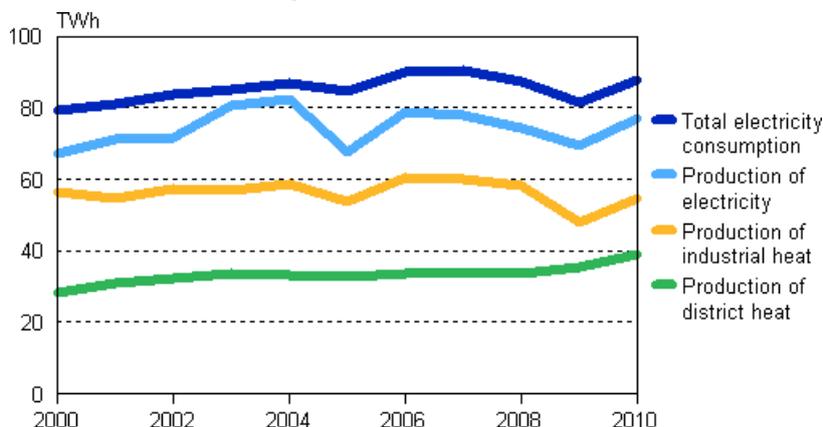


Production of electricity and heat 2010

Production of electricity and heat grew in 2010

According to Statistics Finland's statistics on production of electricity and heat, domestic production of electricity grew by 12 per cent, production of district heat by nine per cent and that of industrial heat by 14 per cent in 2010. The eight per cent growth in total consumption of electricity from the previous year raised domestic production of electricity. In addition, more electricity was produced for the Nordic electricity markets than one year before. The production of electricity grew particularly in separate production of condensing power, by 58 per cent.

Production of electricity, district heat and industrial heat in 2000–2010



Total electricity consumption rose by eight per cent from the previous year, being 87.7 terawatt hours (TWh), or one billion kilowatt hours (kWh). Of this consumption, 88 per cent was covered by domestic production and the remaining 12 per cent by net imports of electricity. Electricity is imported to Finland from the Nordic countries, Russia and Estonia. Electricity is also exported from Finland to other Nordic countries and Estonia. The volume of imported electricity remained on level with the previous year, but exports of electricity grew to the Nordic countries, where, as in the previous year, the water reserves were at a lower level than average.

In Finland and other Nordic countries, the demand for electricity rose as the economy started to grow again after the downturn. According to Statistics Finland's data on the volume index of industrial output, industrial output in Finland grew by six per cent in 2010. The cold winter and autumn also increased consumption of electricity.

In 2010, the volume of **electricity produced** in Finland amounted to 77.2 TWh. The production grew by 12 per cent. The production grew most for condensing power, up by 58 per cent. Of condensing power, 66 per cent was produced with coal (includes hard coal, coke, and blast furnace and coke oven gas). Electricity produced with combined heat and power production rose, by 13 per cent, thus reaching a new record, 28.1 TWh. The growth in combined heat and power production was due to the recovery of the forest industry and the introduction of new power plants.

The use of coal, wood and peat in electricity production increased. The production of hydro power grew by one per cent and that of nuclear power contracted by three per cent. The production of wind power went up by six per cent.

The use of coal, wood and peat in electricity production increased. The production of hydro power grew by one per cent and that of nuclear power contracted by three per cent. The production of wind power went up by six per cent.

The production of district heat grew by nine per cent from the previous year, to 39.0 TWh. The cold winter and autumn increased the need for heating, in addition to which the number of district heat customers continued to grow.

Nearly 60 per cent of district heat was produced from fossil fuels. One half of this was produced with natural gas. The volumes of district heat produced with peat and renewable fuels were almost equal, 19 per cent. The production of district heat grew particularly for natural gas, peat and wood fuels.

The **production of industrial heat** grew by 14 per cent, being 54.8 TWh. The recovery of industrial output increased the need for heat for the industry's own use, but also industrial enterprises' own energy production.

