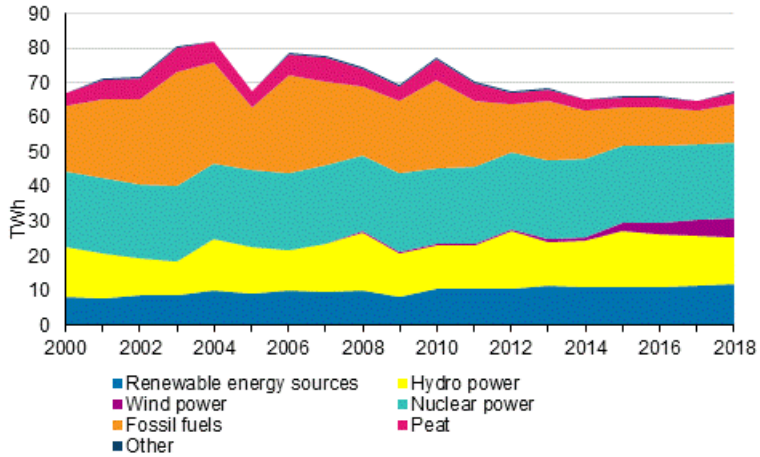
Production of electricity and heat 2018

The amount of electricity produced with fossil fuels and peat grew by 14 per cent in 2018 - The share of renewable energy sources in electricity production decreased

The production of electricity in Finland amounted to 67.5 TWh in 2018, which was 2.5 TWh more than in the year before. The amount of electricity produced with renewable energy sources and nuclear energy only increased slightly, but 1.7 TWh more electricity than in 2017 was produced with fossil fuels and peat. Now 46.2 per cent of electricity was produced with renewable energy sources while in 2017, the share was 47.2 per cent. The production of district heat increased slightly (0.5%) but the production of industrial heat grew by as much as 3.2 per cent. The use of fossil fuels in the production of district and industrial heat remained almost unchanged, but the use of peat increased by seven per cent and that of renewable energy sources by 2.1 per cent. In all, 53 per cent of district heat was produced with fossil fuels and peat, but in industrial heat the share of renewables was 75 per cent. These data derive from the statistics on the production of electricity and heat compiled by Statistics Finland.

Electricity generation by energy source 2000-2018



In 2018, the **production of electricity in Finland** amounted to 67.5 terawatt hours (TWh) or one billion kilowatt hours (kWh). Production grew by 2.5 TWh from the previous year. Correspondingly, total consumption of electricity went up by 2.0 TWh amounting to 87.5 TWh in 2018. Of total electricity consumption, 77 per cent was covered by domestic production and 23 per cent by net imports of electricity

from the Nordic countries, Russia and Estonia. Net imports of electricity contracted by 2.4 per cent from the year before. Thirty-two per cent of domestic electricity production was based on combined heat and power production.

The volume of electricity produced with renewable energy sources amounted to 31.2 TWh. Renewable energy sources accounted for 46 per cent of electricity production. Of the electricity produced with renewable energy sources 42 per cent was produced with hydro power, 19 per cent with wind power and almost all of the remainder with wood-based fuels. Thirty-two per cent of electricity was produced with nuclear power, 16 per cent with fossil fuels and five per cent with peat.

The electricity produced by hydro power amounted to 13.1 TWh, which is clearly less than in the year before. The share of hydro power in electricity production varies yearly according to the water situation. The amount of electricity produced with renewable energy sources grew slightly in 2018 despite the fact that the amount of electricity produced with hydro power decreased by ten per cent. The growth in the total amount of electricity produced with renewable energy sources was largely caused by wind power production, which grew by 22 per cent. The amount of electricity produced with wood-based fuels also increased clearly (7%).

The amount of electricity produced with fossil fuels increased by 11 per cent and that of electricity produced with peat by as much as 25 per cent from 2017. The amount of electricity produced with hard coal declined somewhat but, correspondingly, clearly more electricity than in 2017 was produced with other fossil fuels, especially with natural gas in 2018.

