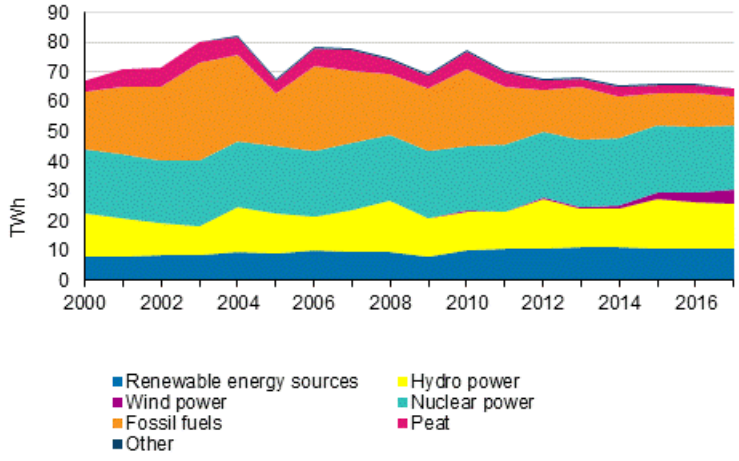
Production of electricity and heat 2017

Use of renewable energy sources grew in electricity and heat production in 2017

The production of electricity in Finland amounted to 67.7 TWh in 2017, which was slightly less than in the year before. The amount of electricity produced with renewable energy sources grew by 1.1 TWh to the value of 30.7 TWh, which is 45 per cent of total electricity production. The production of district heat remained on level with the previous year, but the production of industrial heat grew by 0.8 per cent. The use of renewable energy sources grew clearly in the production of district and industrial heat. The use of fossil fuels decreased in the production of electricity and district heat by 12 per cent. The use of peat fell by around five per cent. These data derive from the statistics on the production of electricity and heat compiled by Statistics Finland.

Electricity generation by energy source 2000-2017



In 2017, the production of electricity in Finland amounted to 65.0 terawatt hours (TWh) or one billion kilowatt hours (kWh). The production decreased slightly from the year before. However, total electricity consumption remained on level with the previous year, at 85.5 TWh. Of total electricity consumption, 76 per cent was covered by domestic production and 24 per cent by net imports of electricity from the Nordic countries, Russia and Estonia. Net imports of electricity grew by 7.8 per cent from the year before. Thirty-two per cent of domestic electricity production was based on combined heat and power production.

The electricity produced by hydro power amounted to 14.6 TWh, which is slightly less than in the year before. The share of hydro power in electricity production varies yearly according to the water situation. The volume of electricity produced with renewable energy sources amounted to 39.7 TWh. Renewable energy sources accounted for 47 per cent of electricity production. Nearly one-half of the electricity produced with renewable energy sources was produced with hydro power, 16 per cent with wind power and almost all of the remainder with wood-based fuels. Fifteen per cent of electricity was produced with fossil fuels, four per cent with peat and 33 per cent with nuclear power.

The amount of electricity produced with renewable energy sources grew in 2017 despite the fact that the amount of electricity produced with hydro power decreased by nearly seven 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 as much as 56 per cent. The amount of electricity produced with wood-based fuels grew by 3.5 per cent. The amount of electricity produced with fossil fuels declined by 13 per cent from the year before, as the amount produced with hard coal decreased by 16 per cent and that produced with natural gas by 12 per cent. The use of fossil fuels varies yearly particularly according to the use of hard coal. Over the past few years, their use has in total decreased and the use of renewable fuels has correspondingly increased. The amount of electricity produced with peat decreased by five per cent from the year before.

Electricity and heat production and fuels used by production mode in 2017

	Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, TJ[1)]
Separate production of electricity				
- Hydro power	14 610	..	..	..
- Wind power	4 795	..	..	..
- Solar power	44	..	..	..
- Nuclear power	21 574	..	..	..
- Condensing power[2)]	3 284	..	..	36013
- Total	44 307	..	..	36 013
Combined heat and power production	20 735	24 659	43 821	394 653
Separate heat production	..	13 632	9 834	84 518
Total production	**65 042**	**38 292**	**53 655**	**515 184**
Net imports of electricity	20 426	..	..	..
Total	**85 468**	**38 292**	**53 655**	**515 184**

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).