Over 60 per cent of the heat used by the industry was produced with renewable fuels. The majority of renewable fuels was covered by black liquor from the forest industry and the rest by other wood fuels. The use of recycled fuels was low in the production of industrial heat. Twenty-one per cent of heat was produced with fossil fuels. The biggest fossil fuel in the production of industrial heat was natural gas, 14 per cent. The production of industrial heat with wood fuels and peat went up. Nine per cent of heat was produced with peat.

Electricity and heat production by production mode in 2010

	Electricity, TWh	District heat, TWh	Industrial heat, TWh	Total fuels used, PJ ¹⁾
Separate production of electricity				
- Hydro power	12,7	–	–	–
- Wind power	0,3	–	–	–
- Nuclear power	21,9	–	–	–
- Condensing power ²⁾	14,2	–	–	136,8
- Total	49,1	–	–	136,8
Combined heat and power production	28,1	29,2	46,6	450,9
Separate heat production	–	9,7	8,2	74,8
Total production	77,2	39,0	54,8	662,5
Net imports of electricity	10,5	–	–	–
Total	87,7	39,0	54,8	662,5

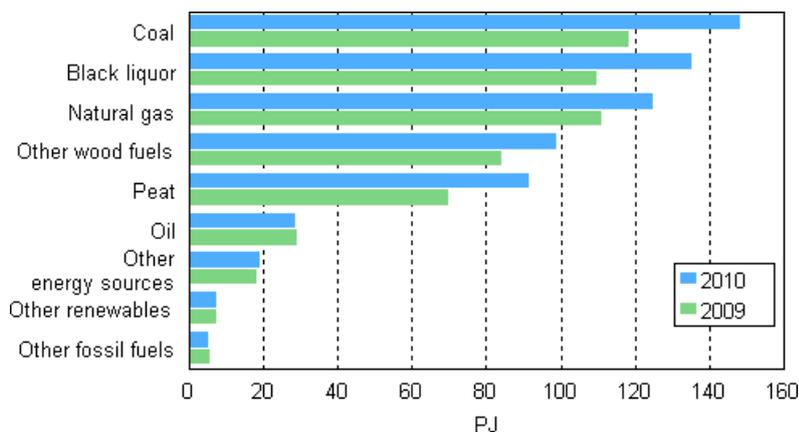
1) In calculating total primary energy used, hydro power, wind power and net imports of electricity are made commensurate with fuels according to directly obtained electricity (3.6 PJ/TWh). Total nuclear energy used is calculated at the efficiency ratio of 33 per cent from produced nuclear power (10.91 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 **use of fuels** in the production of electricity and heat increased by 19 per cent in 2010. Slightly less than one half of fuel use was covered by fossil fuels, 22 per cent by coal and 19 per cent by natural gas. The use of renewable fuels accounted for 37 per cent, that of black liquor from the forestry industry for 20 per cent and that of other wood fuels for 15 per cent. The use of peat amounted to 14 per cent.

Compared with the previous year, the use of coal grew by 25 per cent, that of wood fuels by 21 per cent and that of peat by 31 per cent.

Use of fuels in electricity and heat production in 2009 and 2010



The statistics on production of electricity and heat cover the entire production of electricity. The statistics do not include small district heating plants or industrial enterprises.

Links:

Statistics Finland:

http://tilastokeskus.fi/keruu/ene/index_en.html

Finnish Energy Industries:

<http://www.energia.fi/en/statistics-and-publications/electricity-statistics>

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Appendix tables

Appendix table 1. Electricity and heat production by production mode and fuel in 2010

