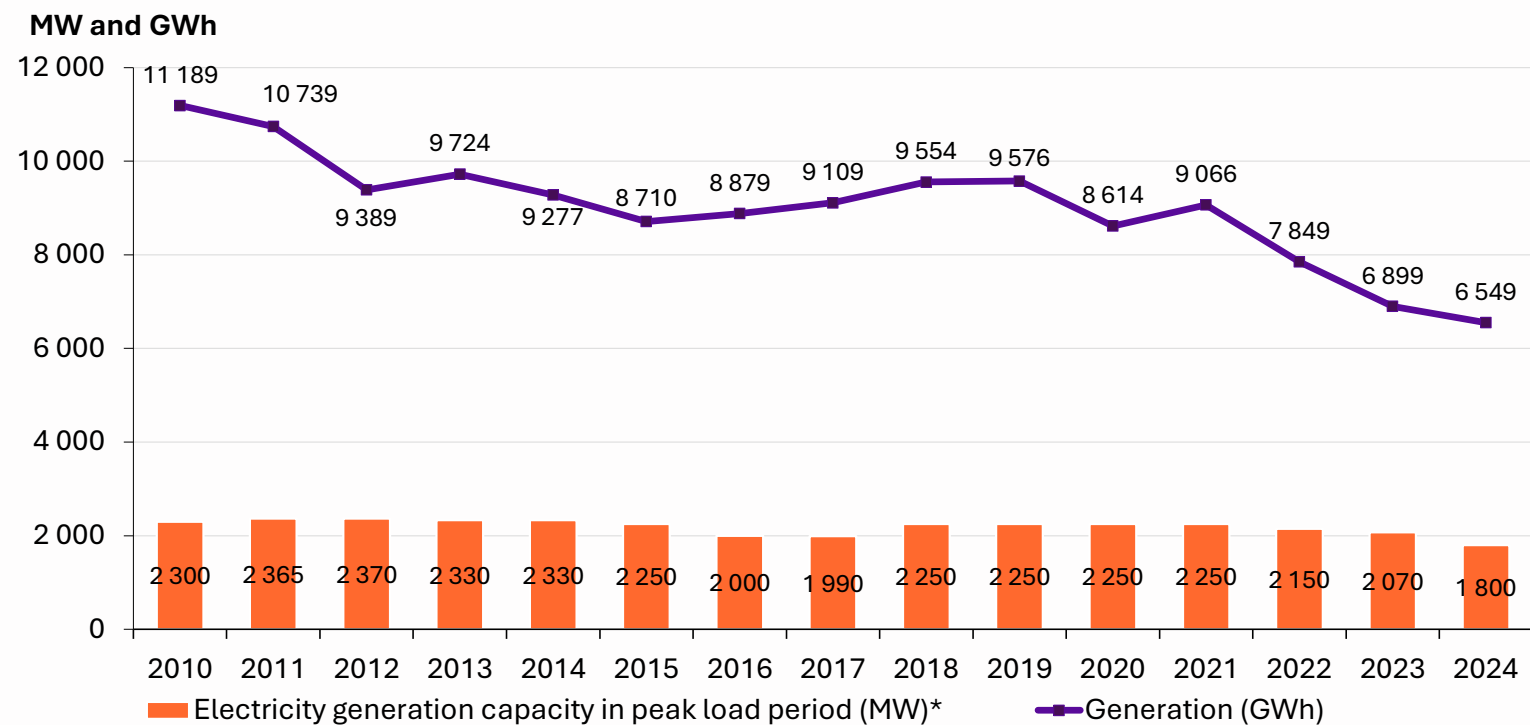
Generation and capacity of CHP in district heating



*Peak load capacity is not included from year 2017

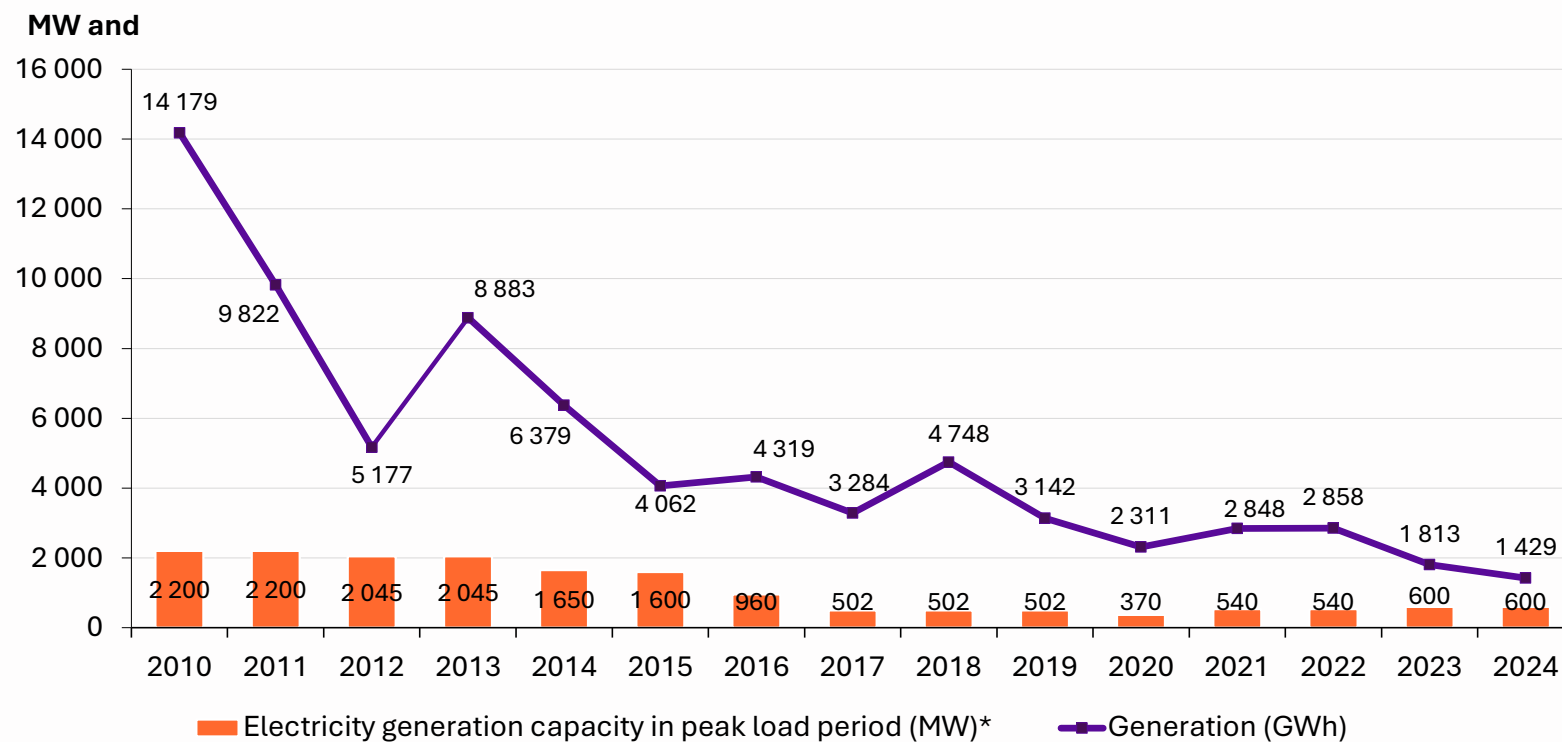
*Source: Statistics Finland, Energy 2023 table service, table 3.5

Generation and capacity of CHP in industry



*Source: Statistics Finland, Energy 2023 table service, table 3.5

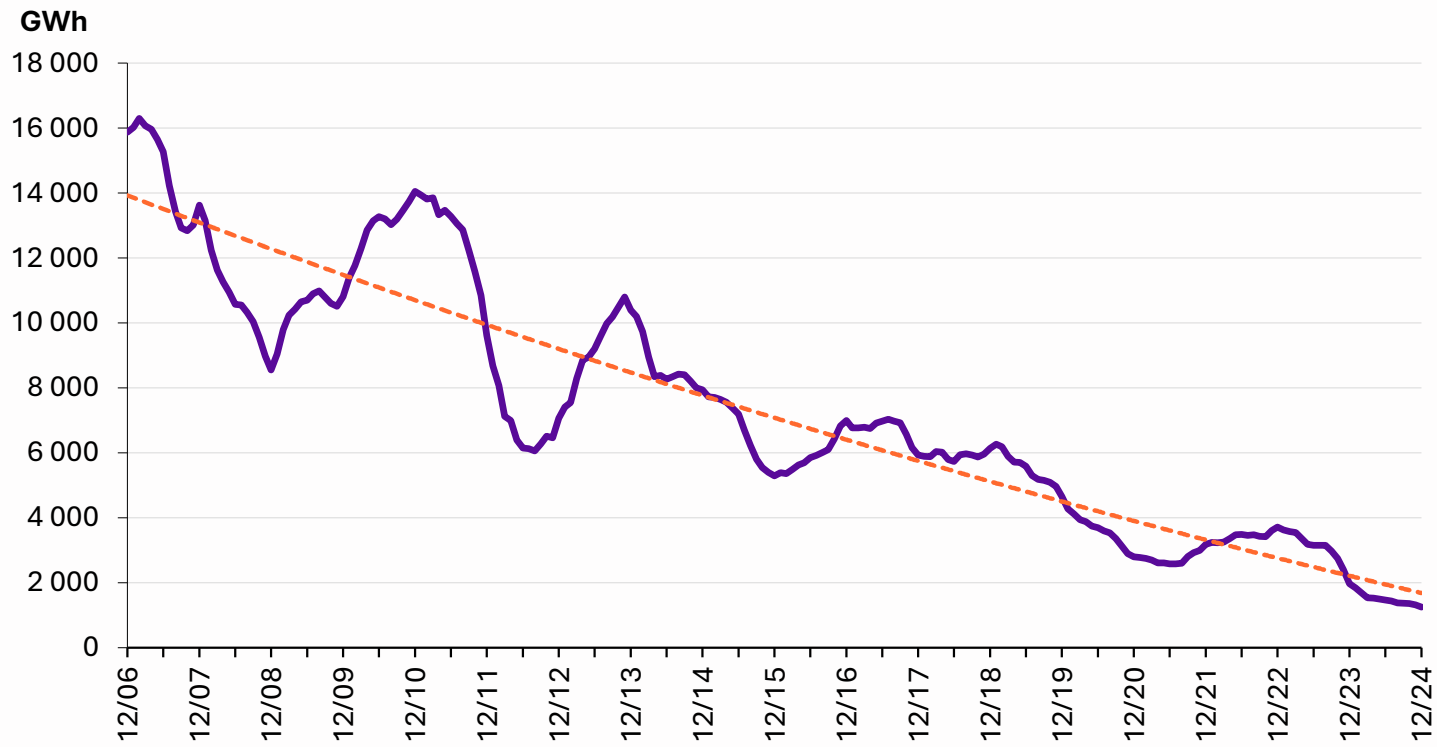
Generation and capacity of condensing power