The upturn in manufacturing was visible as an increase in electricity (and industrial heat) production. This, together with lower availability of hydro-power, was visible as an increase in the use of fossil fuels and peat, as well as an increase in separate production of electricity that is clearly less efficient than combined production. A majority of the growth in electricity produced with fuels was caused by the increase in separate production of electricity with fossil fuels and peat (1.1 TWh). The remainder of the increase in electricity produced with fuels was divided quite evenly between combined production with fossil fuels and peat (0.7 TWh) as well as separate (0.5 TWh) and combined (0.4 TWh) production with renewable fuels. Among renewable fuels only the amount of electricity produced with black liquor (wood-based black liquor from the forest industry) increased clearly.

Electricity and heat production and fuels used by production mode in 2018

	Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, TJ[1)]
Separate production of electricity				
- Hydro power	13 137	..	..	..
- Wind power	5 839	..	..	..
- Solar power	90	..	..	..
- Nuclear power	21 881	..	..	..
- Condensing power[2)]	4 748	..	..	50 510
- Total	45 695	..	..	50 510
Combined heat and power production	21 836	24 709	43 539	402 261
Separate heat production	..	13 800	11 665	92 033
Total production	**67 532**	**38 509**	**55 204**	**544 804**
Net imports of electricity	19 936	..	..	..
Total	**87 467**	**38 509**	**55 204**	**544 804**

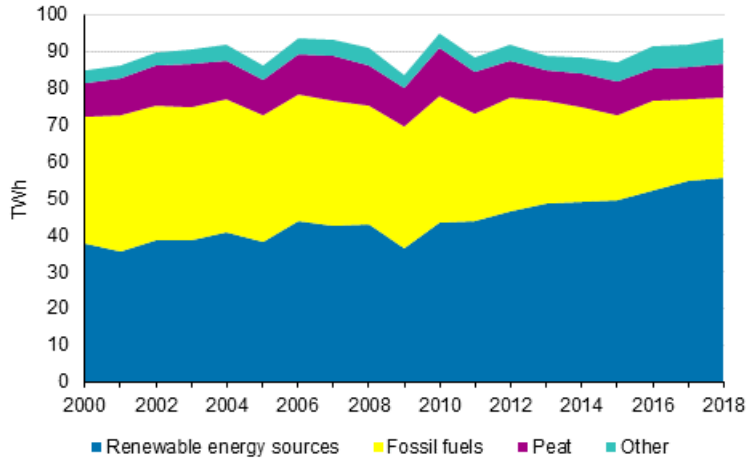
1) In calculating total primary energy used, hydro power, wind power, solar power and net imports of electricity are made commensurate with fuels according to directly obtained electricity (3.6 PJ/TWh). Total nuclear energy used is calculated at the efficiency ratio of 33 per cent from produced nuclear power (10.91 PJ/TWh).

2) Condensing power includes condensing power plants, shares of condensing electricity of combined heat and power production plants, and peak gas turbines and similar separate electricity production plants.

The **production of district heat** totalled 38.5 TWh in 2018, being 0.5 per cent higher than in the previous year. The use of renewable and fossil fuels in the production of district heat remained unchanged, but the use of peat increased by seven per cent from the year before. Clearly under one-half of district heat was produced with fossil fuels. Most of district heat was produced with wood fuels (33%) and hard coal (20 %). Peat retained its position as the third most important energy source in district heat production; 15 per cent of district heat was produced with peat. The amount of district heat produced with flue gas scrubbers and other waste heat (includes heat pumps) has grown considerably in recent years. They produced nine per cent of district heat in 2018.

The **production of industrial heat** was 55.2 TWh in 2018. Production went up 3.2 per cent from the year before. One-half of heat produced for the needs of manufacturing comes from black liquor. In all, 75 per cent of the production of industrial heat was based on renewable fuels. One of the biggest users of industrial heat is the forest industry, which uses its own fuels in production, like black liquor and other wood fuels. In the chemical and metal industries, part of the use of heat is considered as direct fuel use, and is thus not visible in the production figures on heat.