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Condensing power production ¹⁾	Oil	108	..	..	369	1 329
	Coal ²⁾	9 760	..	..	25 195	90 702
	Natural gas	191	..	..	562	2 024
	Other fossil ³⁾⁴⁾	61	..	..	205	739
	Peat	2 392	..	..	6 479	23 323
	Black liquor and other concentrated liquors	319	..	..	1 075	3 870
	Other wood fuels	1 081	..	..	3 105	11 176
	Other renewables ³⁾⁵⁾	146	..	..	416	1 497
	Other energy sources ⁶⁾	120	..	..	594	2 140
	Total	14 179	..	..	38 000	136 801
Combined heat and power production ⁷⁾	Oil	338	291	1 468	2 433	8 759
	Coal ²⁾	4 288	7 422	1 187	15 160	54 576
	Natural gas	10 786	9 080	5 624	29 695	106 902
	Other fossil ³⁾⁴⁾	129	209	320	897	3 228
	Peat	3 460	6 334	4 261	17 003	61 211
	Black liquor and other concentrated liquors	5 012	233	24 319	36 440	131 182
	Other wood fuels	3 547	5 097	7 951	20 365	73 313
	Other renewables ³⁾⁵⁾	271	334	505	1 431	5 152
	Other energy sources ⁶⁾	267	208	945	1 815	6 535
	Total	28 098	29 208	46 580	125 238	450 858
Separate production of heat ⁸⁾	Oil	..	2 339	1 663	5 310	19 117
	Coal ²⁾	..	675	152	911	3 280
	Natural gas	..	2 789	1 222	4 509	16 231
	Other fossil ³⁾⁴⁾	..	248	48	407	1 464
	Peat	..	1 155	563	2 019	7 268
	Black liquor and other concentrated liquors	..	..	135	150	539
	Other wood fuels	..	1 457	2 109	4 183	15 058
	Other renewables ³⁾⁵⁾	..	200	75	340	1 224
	Other energy sources ⁶⁾	..	887	2 249	2 962	10 664
	Total	..	9 749	8 216	20 790	74 844

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Total	Oil	447	2 630	3 131	8 112	29 205
	Coal ²⁾	14 047	8 097	1 339	41 266	148 559
	Natural gas	10 977	11 869	6 846	34 766	125 156
	Other fossil ³⁾⁴⁾	190	456	368	1 509	5 431
	Peat	5 852	7 489	4 825	25 501	91 802
	Black liquor and other concentrated liquors	5 331	233	24 453	37 664	135 590
	Other wood fuels	4 629	6 554	10 060	27 652	99 547
	Other renewables ³⁾⁵⁾	417	534	580	2 187	7 873
	Other energy sources ⁶⁾	387	1 095	3 194	5 372	19 370
	Total	42 277	38 958	54 796	184 029	662 503

- 1) Condensate parts produced in connection with combined heat and power production were calculated with condensing power.
- 2) In addition to hard coal, coal includes blast furnace gas and coke oven gas and coke.
- 3) Mixed fuels (such as recycled fuel) are divided into renewable and fossil fuels in ratio to the fossil and biodegradable coal contained in them.
- 4) Other fossil fuels include plastics fuels and other waste fuels and the fossil part of mixed fuels.
- 5) Other renewable fuels comprise the bio part of mixed fuels and biogas.
- 6) Other energy sources include hydrogen, electricity, and reaction and secondary heat of industry.
- 7) Combined heat and power production includes pure combined production.
- 8) Reduction heat produced in connection with condensate production and combined heat and power production were calculated in separate production of heat.