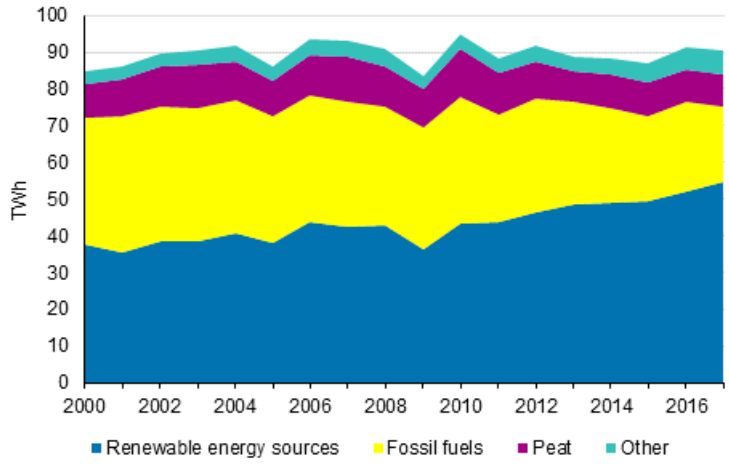
2) Condensing power includes condensing power plants, shares of condensing electricity of combined heat and power production plants, and peak gas turbines and similar separate electricity production plants.

The production of district heat totalled 38.3 TWh in 2017, being thus on level with the previous year. The use of renewable fuels in the production of district heat grew by six per cent from the year before. In turn, the use of fossil fuels diminished by eight per cent. 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 (23%). Peat retained its position as the third most important energy source in district heat production; 14 per cent of district heat was produced with peat. Heat recovery of flue gas scrubbers has grown considerably in recent years. They produced six per cent of district heat in 2017.

The production of industrial heat was 53.7 TWh in 2017. The production went up slightly 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 2000-2017



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 electricity and heat production inquiry

Finnish Energy Industries
https://energia.fi/en/news_and_publications/statistics/electricity_statistics

Statistics Finland's electricity and heat production inquiry

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Appendix table 1. Electricity and heat production by production mode and fuel in 2017

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Condensing power production[1)]	Oil	50	..	..	201	725
	Hard coal	1 195	..	..	3 215	11 574
	Natural gas	11	..	..	41	148
	Other fossil[2)3)]	459	..	..	1 596	5 747
	Peat	377	..	..	1 124	4 046
	Black liquor and other concentrated liquors	377	..	..	1 253	4 512
	Other wood fuels	600	..	..	1 737	6 254
	Other renewables[2)4)]	75	..	..	226	812
	Other energy sources[5)]	141	..	..	609	2 193
	Total	**3 284**	**..**	**..**	**10 004**	**36 013**
Combined heat and power production[6)]	Oil	108	99	1 208	1 608	5 789
	Hard coal	4 336	8 055	603	15 090	54 325
	Natural gas	3 210	2 444	2 713	9 511	34 240
	Other fossil[2)3)]	435	1 178	452	2 661	9 580
	Peat	2 225	4 146	2 631	10 850	39 060
	Black liquor and other concentrated liquors	5 296	164	26 657	41 258	148 529
	Other wood fuels	4 262	7 152	8 192	23 903	86 050
	Other renewables[2)4)]	634	1 273	660	3 264	11 752
	Other energy sources[5)]	227	149	705	1 480	5 328
	Total	**20 735**	**24 659**	**43 821**	**109 626**	**394 653**
Separate production of heat[7)]	Oil	..	827	971	2 489	8 961
	Hard coal	..	587	270	981	3 531
	Natural gas	..	1 250	1 089	2 580	9 286
	Other fossil[2)3)]	..	203	265	563	2 028
	Peat	..	1 236	651	2 252	8 107
	Black liquor and other concentrated liquors	..	12	393	478	1 720
	Other wood fuels	..	5 338	4 198	11 210	40 357
	Other renewables[2)4)]	..	349	395	896	3 224
	Other energy sources[5)]	..	3 830	1 602	2 029	7 304
	of which flue gas scrubber		*2 397*	*262*		
	Total	**..**	**13 632**	**9 834**	**23 477**	**84 518**