District heat and industrial heat production by fuels 2000-2018



The statistics on the production of electricity and heat cover the entire production of electricity connected to the grid. The coverage of the statistics has been improved by adding district heat production plants. Therefore, the figures are not fully comparable with the statistics for previous years. Solar power and small CHP produced with biogas are also included in the statistics. From 2015 onwards, the statistics also cover small heat plants, that is, all production of district heat. The statistics do not cover all industrial heat and producers of so-called local heating.

Links:

Statistics Finland's inquiry on production of electricity and heat

Finnish Energy Industries, electricity production statistics
https://energia.fi/en/news_and_publications/statistics

Contents

Tables

Appendix tables

Figures

Appendix figures

Appendix tables

Appendix table 1. Electricity and heat production by production mode and fuel in 2018

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Condensing power production[1)]	Oil	83	-	-	298	1 073
	Hard coal	1 540	-	-	4 164	14 991
	Natural gas	110	-	-	288	1 036
	Other fossil[2)3)]	637	-	-	1 790	6 445
	Peat	791	-	-	2 310	8 317
	Black liquor	666	-	-	2 344	8 439
	Other wood fuels	757	-	-	2 243	8 075
	Other renewables[2)4)]	113	-	-	356	1 281
	Other energy sources[5)]	50	-	-	237	854
	Total	**4 748**	**-**	**-**	**14 031**	**50 510**
Combined heat and power production[6)]	Oil	146	129	446	894	3 218
	Hard coal	3 902	7 116	570	13 330	47 988
	Natural gas	3 977	3 268	2 232	10 850	39 059
	Other fossil[2)3)]	481	1 139	542	2 842	10 231
	Peat	2 459	4 443	2 764	11 803	42 491
	Black liquor	5 771	209	27 488	43 321	155 956
	Other wood fuels	4 129	6 979	7 738	23 193	83 495
	Other renewables[2)4)]	682	1 319	670	3 469	12 487
	Other energy sources[5)]	290	107	1 090	2 038	7 336
	Total	**21 836**	**24 709**	**43 539**	**111 739**	**402 261**
Separate production of heat[7)]	Oil	-	701	1 328	2 854	10 273
	Hard coal	-	593	180	878	3 160
	Natural gas	-	1 676	1 621	3 641	13 107
	Other fossil[2)3)]	-	204	230	503	1 812
	Peat	-	1 249	747	2 348	8 454
	Black liquor	-	12	579	733	2 638
	Other wood fuels	-	5 336	4 448	11 510	41 435
	Other renewables[2)4)]	-	293	403	824	2 965
	Other energy sources[5)]	-	3 736	2 130	2 275	8 190
	of which flue gas scrubber	-	2 330	591	..	..
	Total	**..**	**13 800**	**11 665**	**25 565**	**92 033**
Total	Oil	229	830	1 774	4 046	14 564
	Hard coal	5 442	7 710	750	18 372	66 138
	Natural gas	4 087	4 944	3 853	14 778	53 201
	Other fossil[2)3)]	1 118	1 344	772	5 135	18 487
	Peat	3 250	5 691	3 511	16 462	59 262
	Black liquor	6 437	221	28 067	46 398	167 032
	Other wood fuels	4 887	12 315	12 186	36 946	133 006
	Other renewables[2)4)]	795	1 612	1 072	4 648	16 733
	Other energy sources[5)]	340	3 843	3 220	4 550	16 380
	Total	**26 585**	**38 509**	**55 204**	**151 334**	**544 804**

1) Condensate parts produced in connection with combined heat and power production were calculated with condensing power.

2) Mixed fuels (such as recycled fuel) are divided into renewable and fossil fuels in ratio to the fossil and biodegradable coal contained in them.

3) Other fossil fuels include blast furnace gas and coke oven gas and coke, and plastics fuels and other waste fuels and the fossil part of mixed fuels.