Appendix table 2. Fuel use in electricity and heat production, TJ

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fossil fuels											
- Oil	33 680	38 183	37 873	38 016	35 996	33 118	31 122	31 935	28 233	29 571	29 205
- Coal	104 612	123 888	140 591	199 594	175 841	86 498	172 691	147 656	98 948	118 761	148 559
- Natural gas	117 387	129 063	127 718	143 158	138 375	124 230	131 457	118 038	122 324	111 565	125 156
- Other, fossil	2 463	3 323	3 776	4 293	4 697	4 268	3 719	4 059	4 557	5 855	5 431
- Total	258 142	294 456	309 959	385 061	354 908	248 114	338 989	301 687	254 062	265 752	308 351
Peat	61 108	84 529	89 885	99 213	87 947	67 585	91 201	100 254	79 689	70 336	91 802
Renewable fuels											
- Black liquor and other concentrated liquors	137 929	126 744	140 115	141 194	148 217	132 127	156 030	153 060	143 746	110 131	135 590
- Other wood fuels	76 198	75 932	79 984	81 957	89 239	85 678	93 564	82 768	92 889	84 407	99 547
- Other renewables	2 909	3 577	3 584	4 334	5 083	6 471	5 713	6 705	7 632	7 869	7 873
- Renewable fuels total	217 036	206 253	223 683	227 485	242 539	224 276	255 307	242 533	244 266	202 408	243 010
Other energy sources	16 247	15 693	16 572	20 283	21 435	20 737	23 924	22 210	27 358	18 593	19 340
Total	552 533	600 931	640 099	732 042	706 830	560 712	709 421	666 684	605 375	557 088	662 503

Appendix table 3. Production and total consumption of electricity, GWh

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Nuclear power	21 575	21 854	21 395	21 830	21 814	22 356	22 004	22 501	22 050	22 601	21 889
Fossil fuels											
- Oil	540	610	836	910	570	454	439	431	619	486	447
- Coal	8 636	10 556	12 437	18 487	15 924	6 687	15 842	13 615	8 547	10 785	14 047
- Natural gas	9 856	11 182	11 273	13 435	12 370	10 896	11 941	10 250	10 719	9 543	10 977
- Other, fossil	69	111	120	170	190	167	127	158	161	206	190
- Fossil, total	19 099	22 459	24 667	33 002	29 054	18 204	28 349	24 454	20 046	21 021	25 661
Peat	3 689	5 797	6 142	6 831	6 120	4 208	6 207	6 918	4 868	4 122	5 852
Renewable fuels											
- Hydro power	14 453	13 018	10 623	9 455	14 865	13 428	11 313	13 991	16 909	12 573	12 743
- Wind power	77	70	63	92	120	168	153	188	261	277	294
- Black liquor and other concentrated liquors	5 126	4 765	5 140	5 255	5 778	5 060	5 901	5 711	5 312	4 285	5 331
- Other wood fuels	2 901	2 863	3 175	3 354	3 815	3 643	4 054	3 391	4 183	3 608	4 629
- Other renewables	123	167	160	203	245	291	248	318	343	360	417
- Renewable fuels total	22 679	20 882	19 162	18 359	24 823	22 591	21 669	23 599	27 009	21 102	23 414
Other energy sources	234	237	252	355	360	298	395	345	503	360	387
Total production	67 278	71 229	71 618	80 377	82 171	67 657	78 623	77 817	74 475	69 207	77 203
Net imports of electricity	11 880	9 959	11 925	4 852	4 870	17 014	11 401	12 557	12 772	12 085	10 501
Total	79 158	81 188	83 543	85 229	87 041	84 671	90 024	90 374	87 247	81 292	87 703