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Total	Oil	158	926	2 179	4 299	15 475
	Hard coal	5 531	8 642	873	19 286	69 431
	Natural gas	3 220	3 693	3 802	12 132	43 675
	Other fossil[2)3)]	893	1 378	713	4 810	17 315
	Peat	2 602	5 382	3 282	14 226	51 213
	Black liquor and other concentrated liquors	5 673	176	27 050	42 989	154 761
	Other wood fuels	4 863	12 491	12 390	36 850	132 662
	Other renewables[2)4)]	710	1 624	1 059	4 396	15 827
	Other energy sources[5)]	369	3 979	2 307	4 118	14 825
	Total	**24 019**	**38 292**	**53 655**	**143 107**	**515 184**

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.

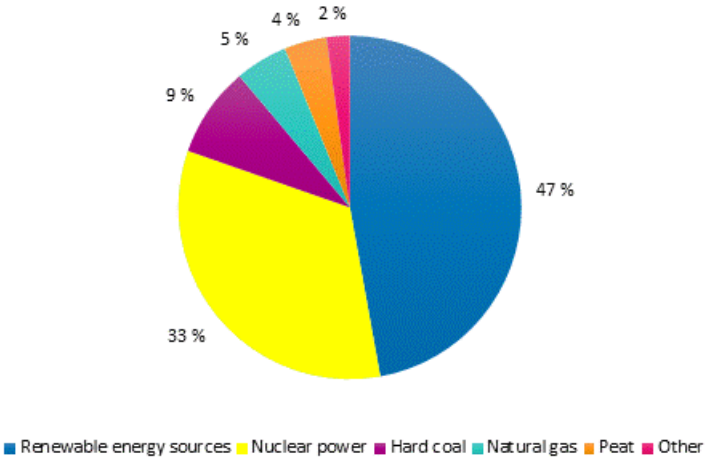
5) Other energy sources include hydrogen, electricity, and reaction and secondary heat of industry.

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

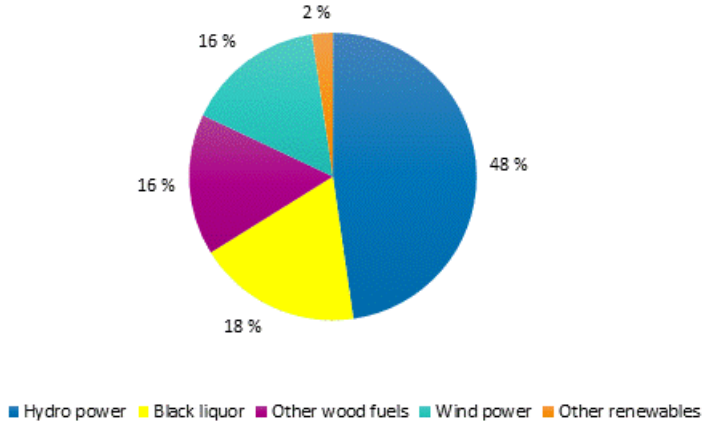
7) Reduction heat produced in connection with condensate production and combined heat and power production were calculated in separate production of heat.

Appendix figures

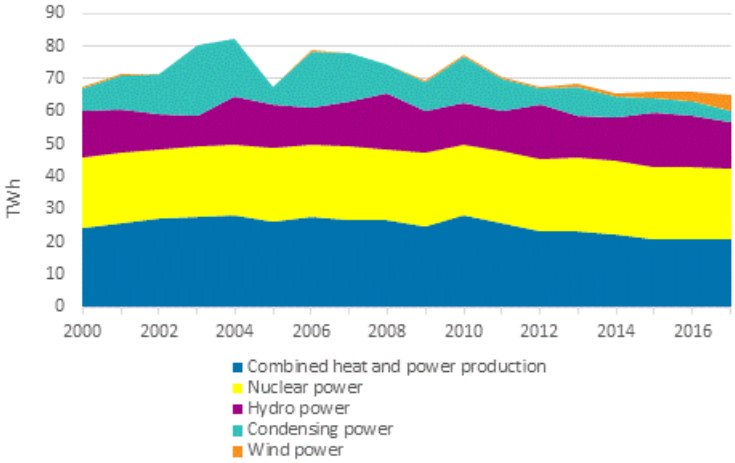
Appendix figure 1. Electricity generation by energy source 2017