4) Other renewable fuels comprise the bio part of mixed fuels and biogas.

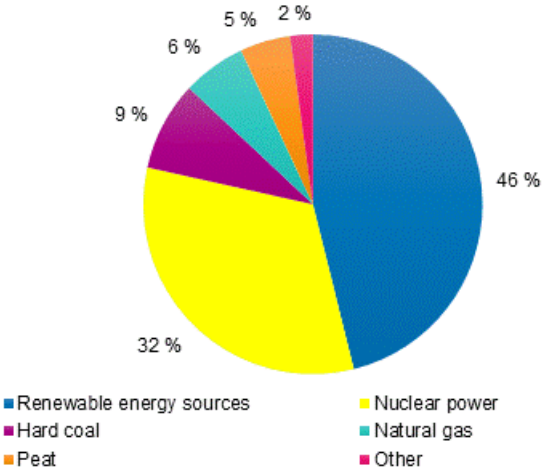
5) Other energy sources include hydrogen, electricity, and reaction and secondary heat of industry.

6) Combined heat and power production includes pure combined production.

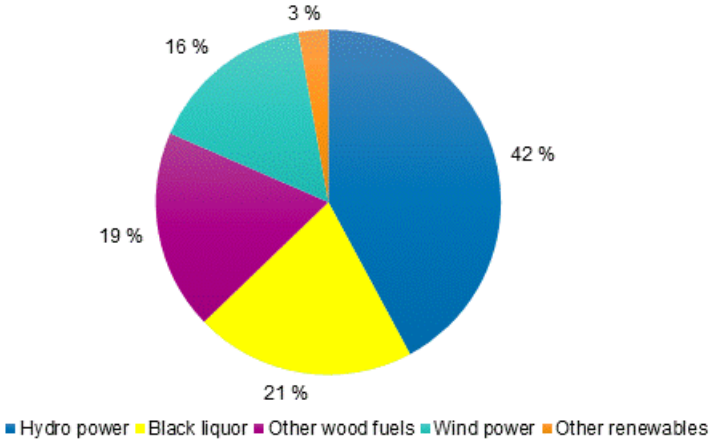
7) Reduction heat produced in connection with condensate production and combined heat and power production were calculated in separate production of heat.

Appendix figures

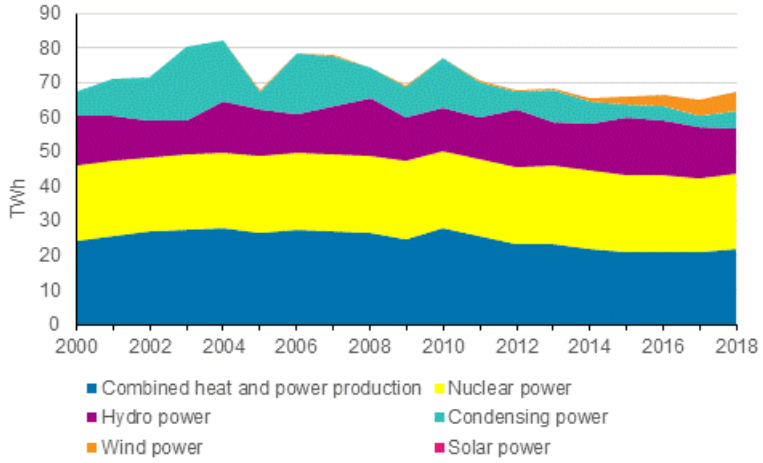
Appendix figure 1. Electricity generation by energy source 2018