Appendix table 4. District heat production, GWh

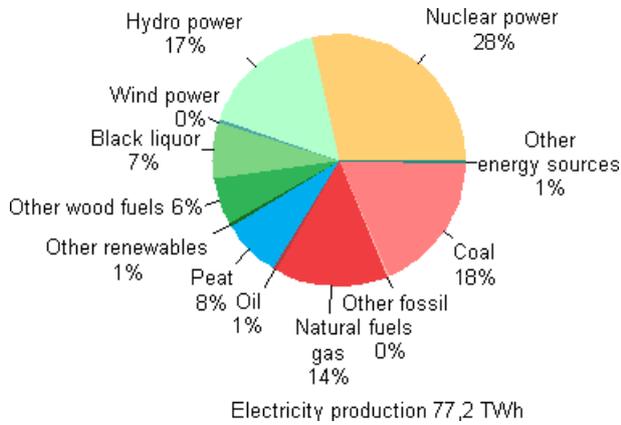
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fossil fuels											
- Oil	1 776	2 309	2 335	2 488	2 005	1 849	2 277	2 285	1 787	2 626	2 630
- Coal	7 520	8 497	8 782	9 089	8 277	7 767	8 935	8 344	7 290	8 184	8 097
- Natural gas	9 628	10 083	10 449	10 355	11 071	11 088	9 849	9 904	10 767	10 462	11 869
- Other, fossil	186	217	213	263	301	298	241	241	381	469	456
- Fossil, total	19 110	21 107	21 779	22 195	21 654	21 002	21 303	20 774	20 224	21 741	23 053
Peat	4 862	5 634	6 026	6 459	6 033	5 465	6 132	7 020	6 133	6 309	7 489
Renewable fuels											
- Black liquor and other concentrated liquors	367	396	282	286	286	267	375	205	222	207	233
- Other wood fuels	2 683	2 808	3 273	3 490	3 789	4 207	4 412	3 940	4 850	5 592	6 554
- Other renewables	210	233	230	281	370	601	443	530	674	679	534
- Renewable fuels total	3 260	3 437	3 784	4 057	4 445	5 075	5 229	4 676	5 746	6 477	7 321
Other energy sources	952	826	874	1 036	1 006	1 090	1 029	996	1 434	1 069	1 095
Total	28 183	31 004	32 464	33 747	33 138	32 631	33 693	33 466	33 538	35 596	38 958

Appendix table 5. Industrial heat production, GWh

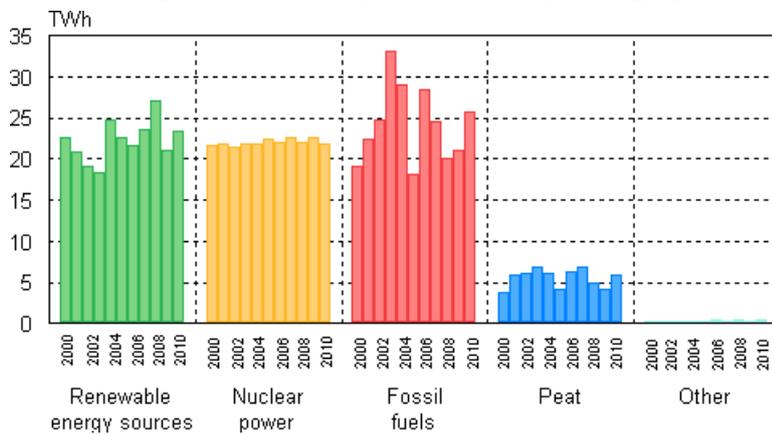
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fossil fuels											
- Oil	4 771	4 641	4 653	4 232	4 381	4 176	3 739	3 738	3 244	2 989	3 131
- Coal	2 488	2 217	2 167	1 958	1 957	1 854	1 672	1 656	1 554	1 282	1 339
- Natural gas	7 958	8 313	7 753	7 471	7 936	7 243	7 504	7 388	6 822	6 354	6 846
- Other, fossil	161	251	319	378	389	332	280	346	346	440	368
- Fossil, total	15 378	15 423	14 892	14 039	14 663	13 605	13 195	13 127	11 967	11 066	11 684
Peat	4 185	4 412	5 008	5 268	4 410	4 064	4 740	5 251	4 805	4 198	4 825
Renewable fuels											
- Black liquor and other concentrated liquors	23 177	21 259	23 730	23 626	24 659	22 015	26 632	26 571	25 714	19 890	24 453
- Other wood fuels	10 809	10 507	10 502	10 398	11 033	10 160	11 227	10 621	10 611	9 241	10 060
- Other renewables	312	352	384	454	460	510	528	553	533	565	580
- Renewable fuels total	34 299	32 118	34 616	34 477	36 152	32 685	38 388	37 744	36 858	29 696	35 094
Other energy sources	2 768	2 752	2 776	3 265	3 502	3 364	4 192	3 796	4 521	2 992	3 194
Total	56 630	54 705	57 293	57 049	58 727	53 718	60 514	59 918	58 151	47 951	54 796