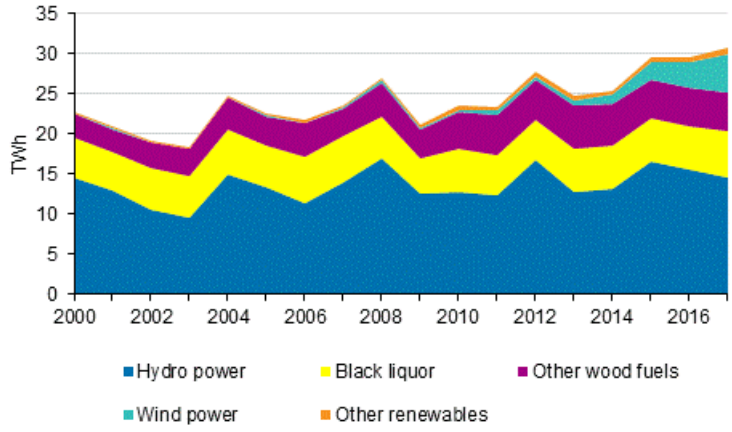
Appendix figure 2. Electricity generation with renewables 2017



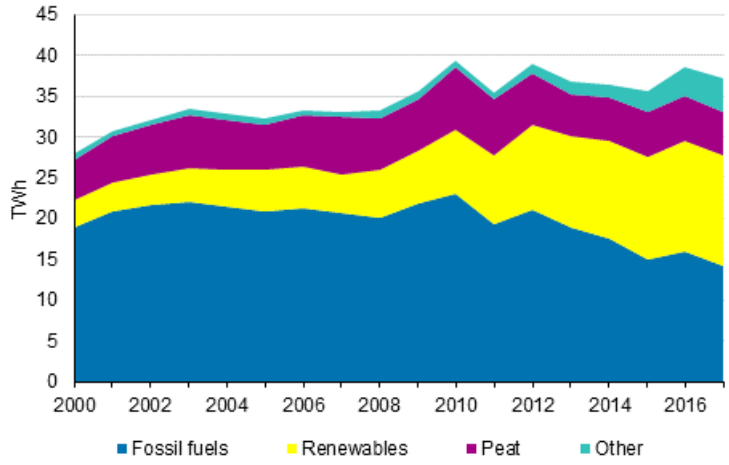
Appendix figure 3. Electricity generation by production mode 2000-2017



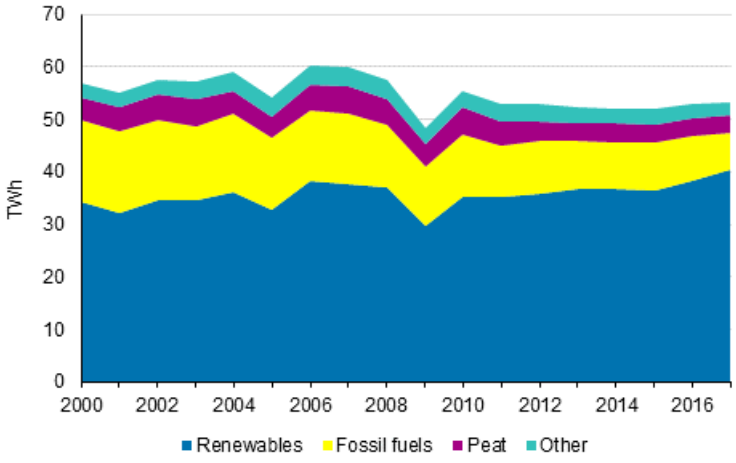
Appendix figure 4. Electricity generation with renewables 2000-2017