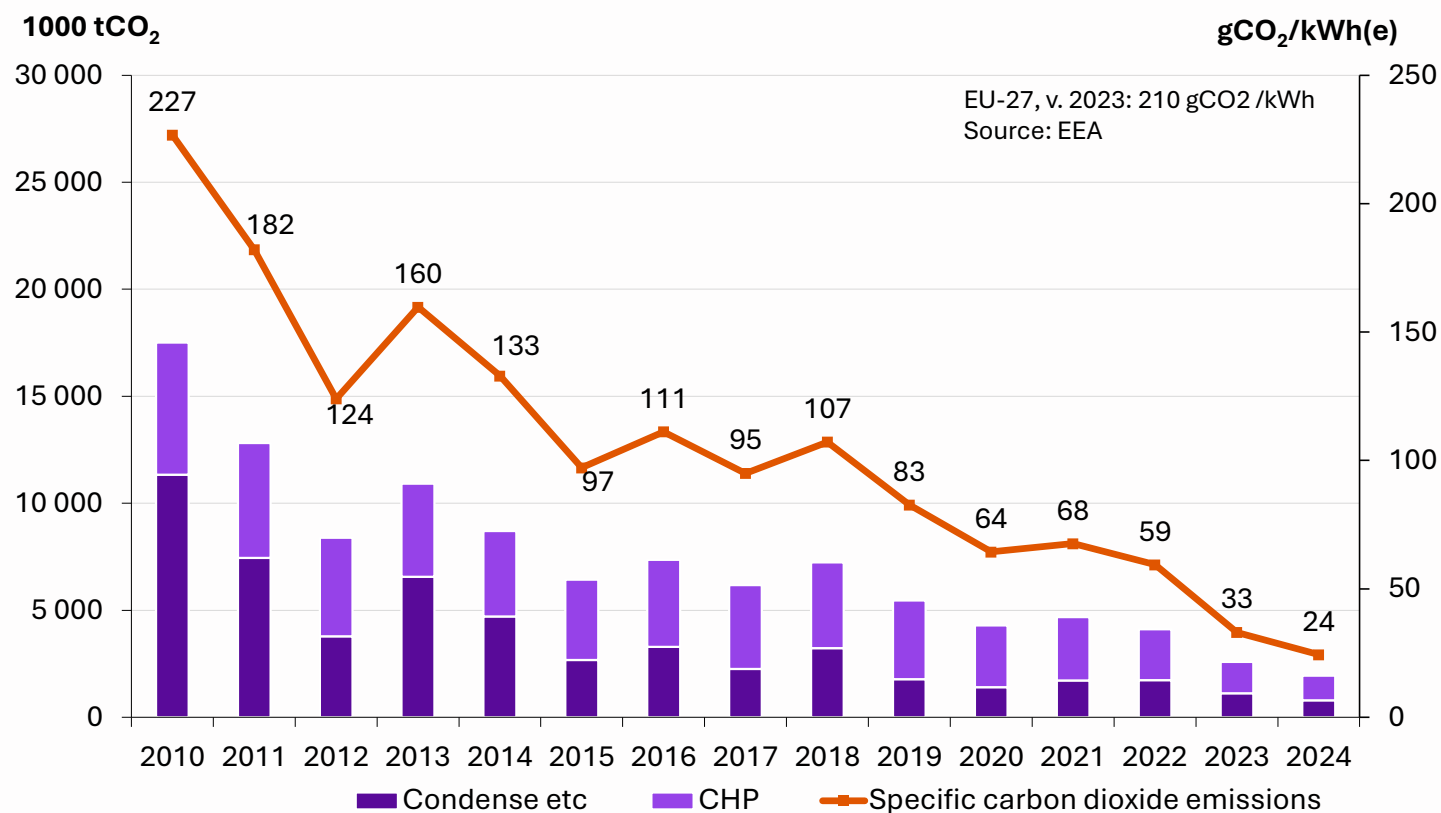
*Peak load capacity is not included from year 2017

*Source: Statistics Finland, Energy 2023 table service, table 3.5

Electricity Generation with Coal, total of moving 12 months



CO2-emissions of power generation have collapsed



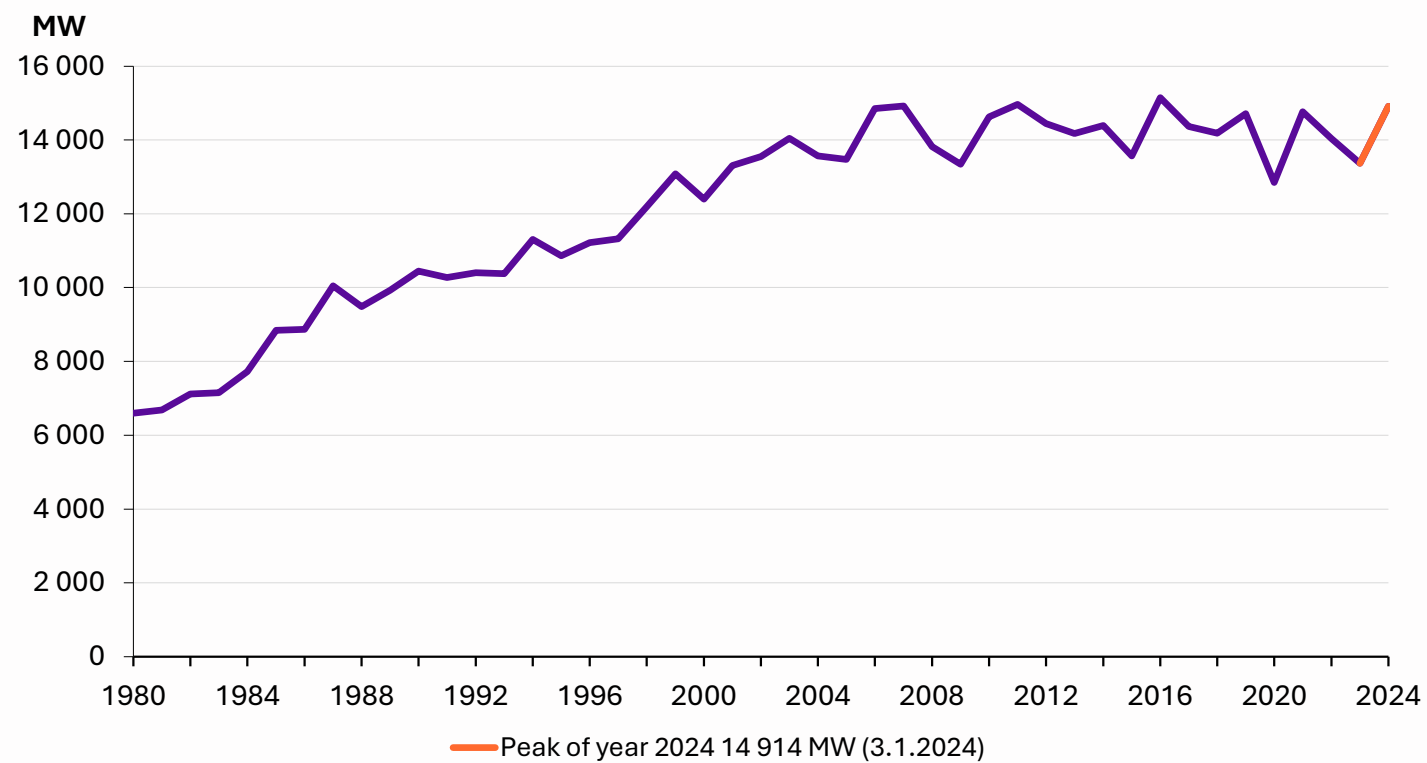
CO2-emissions of power generation:

- 1.9 Mt in year 2024
- 2.6 Mt in year 2023
- 4.1 Mt in year 2022
- 6.4 Mt in year 2015
- 18 Mt in year 2010