Appendix figures

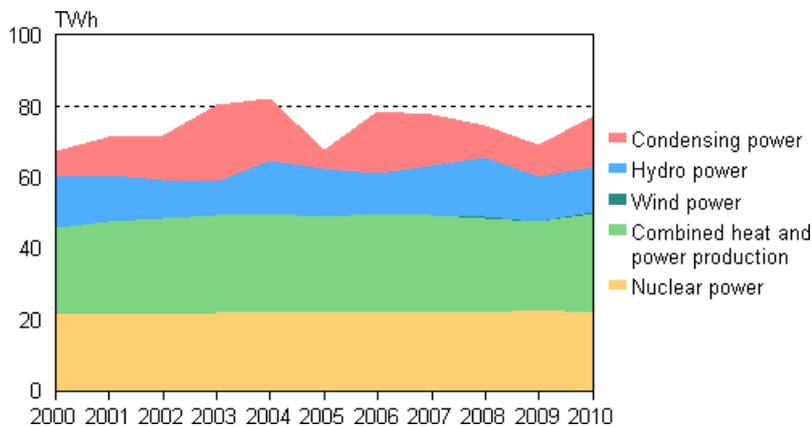
Appendix figure 1. Electricity production by energy sources 2010



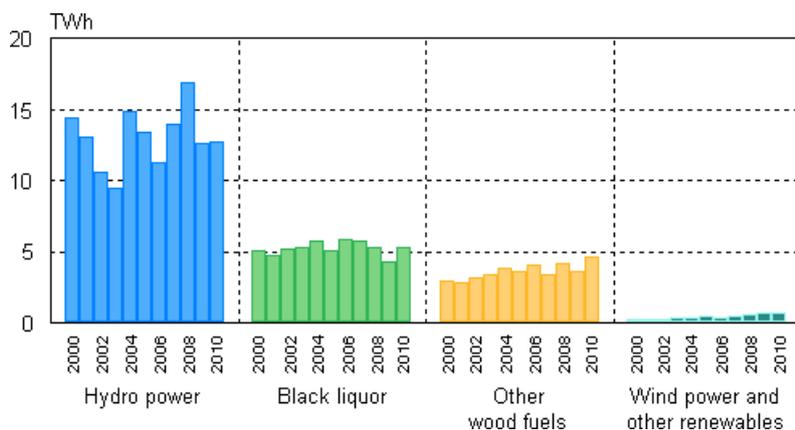
Appendix figure 2. Electricity production by energy type 2000–2010



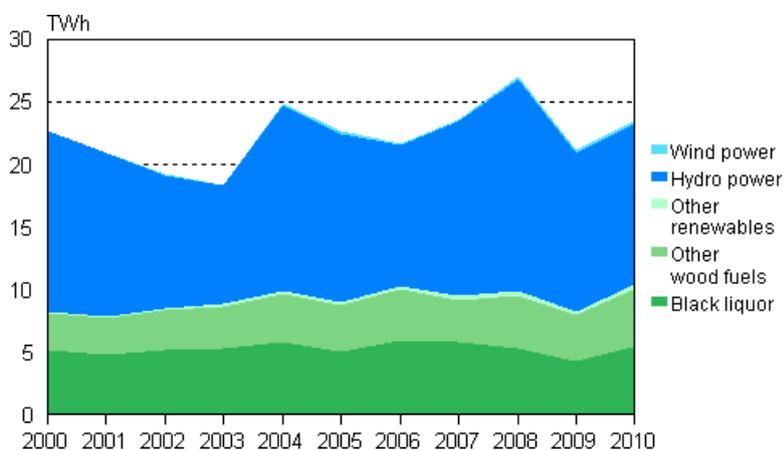
Appendix figure 3. Electricity production by production mode 2000–2010