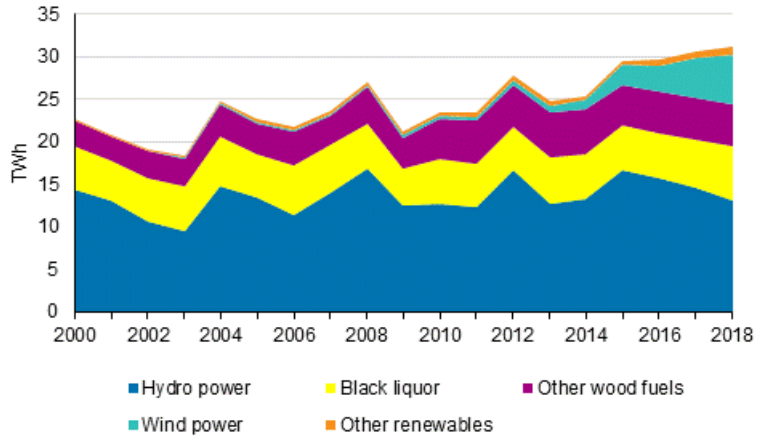
Appendix figure 2. Electricity generation with renewables 2018



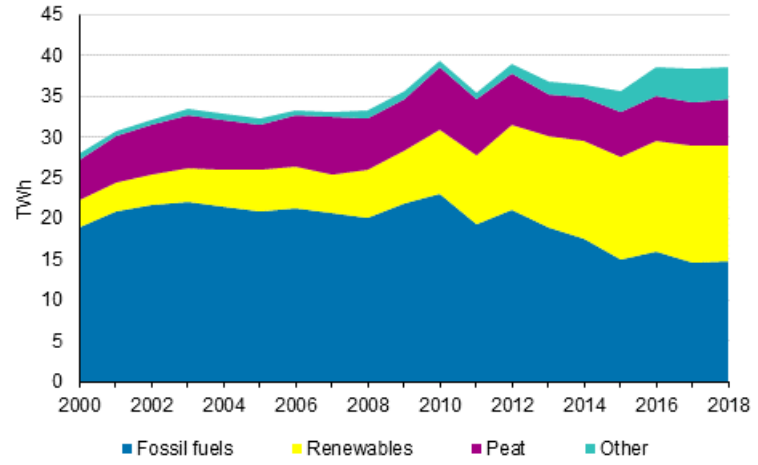
Appendix figure 3. Electricity generation by production mode 2000-2018



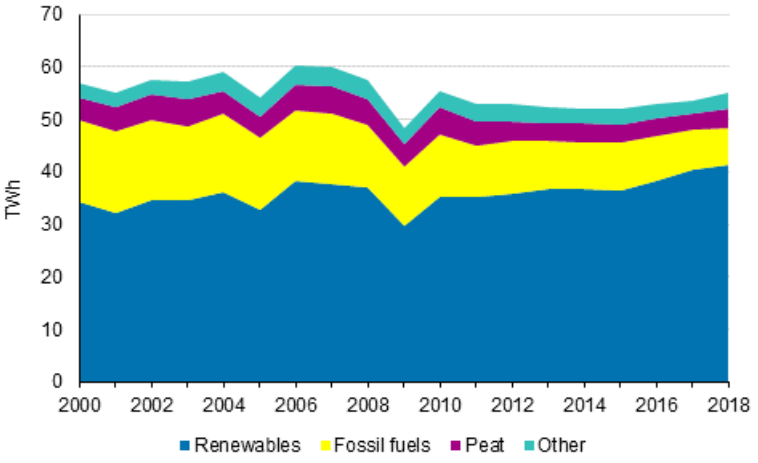
Appendix figure 4. Electricity generation with renewables 2000-2018



