



Energy in Sweden 2019

An overview



An overall picture

The Swedish Energy Agency is responsible for the official energy statistics in Sweden. We gather these statistics to provide an overall picture of the energy situation and the progress in the energy area in Sweden. This means we have access to timelines of statistics starting as early as 1970.

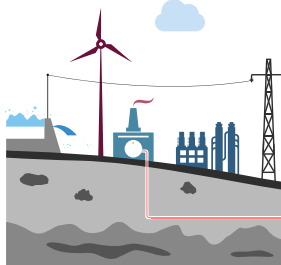
Sweden's Official Energy Statistics present a comprehensive illustration of the Swedish energy system consisting of the supply, transformation, distribution and consumption of energy.

Supplied primary energy



Biofuels, water, wind, sun, coal, crude oil, natural gas and nuclear fuel

Transformation and transmission



Electricity and heat generation and processing of feedstocks

Final energy consumption



Industrial, transport, residential and service sectors

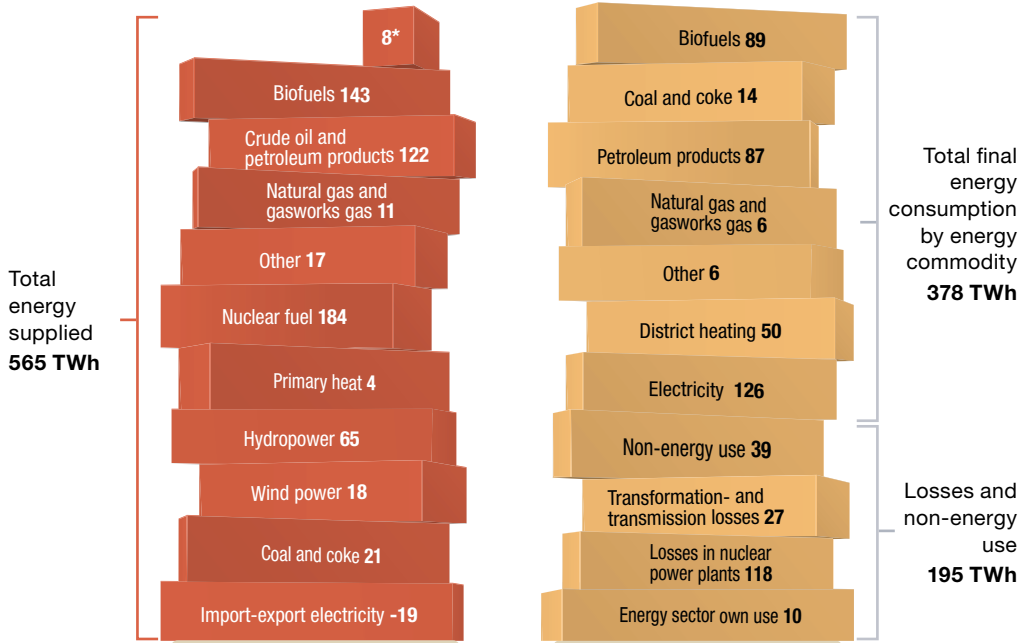
In Sweden we use domestic renewable energy sources such as water, wind, sun and biofuels. We also import nuclear fuels and fossil fuels such as oil and natural gas.

The energy system is always in balance. The energy input is always equal to the energy use, including losses.

The amount of energy supplied, within the Swedish energy system, has been about the same since the mid-1980s between 550 to 600 TWh per year.

In 2017 the total energy supply in Sweden amounted to 565 TWh.

The energy balance of Sweden in 2017:



* Statistical difference between energy supplied and energy used

Sweden's final energy use is divided into three user sectors:

The industrial sector uses mainly biofuels and electricity to run processes.



143 TWh

The residential and service sector uses mainly district heat, electricity and biofuels.