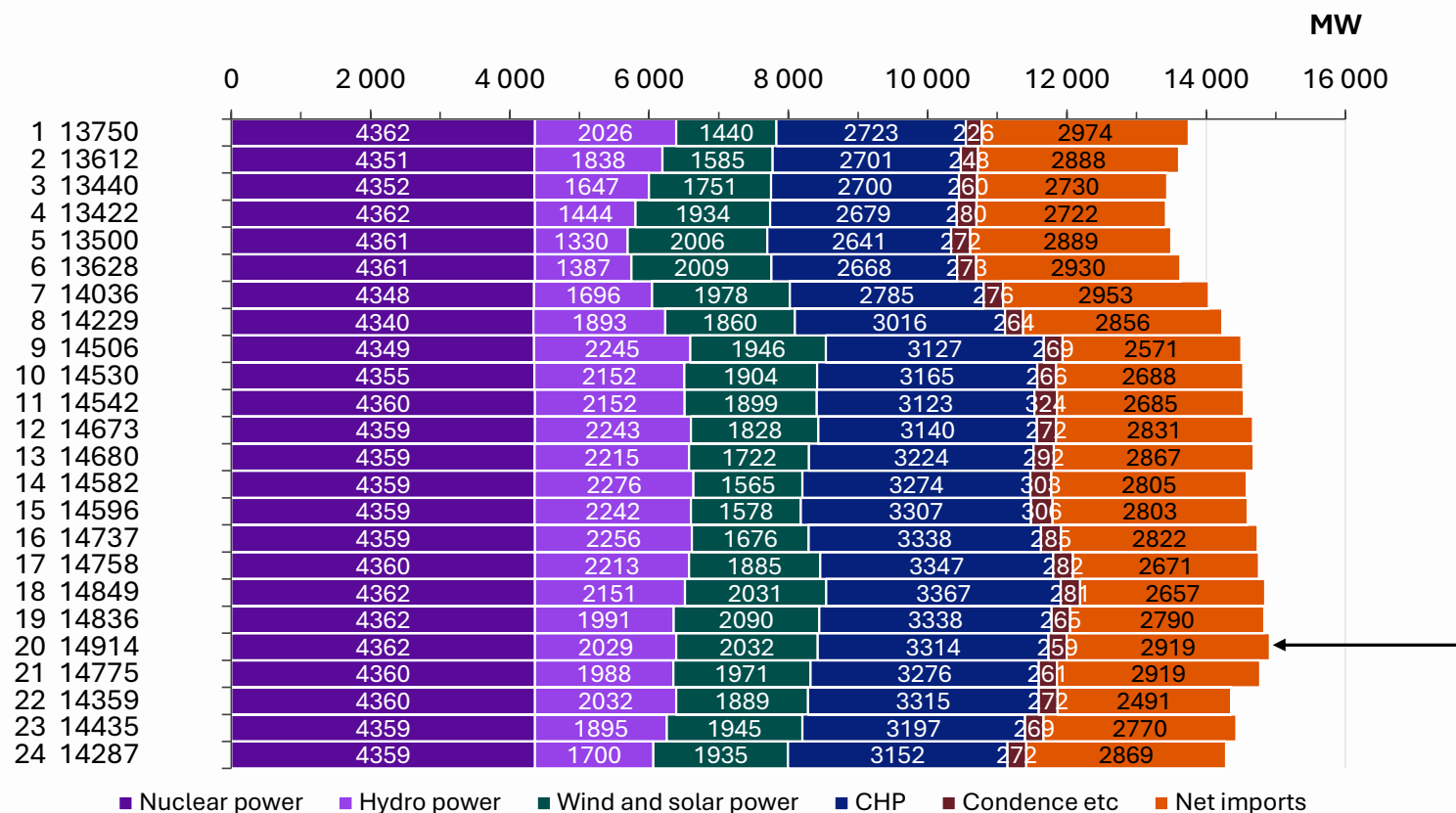
- 2023 vs. 2022 -25 %
- Emissions -55 % in last 5 years
- Emissions -89 % vs 2010

Peak loads of electricity

Maximum electricity power /hour



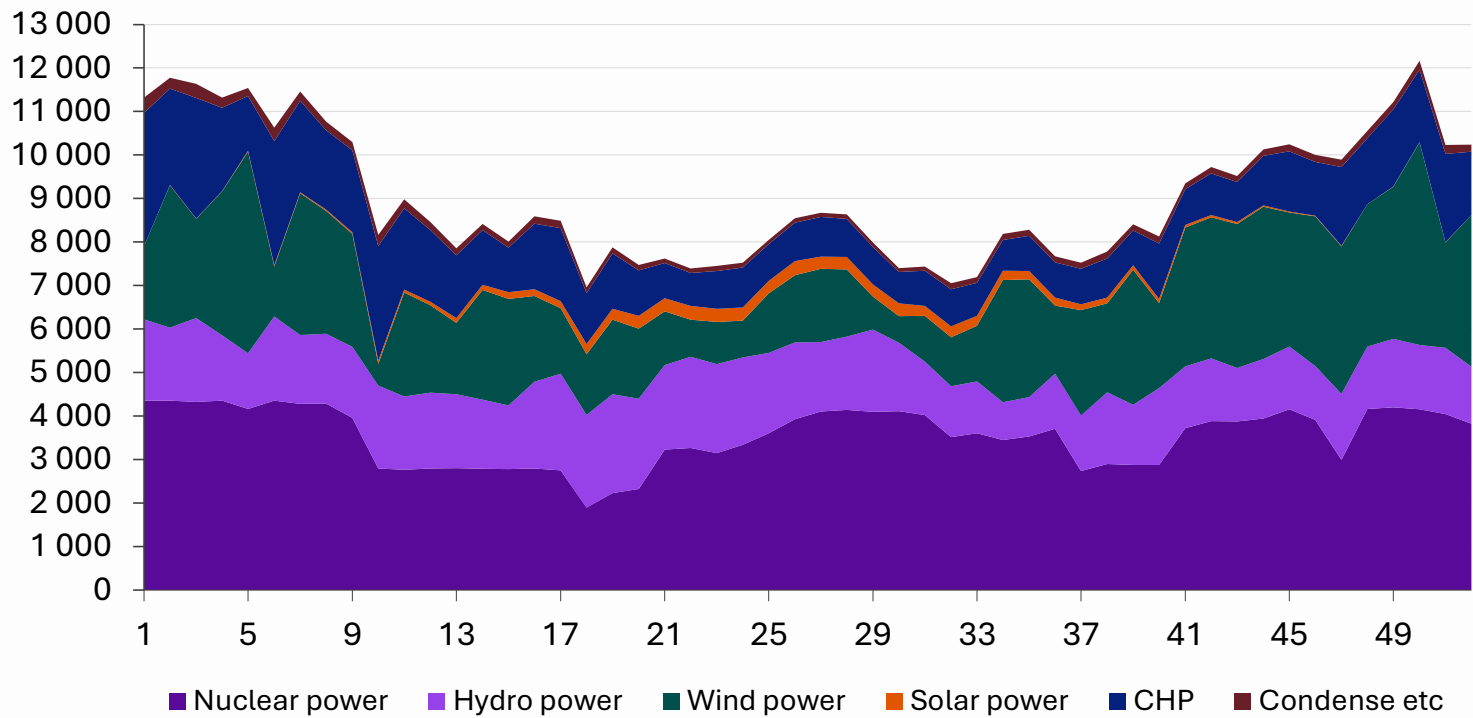
Electricity supply hourly in year 2024 peak load day 3.1.