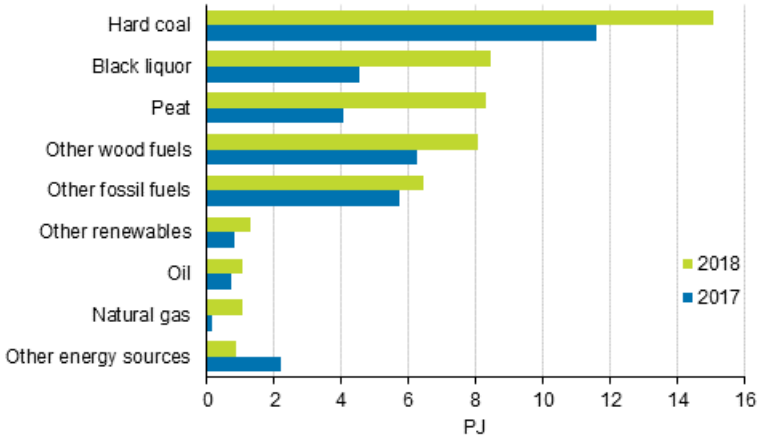
Appendix figure 5. District heat production by fuels 2000-2018



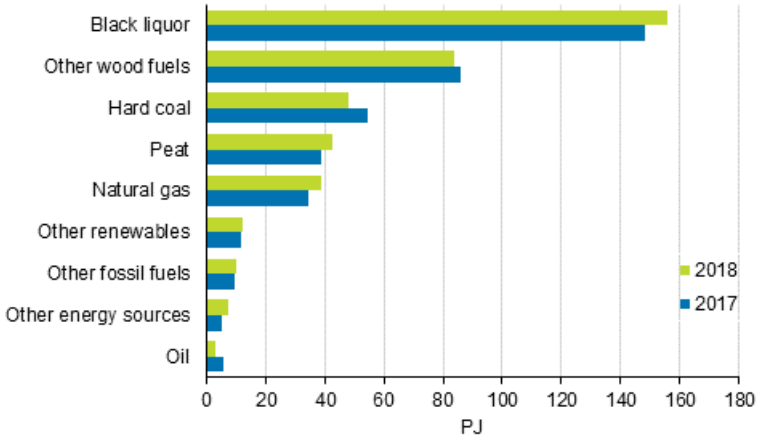
Appendix figure 6. Industrial heat production by fuels 2000-2018



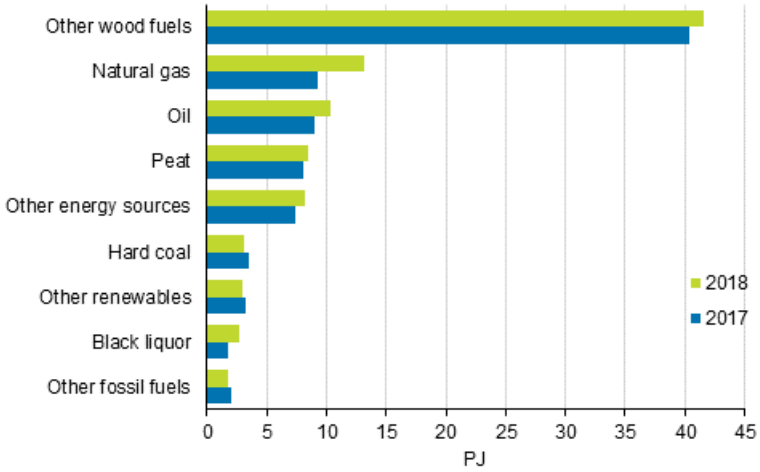
Appendix figure 7. Fuel use in separate electricity production 2017-2018



Appendix figure 8. Fuel use in combined heat and power production 2017-2018



Appendix figure 9. Fuel use in separate heat production 2017-2018



Statistics Finland

Suomen virallinen tilasto
Finlands officiella statistik
Official Statistics of Finland

Energy 2019

Inquiries

Pekka Lösönen 029 551 3268
Minna Niininen 029 551 3549
Director in charge:
Ville Vertanen

energia@stat.fi
www.stat.fi

Source: Statistics on production of electricity and heat, Statistics Finland and Electricity statistics, Finnish Energy Industries

Communication and Information Services, Statistics Finland
tel. +358 29 551 2220
www.stat.fi

Publication orders, Edita Publishing Oy
tel. +358 20 450 05
www.editapublishing.fi

ISSN 1796-0479
= Official Statistics of Finland
ISSN 1798-5099 (pdf)