146 TWh

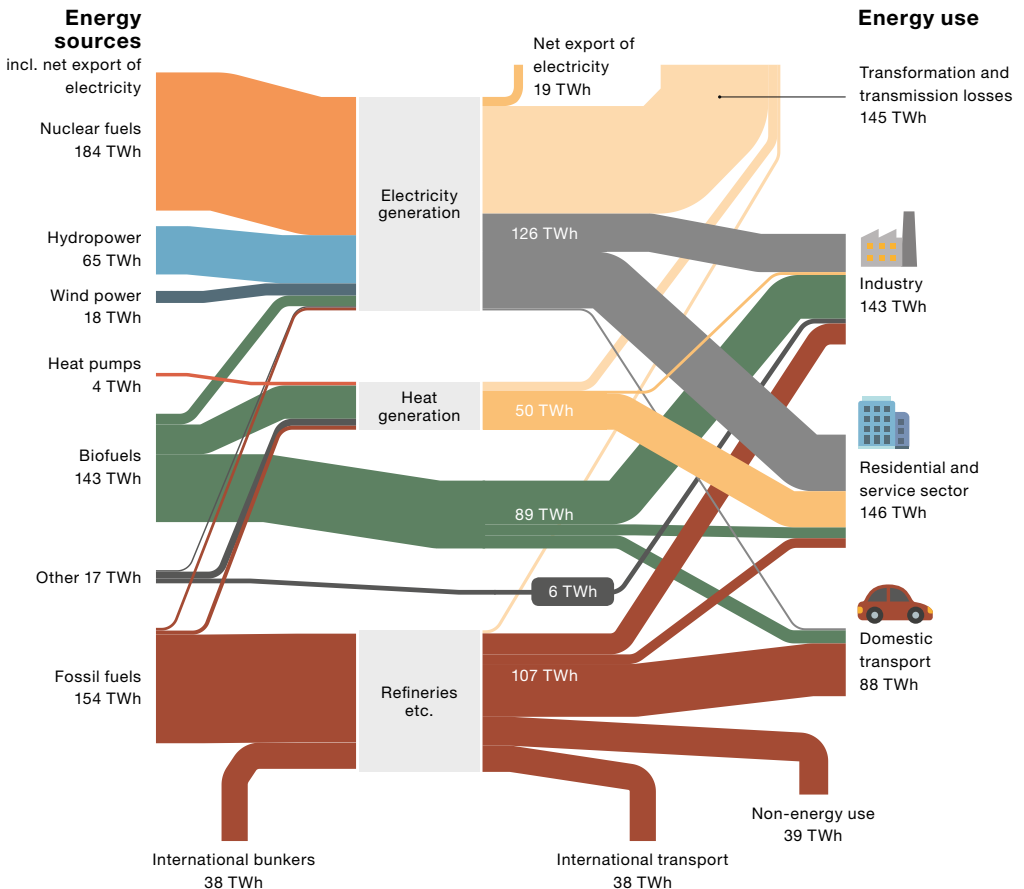
The transport sector uses mainly petroleum products such as gasoline, diesel oil and jet fuel, but also some electricity and a growing share of biofuels.



88 TWh

378 TWh

Energy system 2017



Swedish energy policies stem from the energy policies of the EU

Swedish energy policies aim to promote ecological sustainability, competitiveness and security of supply. Our energy policies are based on lawmaking within the EU. Please note that the following goals do not follow the same methods of calculation as the other statistics described in this report.



EU goals by 2020

- Reduce energy use by 20 per cent by improved energy efficiency.
- Share of renewable energy shall be at least 20 per cent of final energy use.
- Share of renewable energy in the transport sector shall be at least 10 per cent.



EU goals by 2030

- Reduce energy consumption by 32.5 per cent through increased energy efficiency.
- At least 32 per cent of energy consumption provided from renewable sources.
- 14 per cent of energy consumption by the transport sector provided from renewable sources.



Swedish energy goals

- Energy use shall be 20 per cent more efficient compared to 2008 by 2020.
- Share of renewable energy shall be at least 50 per cent of total energy use by 2020.
- Share of renewable energy in the transport sector shall be at least 10 per cent by 2020.
- 50 per cent more efficient energy consumption by 2030 compared to 2005.
- 100 per cent of electricity production shall be from renewable sources by 2040. This is not a definitive date for the restriction of nuclear power.