Variation of Electricity Production in 2024

Average week power

MW /week

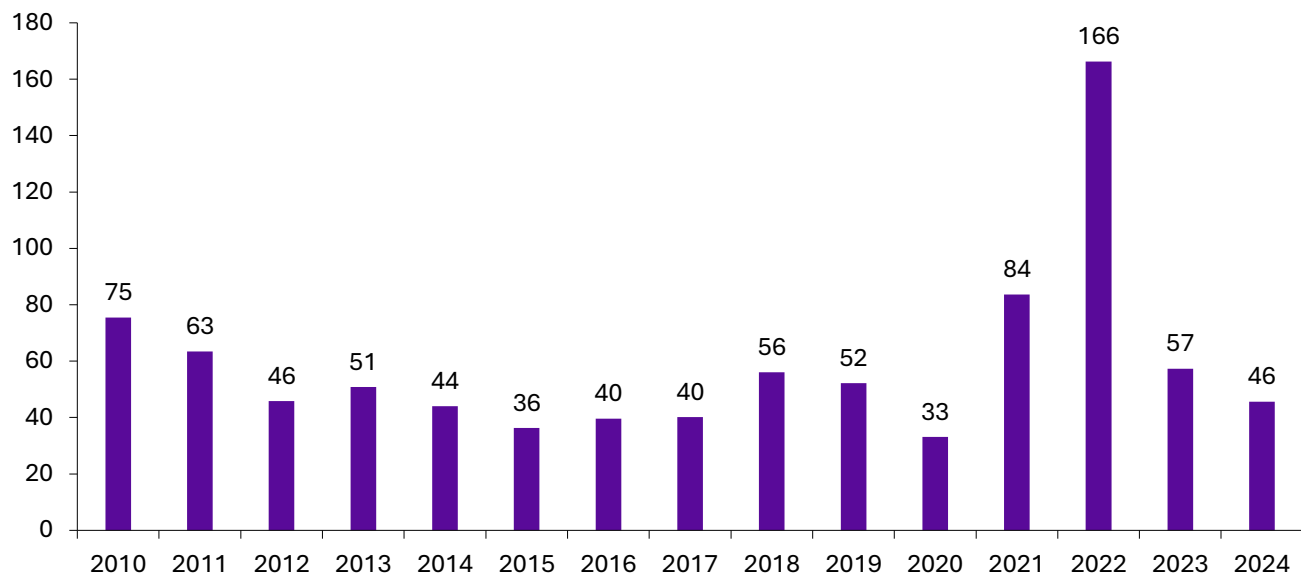


Electricity price statistics 2024

The development of annual prices in Finland relative to the Consumer price Index

The inflation-adjusted wholesale electricity price in Finland

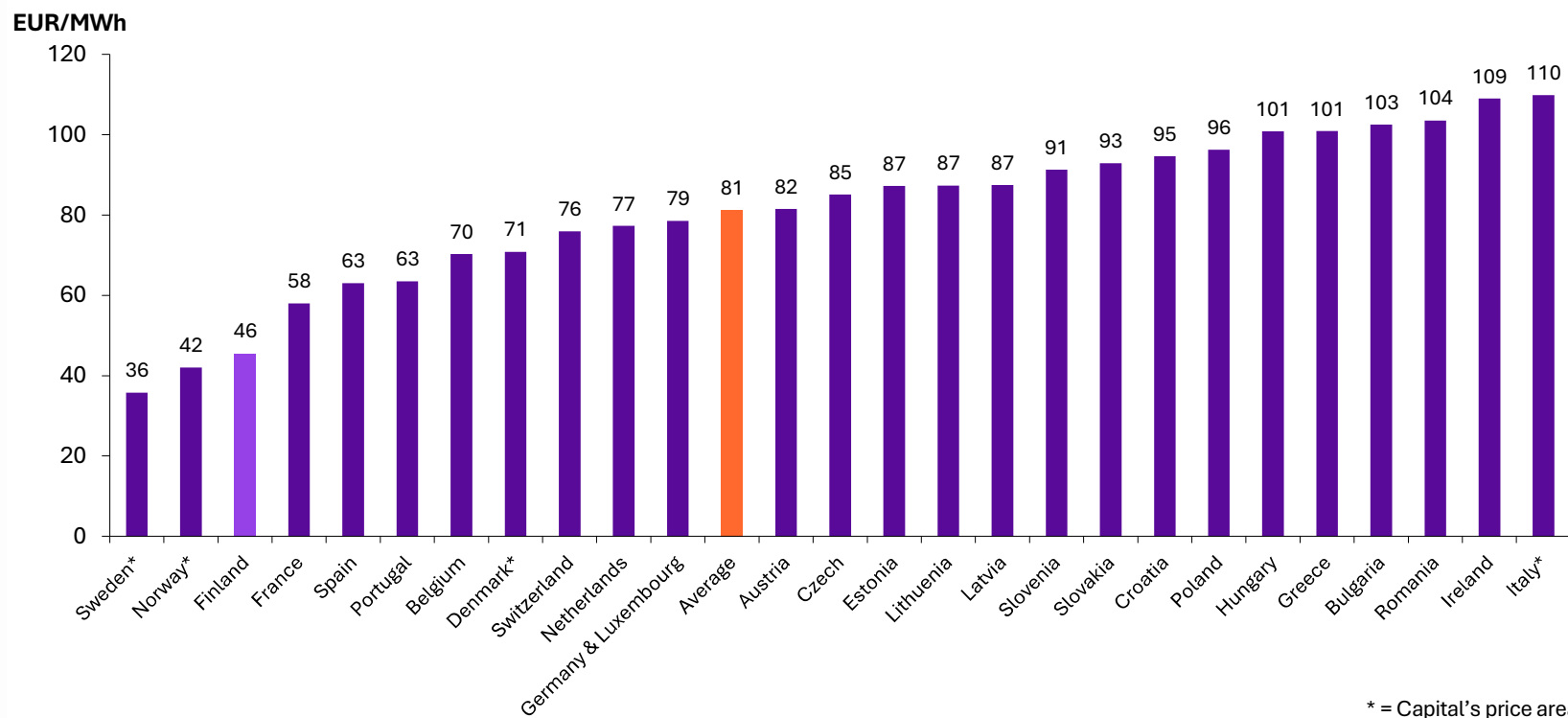
EUR/MWh



Data: Nord Pool & Tilastokeskus

Finland has the second lowest electricity prices in Europe

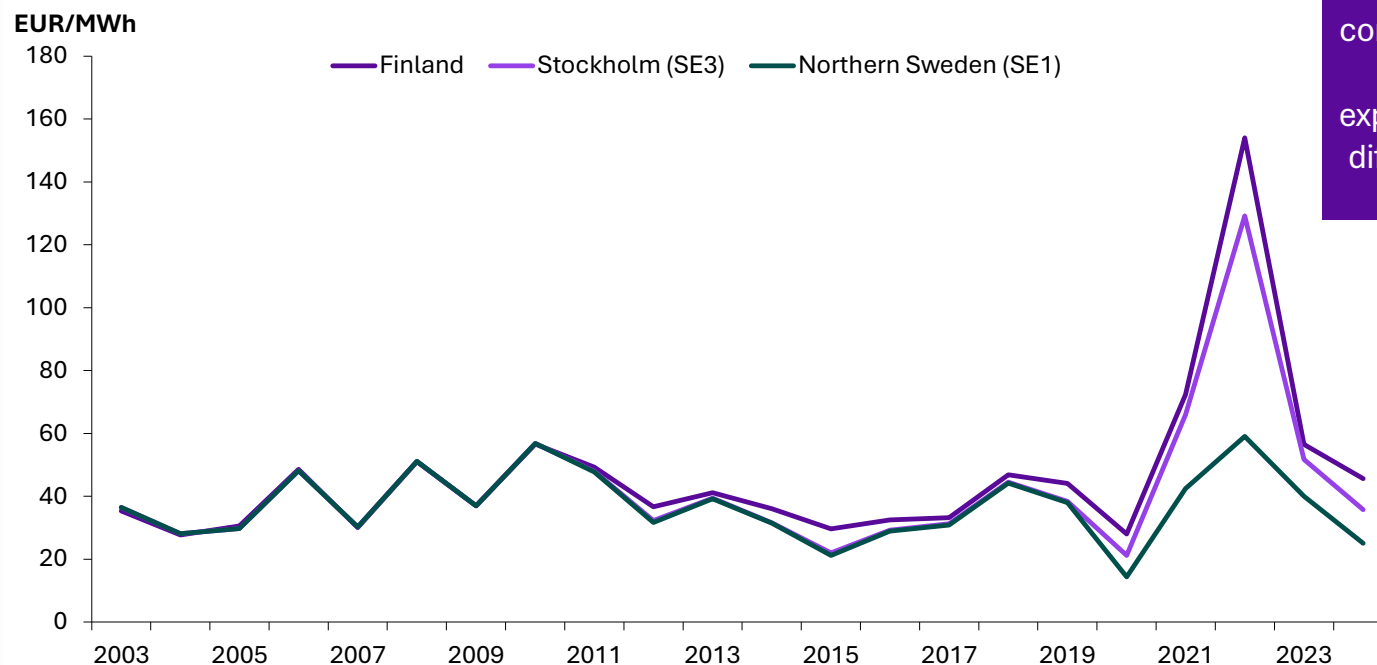
Electricity wholesale prices in year 2024 (EU + Norway ja Switzerland)



Data: Energy-Charts

Price differentials between regions have increased, with Finland following Stockholm

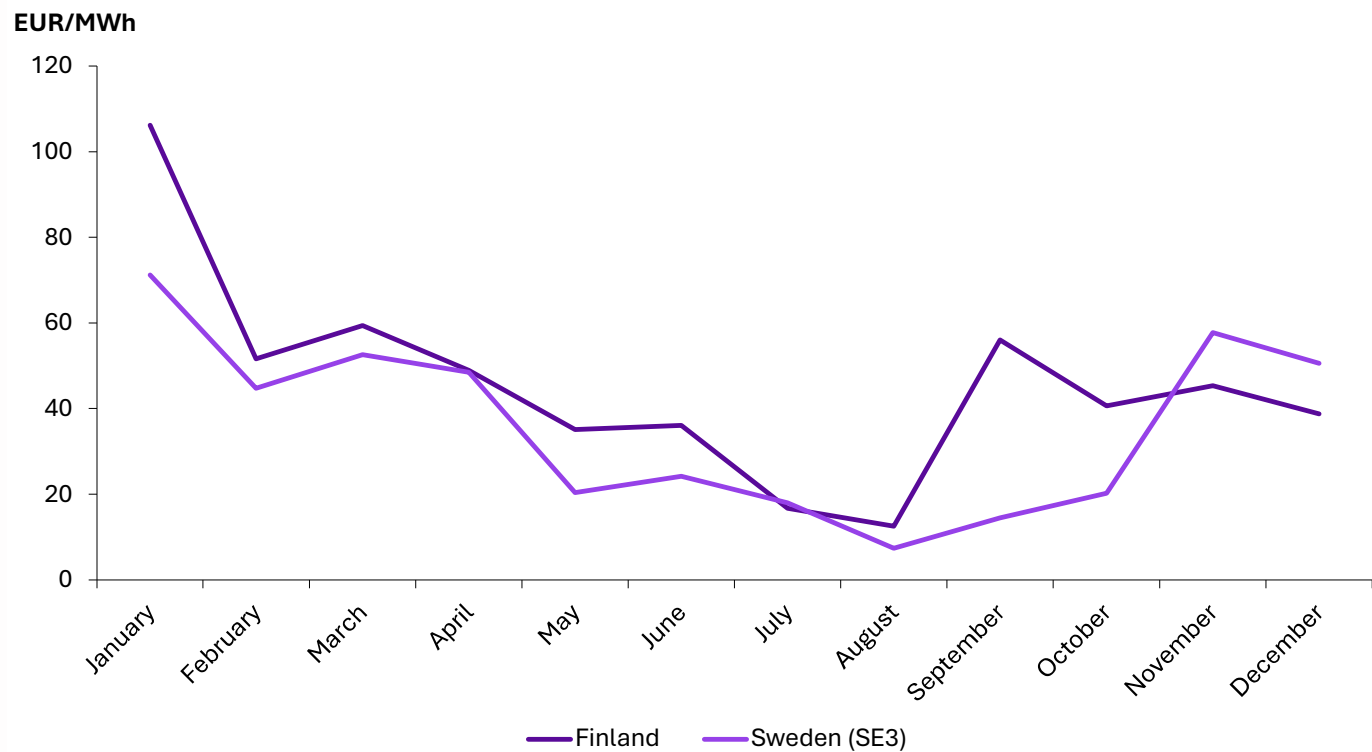
Electricity wholesale prices in the Finnish and Swedish (SE1 & SE3) price areas annually



The Aurora 1 transmission connection, scheduled to be completed in 2025, is expected to reduce the price difference between Finland and Northern Sweden.