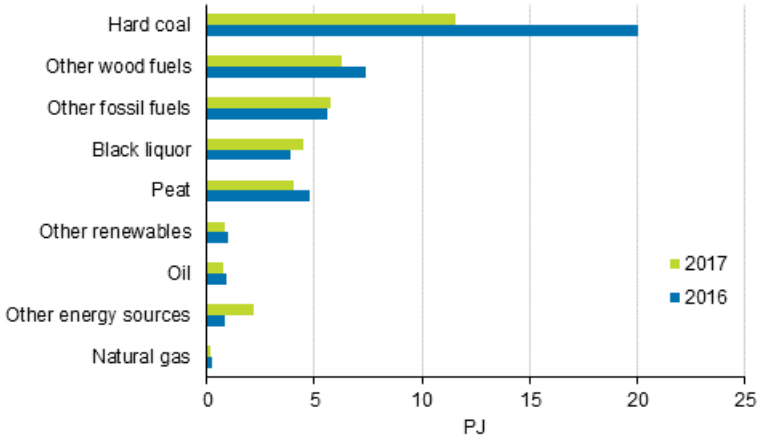
Appendix figure 5. District heat production by fuels 2000-2017



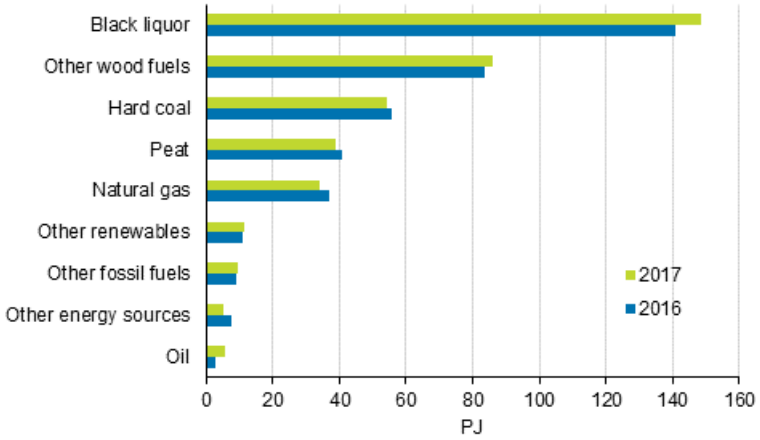
Appendix figure 6. Industrial heat production by fuels 2000-2017



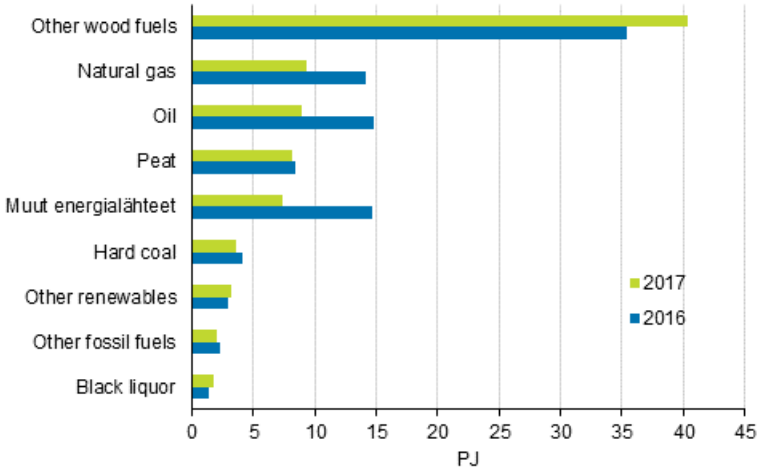
Appendix figure 7. Fuel use in separate electricity production 2016-2017



Appendix figure 8. Fuel use in combined heat and power production 2016-2017



Appendix figure 9. Fuel use in separate heat production 2016-2017



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Inquiries

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

energia@stat.fi
www.stat.fi

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