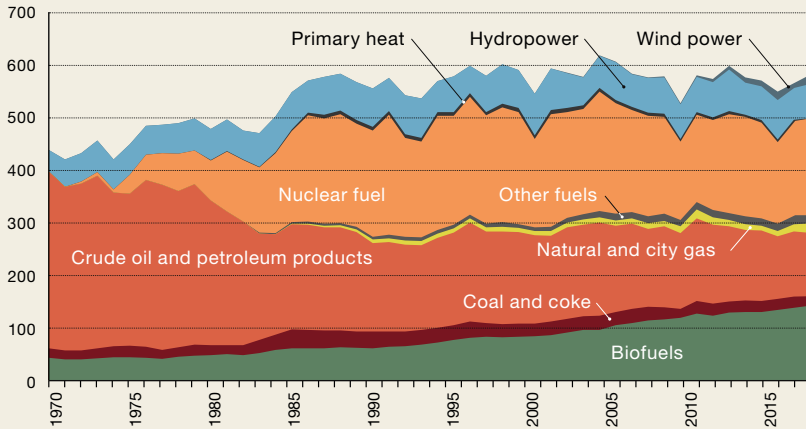
Statistics

There are plenty of instruments guiding the Swedish energy system towards the goals. Using statistics, we can see the development over time in different areas and different sectors. The development seen indicates whether Sweden is on course to reach its goals or if additional measures are needed in terms of revised instruments.

For more information about the Swedish and EU energy and climate goals, please visit our webpage: www.energimyndigheten.se/energiklimatmal



Total supplied energy 1970–2017, TWh



Sources: The Swedish Energy Agency and SCB (Statistics Sweden). Remarks:

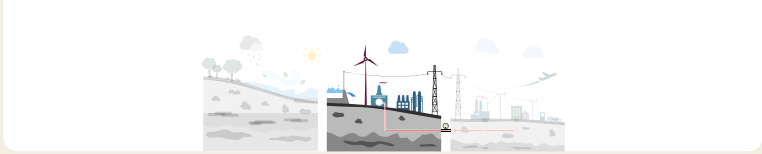
- 1) Other fuels are included in biofuels until 1983.
- 2) Domestic aviation fuel is included in crude oil and petroleum products until 1989.
- 3) Nuclear fuel is calculated according to the method used by the UN/ECE for calculating supplied energy from nuclear power.
- 4) Primary heat refers to heat pumps in district heating.
- 5) Wind power is included in hydropower until 1989.



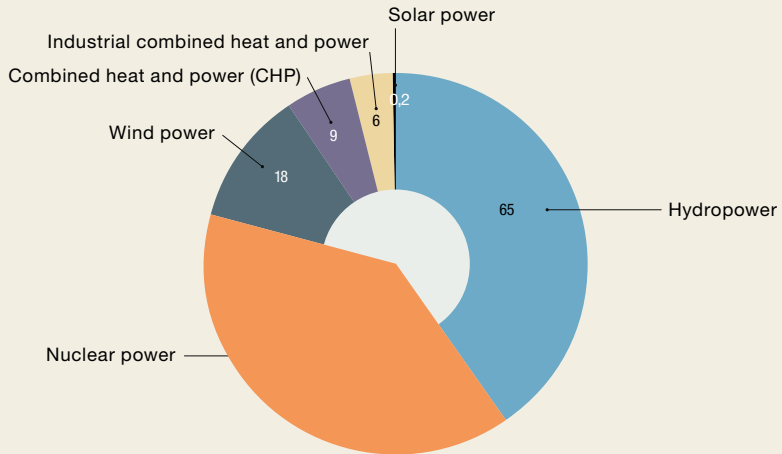
Over the last 30 years, we have seen a steadily increasing supply of biofuels.



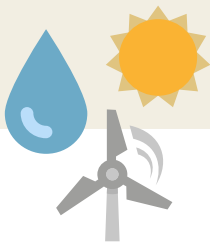
During the same time span, the supply of crude oil and petroleum products has decreased considerably. The main reason is that residential buildings and facilities are rarely heated using oil today.



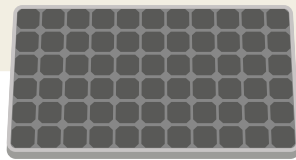
Electricity generation 2017, TWh



Sources: The Swedish Energy Agency and SCB (Statistics Sweden).
Remarks: Electricity generation for own use is not included.



In 2017, 58 per cent of Swedish electricity generation originated from renewable energy sources such as hydropower, wind power, biofuels and solar power.