SE1 & SE3 between years from 2003 to 2011 = The price of Sweden before splitting the country into four bidding zones
Data: Nord Pool

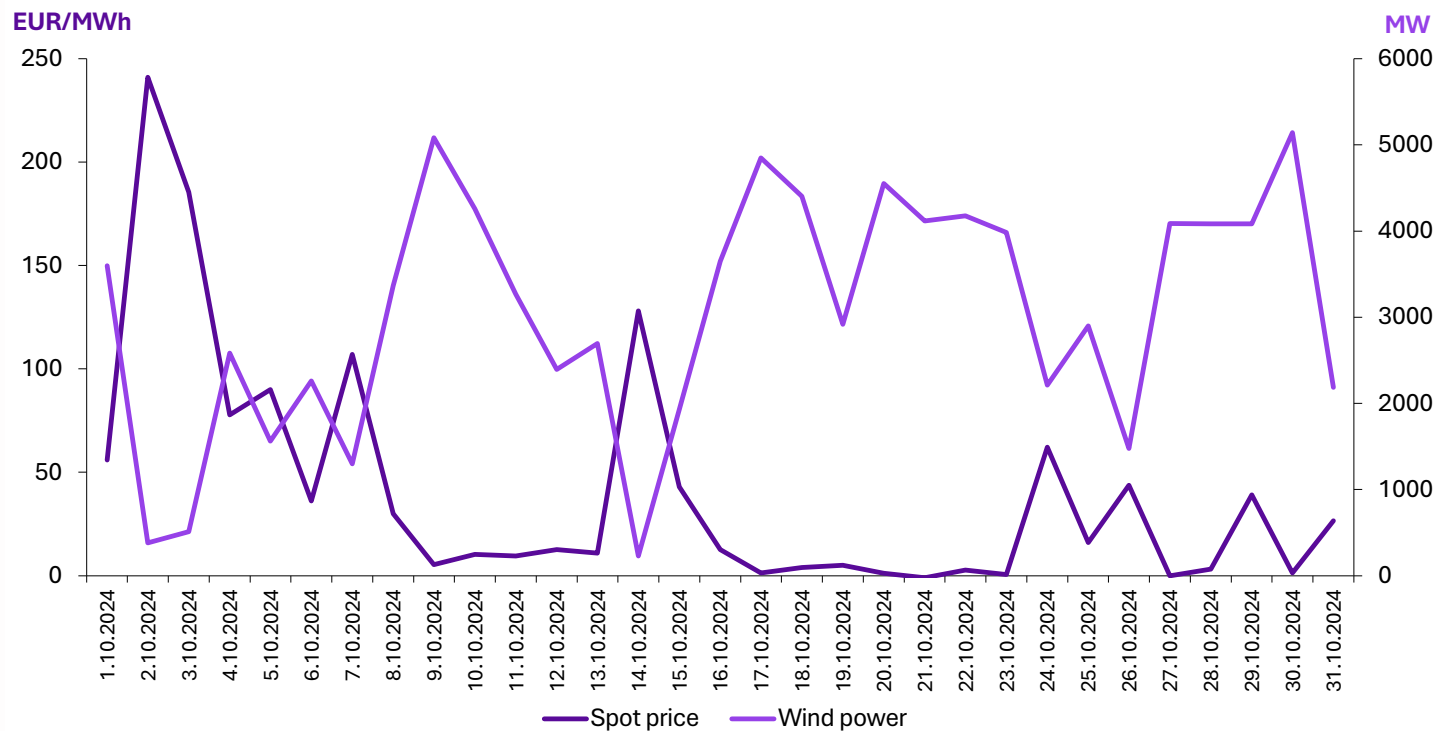
Price gap to Sweden monthly in year 2024



Data: Nord Pool

The connection of wind power to the price

October wind power production & wholesale price of electricity (daily averages)

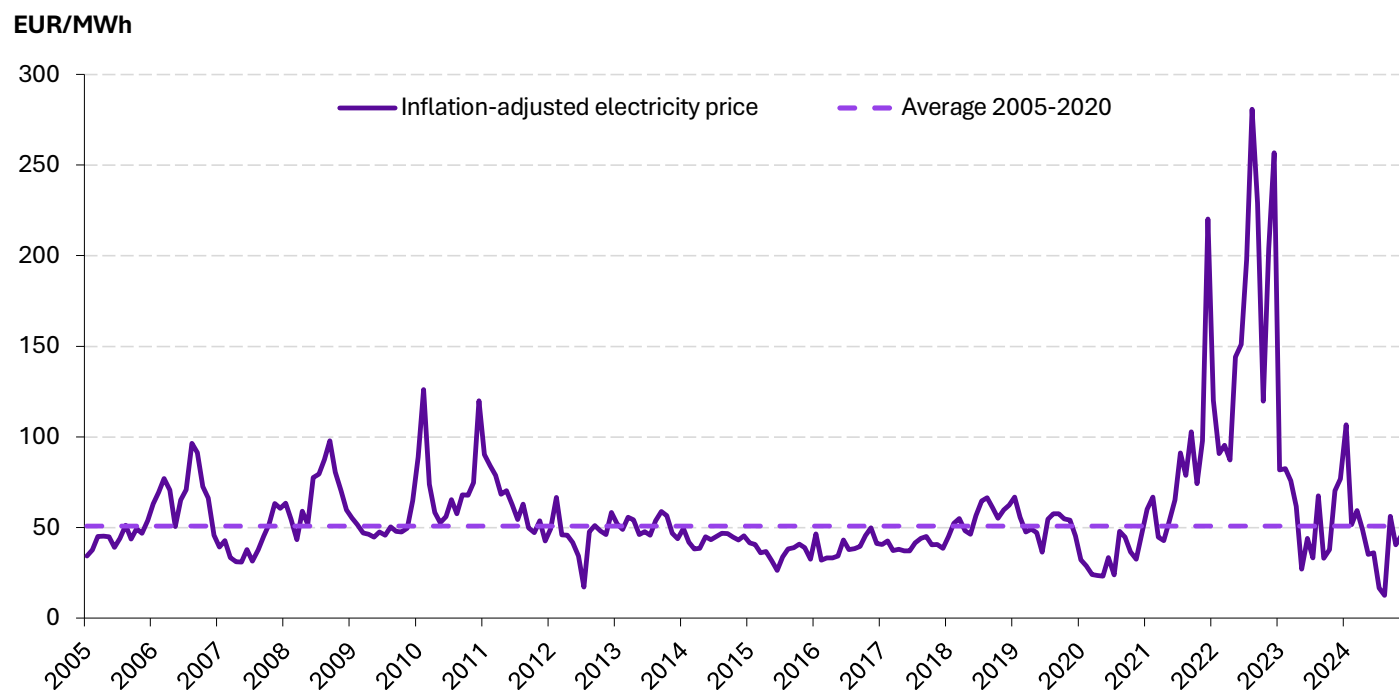


- On windy days the price of electricity is often close to zero, on days with little wind the price is higher
- The amount of wind power is the biggest factor affecting prices, but many other factors also affect prices:
 - Regarding demand, e.g. day of the week, time of day, heating demand, industrial occupancy rate, etc.
 - Regarding supply, e.g. availability of power plants and border lines, fuel and emission costs, water situation, etc.