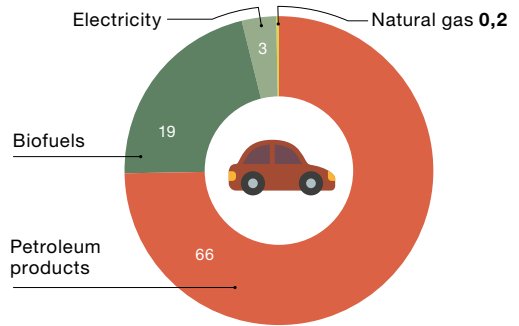


An increasing amount of solar PV cells is installed in Sweden. Between 2017 and 2018 the number of grid connected solar PV systems increased by 67 per cent. By the end of 2018, the total number of systems amounted to about 25,500, with a total installed power of 411 MW.



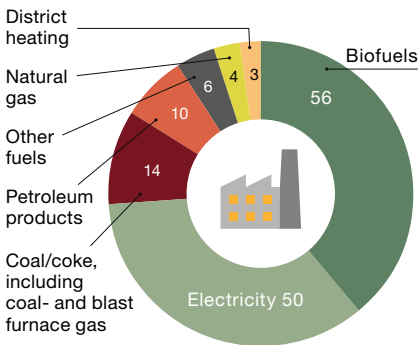
Final energy use in the transport sector, TWh, 2017

- Petroleum products, mainly gasoline and diesel, accounted for 75 per cent of the energy use in the transport sector in 2017.
- During the last few years, the amount of biofuels has increased significantly.
- Road transport accounted for 94 per cent of the final domestic transport sector energy use followed by rail transport (3 per cent), aviation (2.5 per cent) and shipping (0.4 per cent).



Source: The Swedish Energy Agency

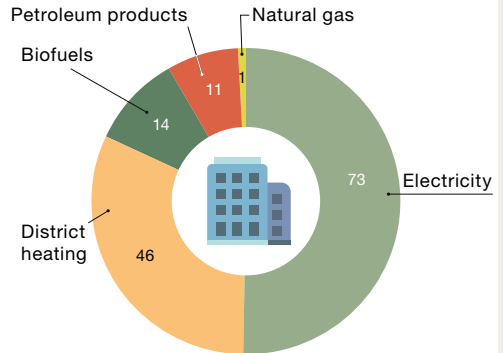
Final energy use in the industrial sector, TWh, 2017



Source: The Swedish Energy Agency

- The pulp and paper industry accounts for more than half of the final energy use within the industrial sector. Mainly biofuels and electricity are used in pulp and paper industrial processes.
- The use of fossil fuels; such as natural gas, petroleum products, coal and coke; are decreasing. However, the use is still extensive, especially within the iron- and steel industry.

Final energy use in the residential and service sector TWh, 2017

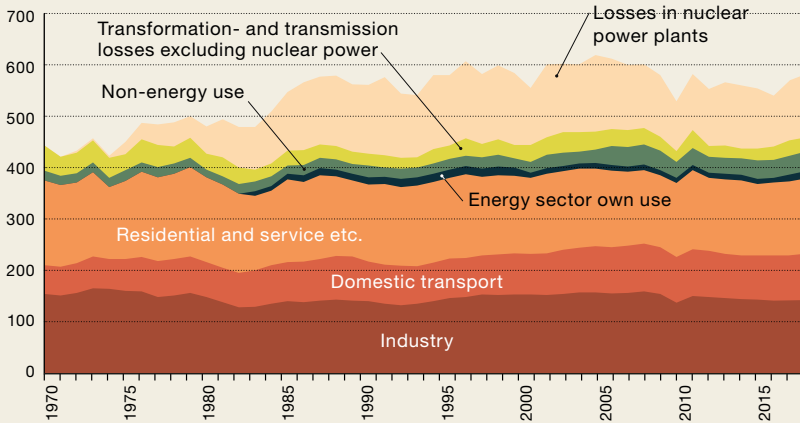


Source: The Swedish Energy Agency

- Electricity and district heating account for more than 80 per cent of the energy use in the residential and service sector.
- Electricity is the most common energy carrier for heating in houses, followed by biofuels and district heating. In multi-dwelling buildings and non-residential facilities district heating is by far the most common energy carrier
- Petroleum products are used for heating but are mainly used for machinery in agriculture, forestry, fishing and construction.