Data: Entso-e & Energiateollisuus

The development of the inflation-adjusted wholesale electricity price

The inflation-adjusted wholesale electricity price in Finland monthly

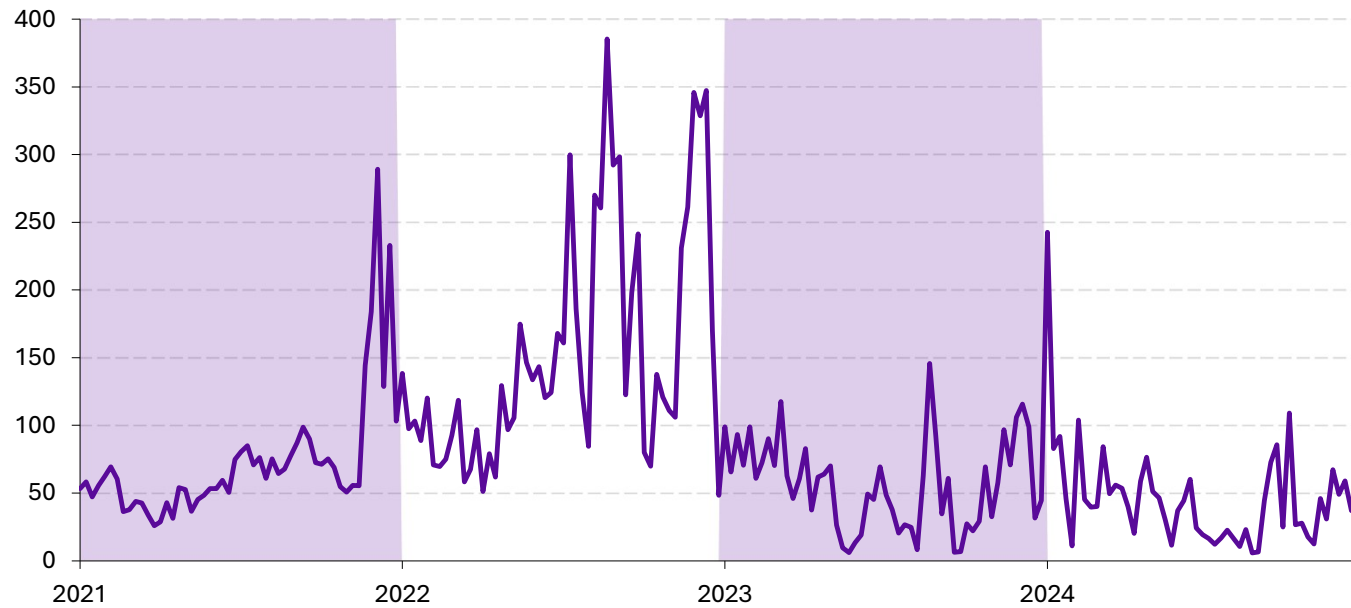


Data: Nord Pool & Statistics Finland

Weekly prices of electricity in 2021 to 2024

Wholesale electricity prices in Finland weekly

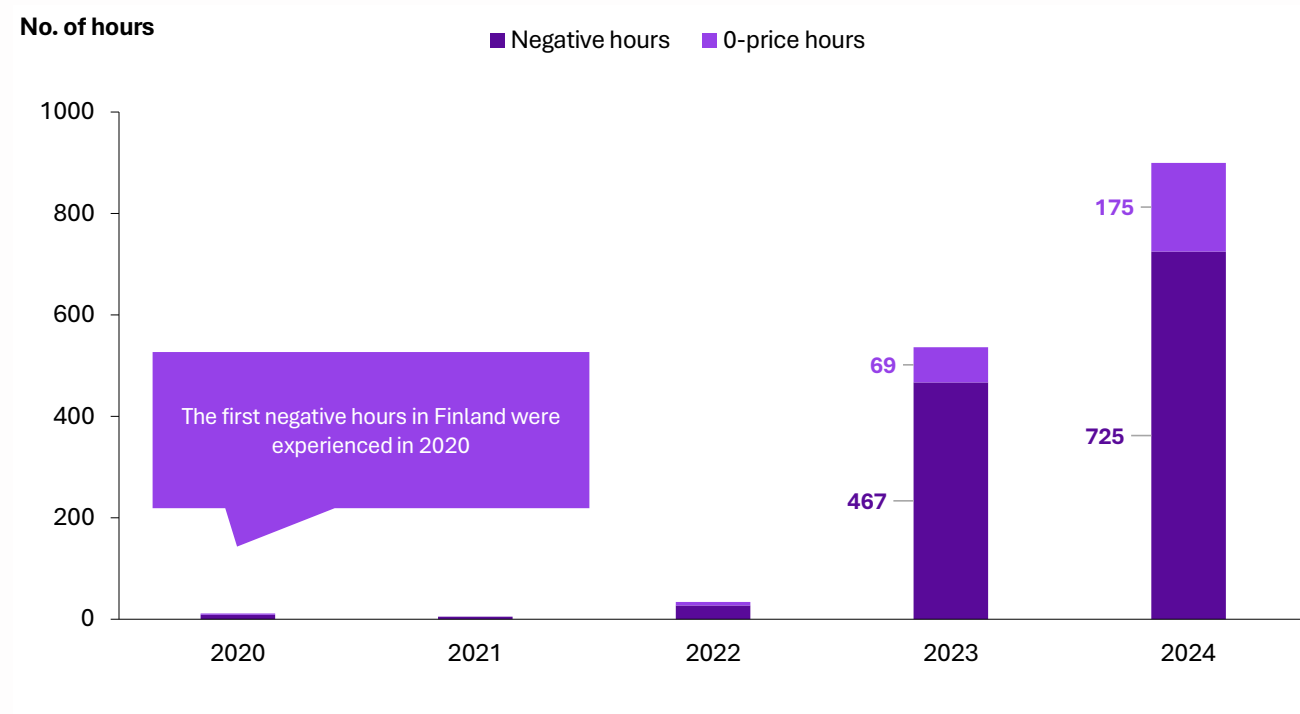
EUR/MWh



Data: Nord Pool

The amount of hours with negative or zero price has grown sharply

The number of hours of negative and 0-price electricity prices in Finland

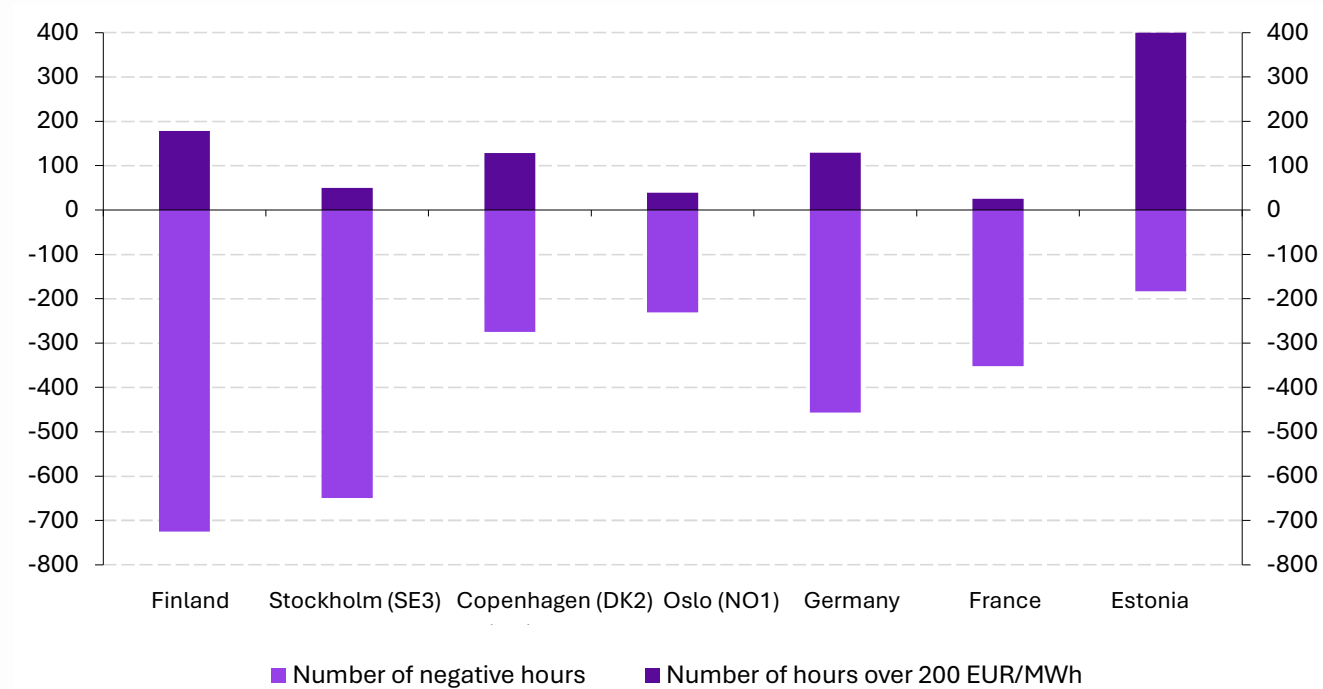


Data: Entso-e

- The number of negative electricity prices has significantly increased due to the rapid growth of wind power.
- Low and negative electricity prices incentivize investments in flexible demand, such as batteries and electric boilers – electricity capacity of electric boilers connected to district heating networks soon exceeding 1 GW.
- About 10 % of the year's hours are either negative or zero-priced

Negative hours and price spikes are not just a Finnish phenomenon

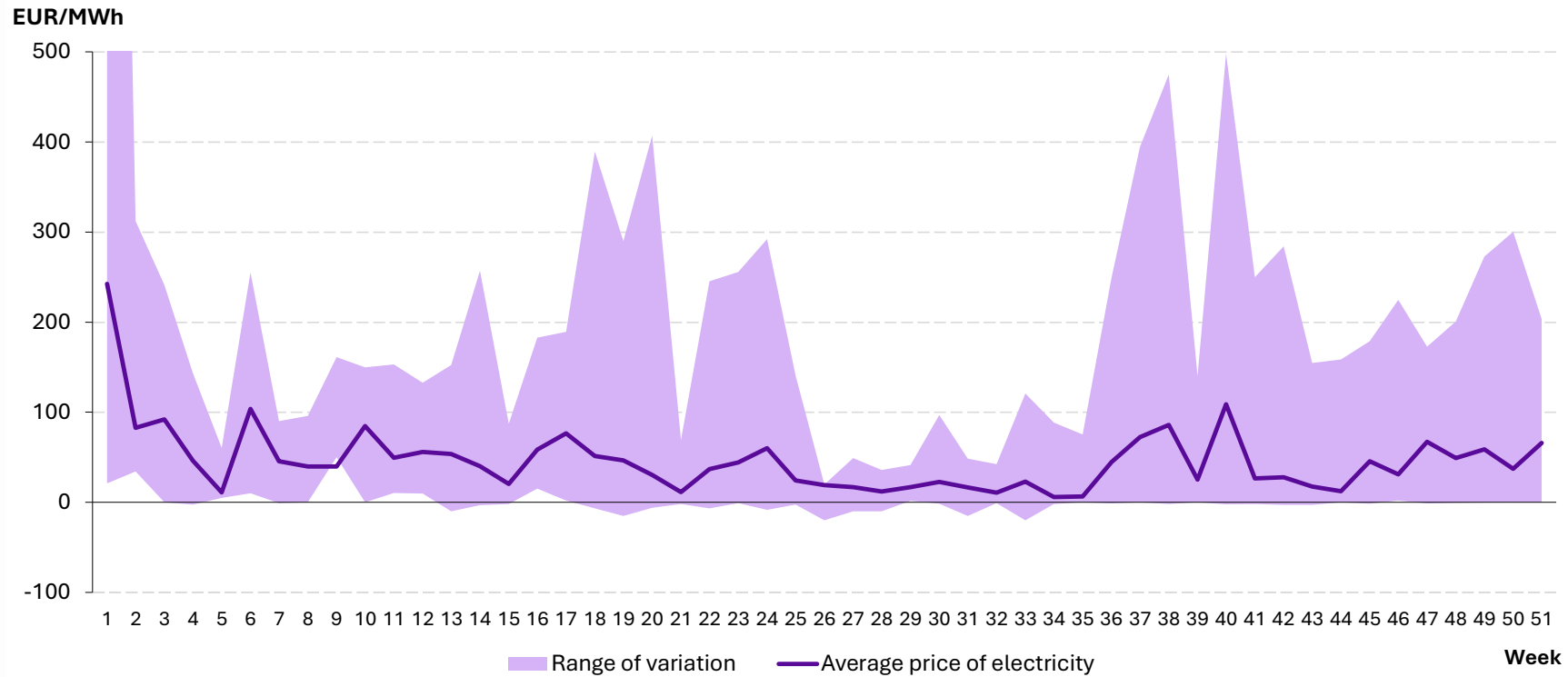
The number of hours of high and negative electricity prices in 2024