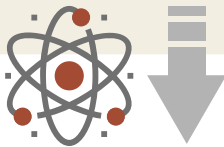


Total final energy use, 1970–2017, TWh



Sources: The Swedish Energy Agency and SCB (Statistics Sweden). Remarks:

- 1) Foreign aviation was included in final energy use until 1989.
- 2) Own use within the energy sector was included in transformation- and transmission losses until 1982.
- 3) Losses in nuclear power plants are calculated according to the method used by the UN/ECE to calculate supplied energy from nuclear power.



The biggest decline in energy use is due to smaller losses in nuclear power plants which is a consequence of decommissioned nuclear reactors.

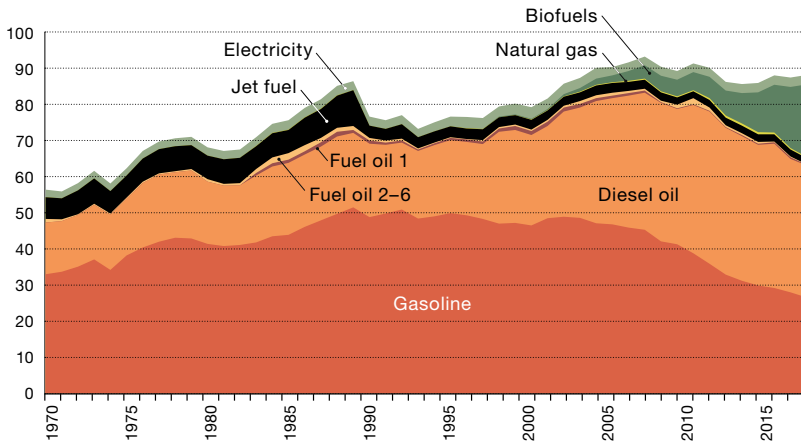


Energy consumption is affected by the weather and the economy, among other things. Since the year 2000 energy consumption has been declining.

An increasing amount of biofuel is used in the transport sector

In 2017 road transport accounted for 94 per cent of energy use in the transport sector in Sweden.

Final energy use in the transport sector, domestic, 1970–2017, TWh



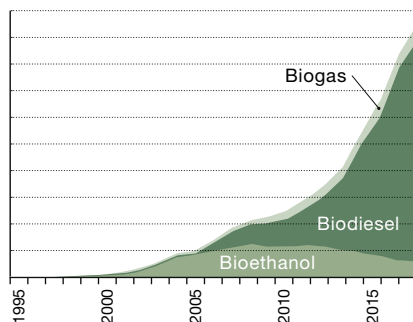
Sources: The Swedish Energy Agency, SCB (Statistics Sweden), Swedish Transport Agency.
 Remark: Until 1989 all jet fuel was included in domestic aviation, however from 1990 and onwards the jet fuel was divided into domestic- and foreign energy use.



A clear trend of the increasing use of biofuels within the transport sector can be seen, especially of biodiesel. The use of biofuels amounted to almost 19 TWh in 2017 which corresponds to 22 per cent of the transport sector's energy use.

Energy use for domestic transport was 87 TWh in 2017.

Use of biofuels in the transport sector, domestic, 1995–2017, TWh



Energy prices and energy markets

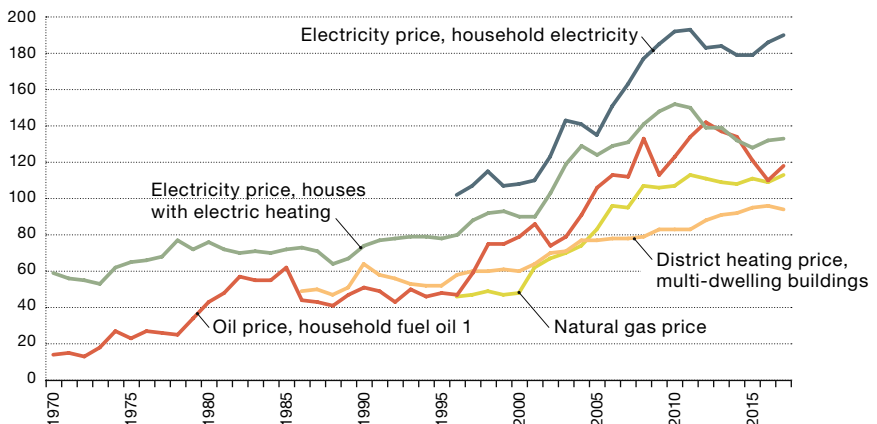
The electricity system in Sweden has historically been built on large scale, centralized production (hydropower and nuclear power) with an electricity flow from the producer to the consumer. This allows for electricity production to be adjusted.

Because of a greater use of wind and solar power, decentralized and variable production within the electricity system has increased. This imposes new demands on flexibility and balancing of the grid due to the need for a balance between production and use in the electricity system.



Energy prices for household customers were relatively stable during the second half of the 1990s and then increased significantly during the first decade of the 2000s. Increasing fuel prices and energy taxes are the main reasons for the increasing prices.

Energy prices for households and facilities 1970–2017, including taxes and VAT, in 2017 price levels, öre/kWh

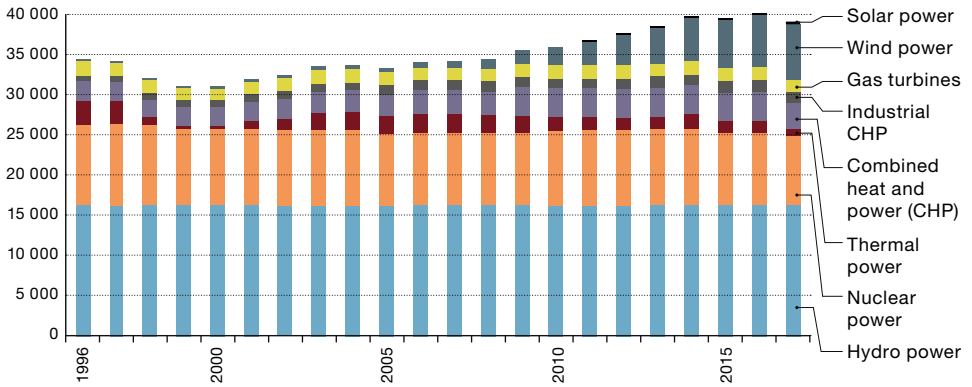


Sources: The Swedish Energy Agency, Statistics Sweden (SCB), Swedish Petroleum and Biofuels Institute (SPBI). Remark: Prices are presented in 2017 price levels; consumer price index is used for recalculating of prices.

Electricity generation and electricity use

Electricity generation in Sweden mainly comes from hydropower and nuclear power. This has been the case since the 1980s. However, the last ten years has seen a significant increase in wind power.

Installed electricity generation capacity by type of power, MW



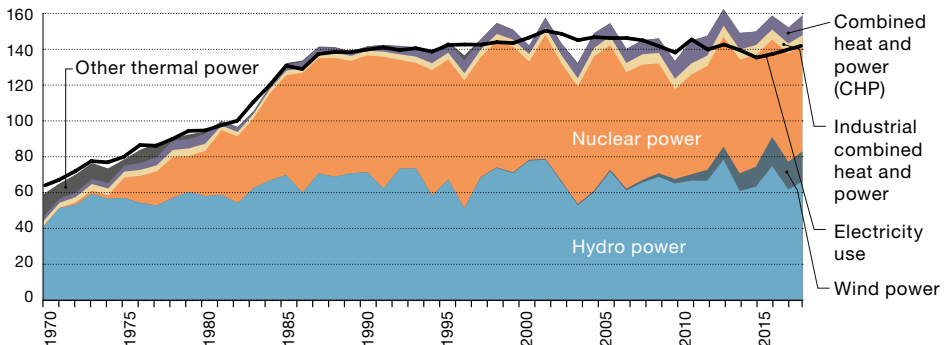
Source: Energiföretagen Sverige

In 2017 electricity generation consisted of 40 per cent hydropower, 39 per cent nuclear power and 11 per cent wind power. The remaining 9 per cent was mainly combustion-based generation, primarily in combined heat and power plants and in industrial processes.

Historically, electricity use was at its highest level in 2001, at 150 TWh. Since then electricity use has declined, reaching 142 TWh in 2017.

Most electricity is used in the residential and service sector (73 TWh), followed by the industrial sector (50 TWh) and the transport sector (2,6 TWh).