Data: Entso-e & Nord Pool

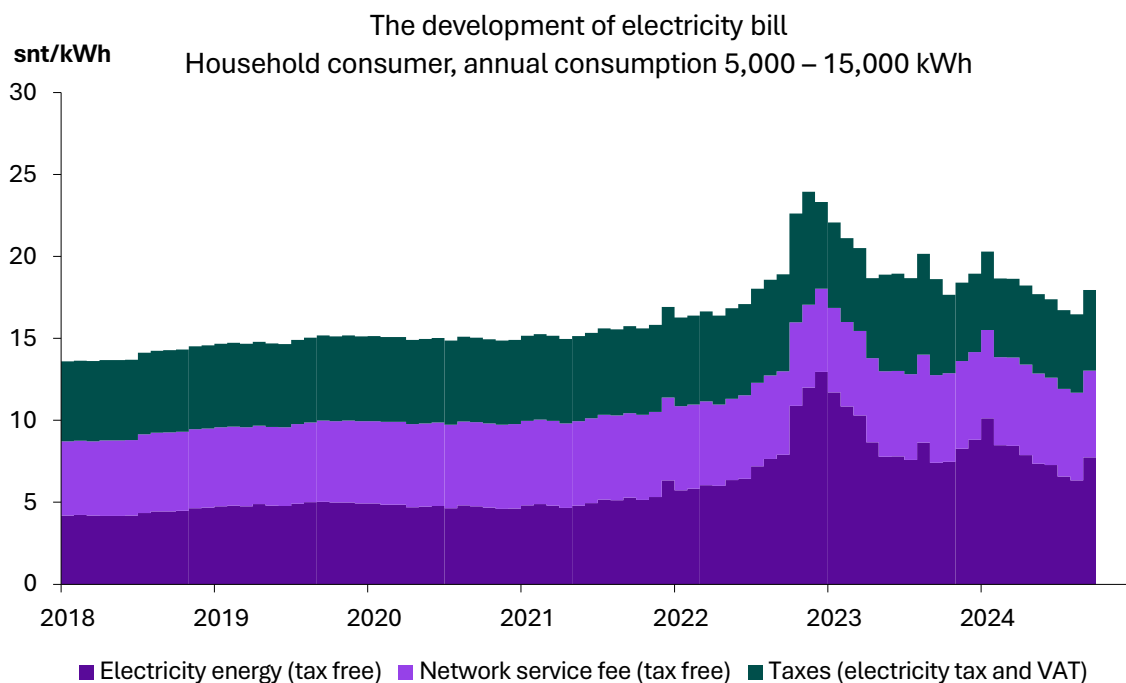
On average, electricity is cheap, but the price varies widely

Weekly average price & weekly maximum and minimum price range



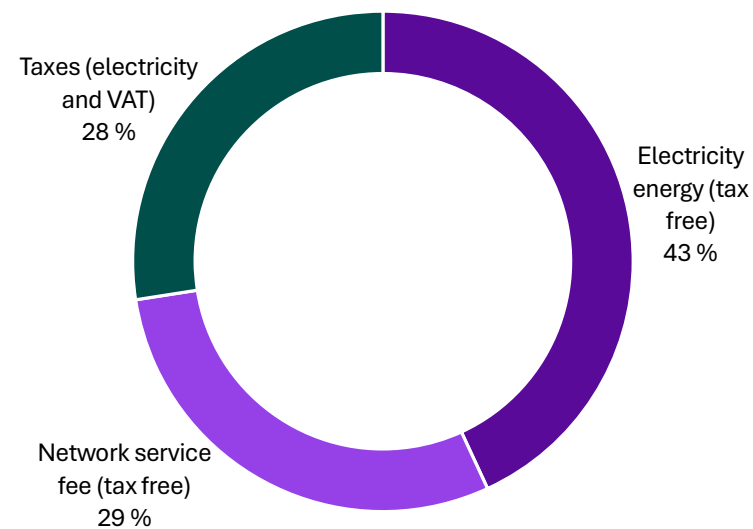
Data: Entso-e

Consumers' electricity bills have significantly decreased over the past year



Data: Statistics Finland

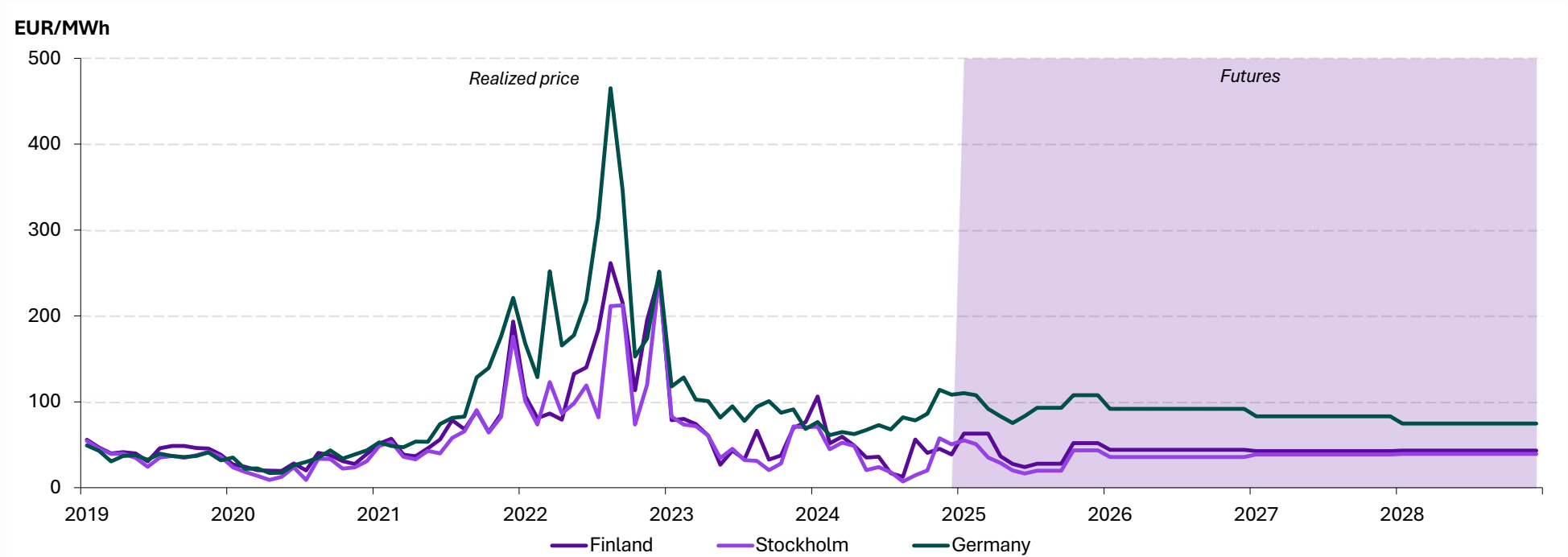
The shares of different components in the electricity bill for a household customer with an annual consumption of 5,000 – 15,000 kWh



Data: Statistics Finland

Electricity price outlook: Prices in Finland and Sweden are significantly cheaper than in Central Europe

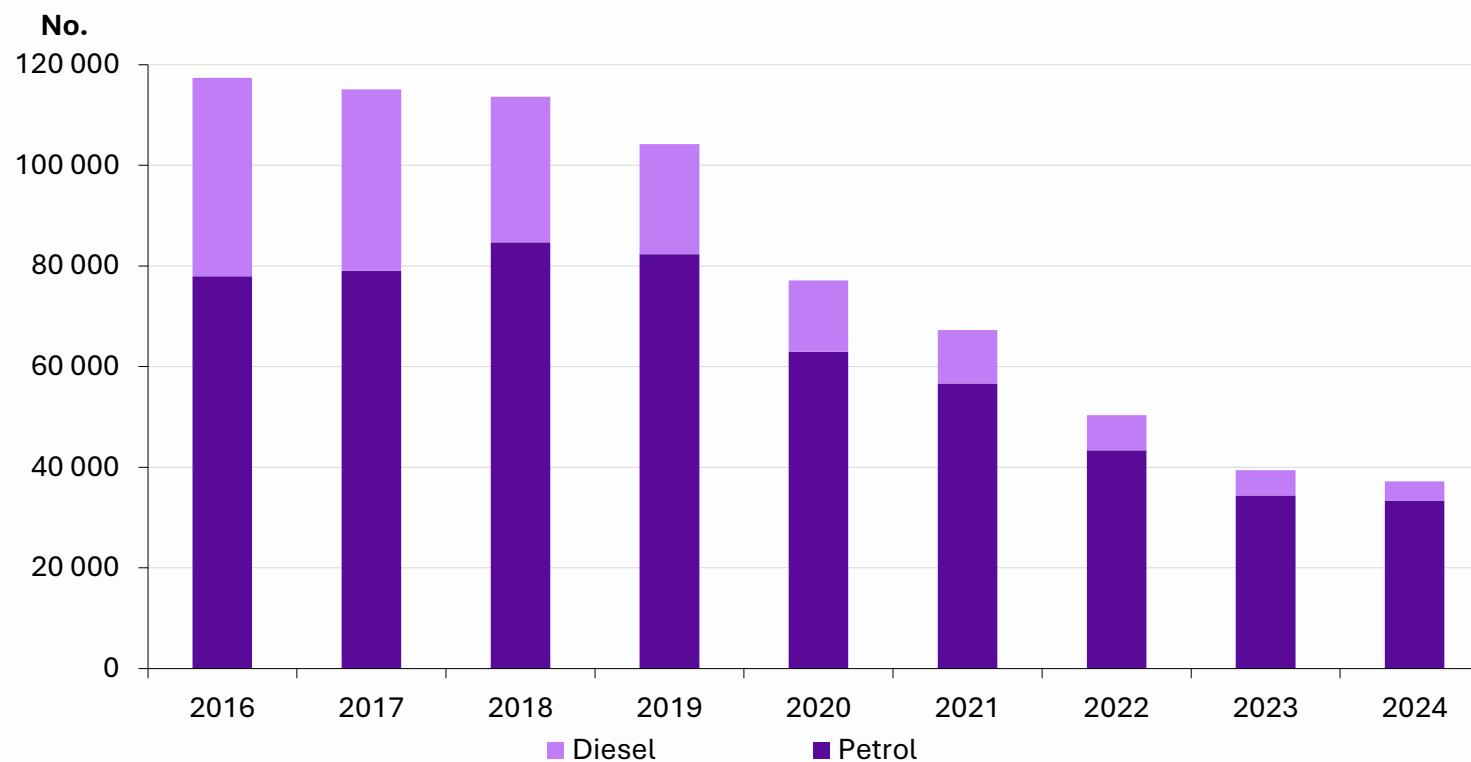
Realized wholesale electricity price and futures 7.1.2025