Electricity use and electricity generation per type of power 1970–2017, TWh

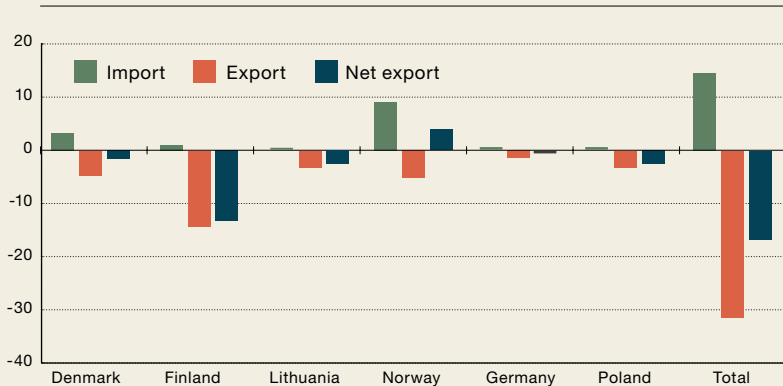


Sources: The Swedish Energy Agency and SCB (Statistics Sweden).
Remark: Electricity generation for own use is not included.

Energy around the World

In 2018 Sweden had a net export of 17,1 TWh of electricity. Most of this was exported to Finland, but also to Poland, Lithuania and Germany. Imported electricity in 2018 mainly came from Norway and Denmark.

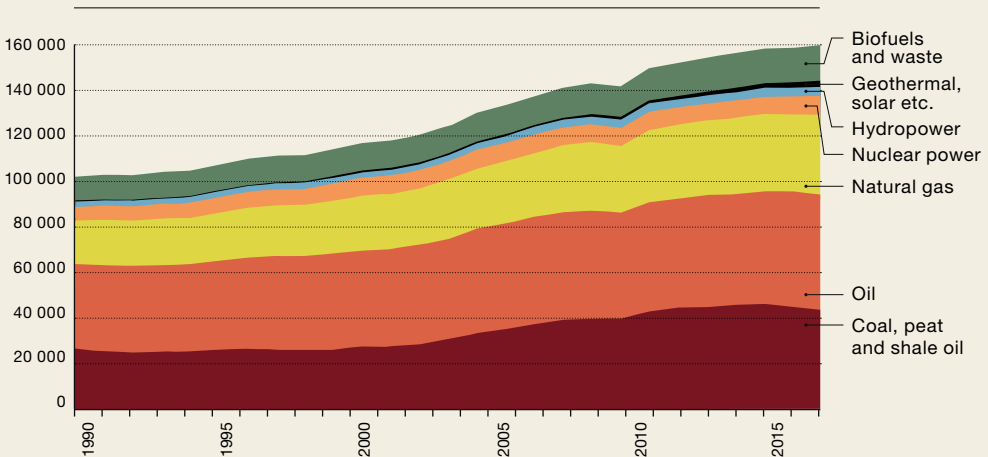
Import and export of electricity, TWh, 2018



The Global energy supply amounted to 160 000 TWh in 2016 of which 14 per cent came from renewable energy sources.

Trading between Sweden and its neighbouring countries varies from year to year as well as within years. This is a result of price differences between different electricity areas.

Global sources of energy per fuel type from 1990, TWh



Source: IEA. The Swedish Energy Agency adaptation



The Swedish Energy Agency is leading the energy transition into a modern and sustainable, fossil free welfare society - applying our credibility, a comprehensive approach and courage.

We contribute with facts, knowledge, and analysis of supply and use of energy in the society.

Research on new and renewable energy technologies, smart grids, as well as vehicles and transport fuels of the future receives funding from us. We also support business development that allows commercialisation of energy related innovations, and ensure that promising cleantech solutions can be exported.

Official energy statistics, and the management of instruments such as the Electricity Certificate System and the EU Emission Trading System, are our responsibility.

Furthermore, we participate in international collaboration with the aim of attaining Swedish energy and climate objectives, and develop and disseminate knowledge for a more efficient energy use to households, industry, and the public sector.



Swedish Energy Agency, P.O. Box 310, 631 04 Eskilstuna, Sweden
Phone +46 16-544 20 00, Fax +46 16-544 20 99
E-mail registrator@swedishenergyagency.se
www.swedishenergyagency.se