Data: Nord Pool, Nasdaq Commodities & EEX

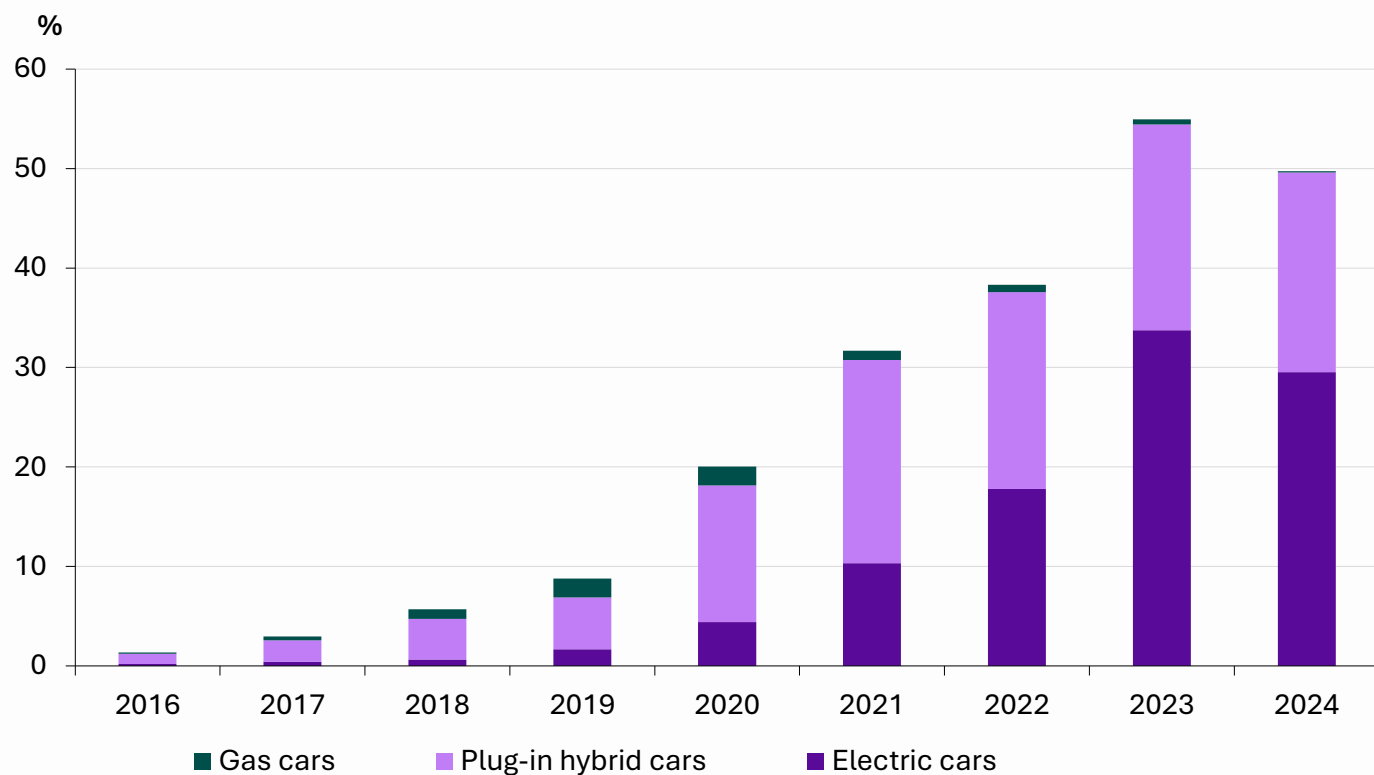
The low carbonization of traffic is progressing

Petrol and diesel car sales in Finland (new passenger cars, plug-in hybrid cars not included)



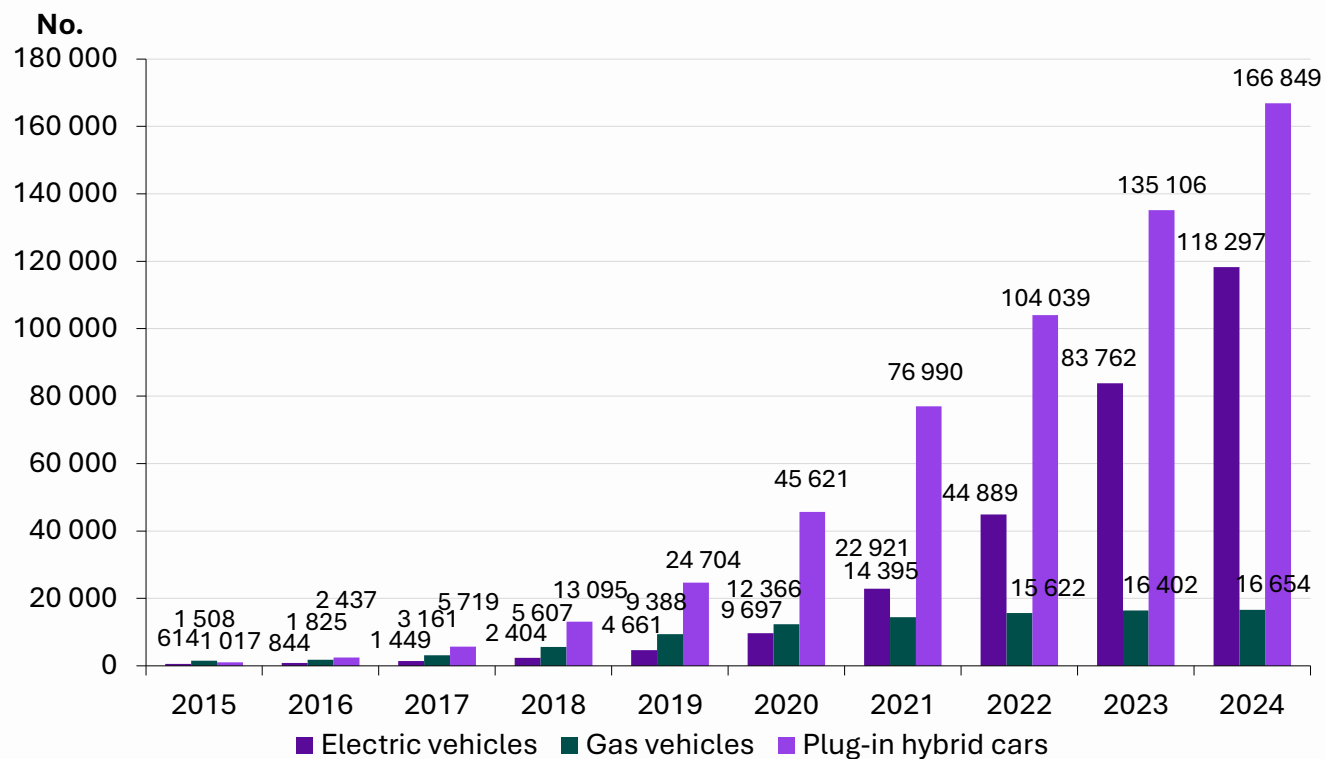
Source: Traficom

Alternative power sources for the first registration of passenger cars



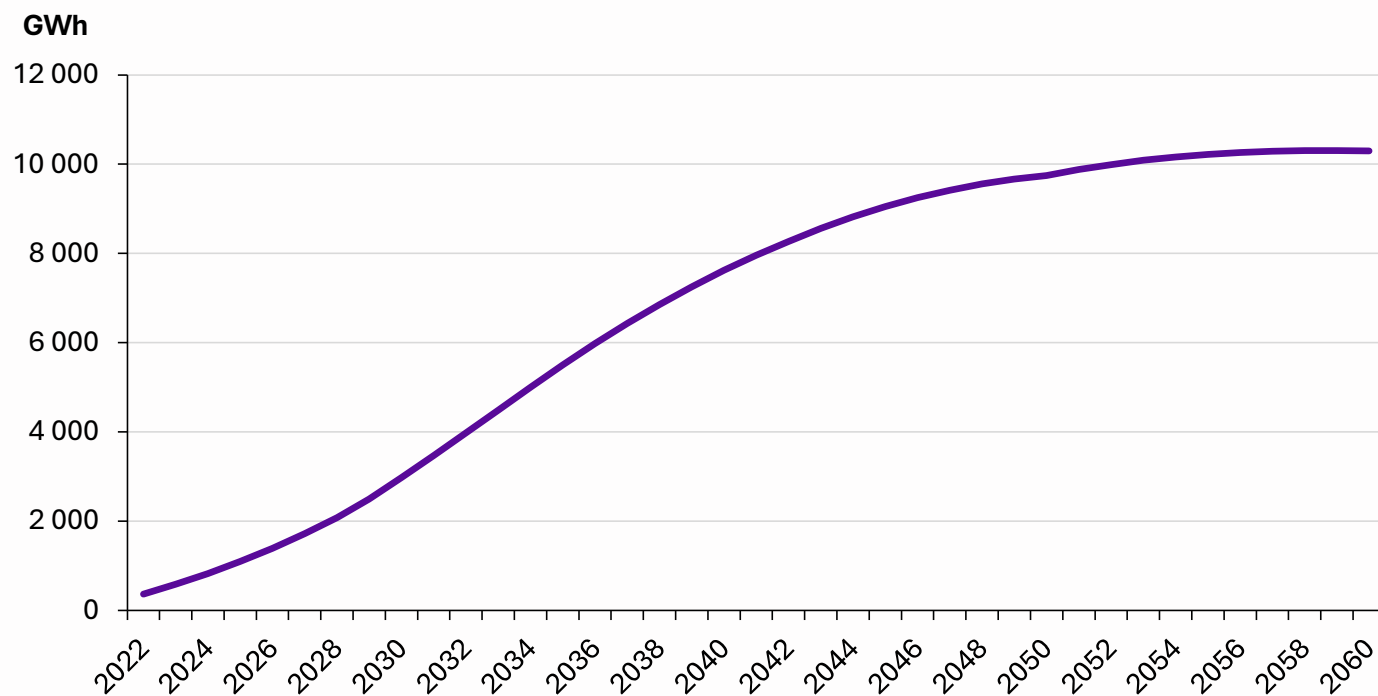
Source: Traficom

Alternative power sources in passenger cars in traffic by end of the year



Source: Traficom

Electricity consumption of passenger cars 2022-2060



Source: Scenarios for energy consumption of road transport, VTT