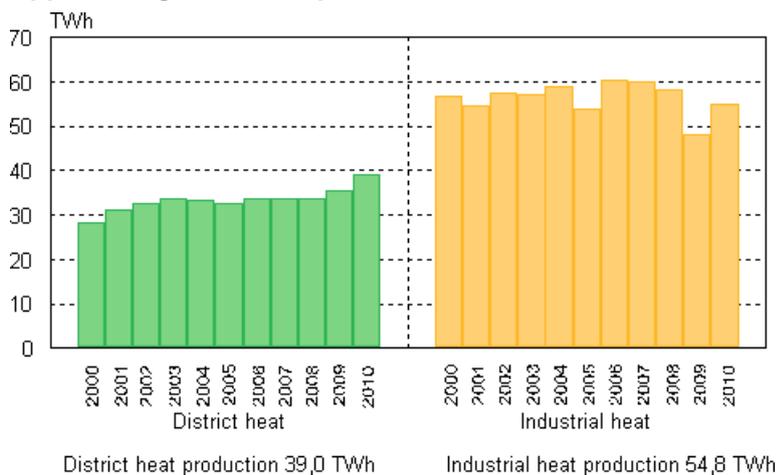
Appendix figure 4. Electricity production with renewable energy sources 2000–2010



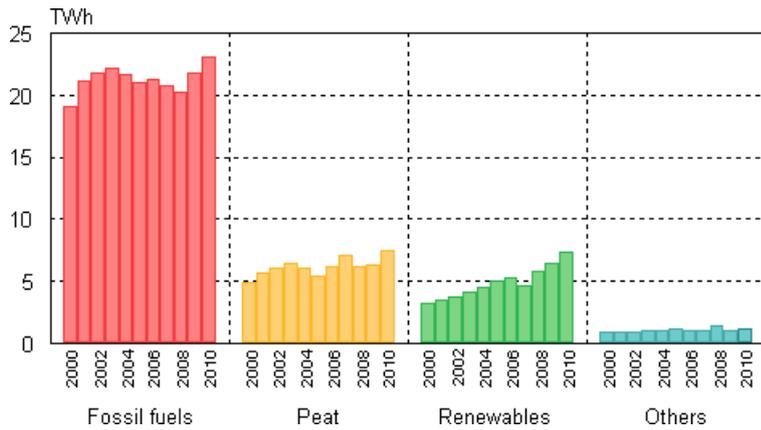
Appendix figure 5. Electricity production with renewable energy sources 2000–2010



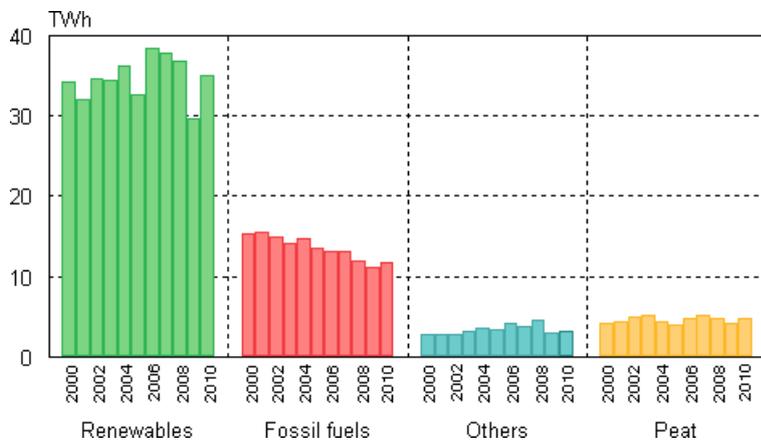
Appendix figure 6. Heat production 2000–2010



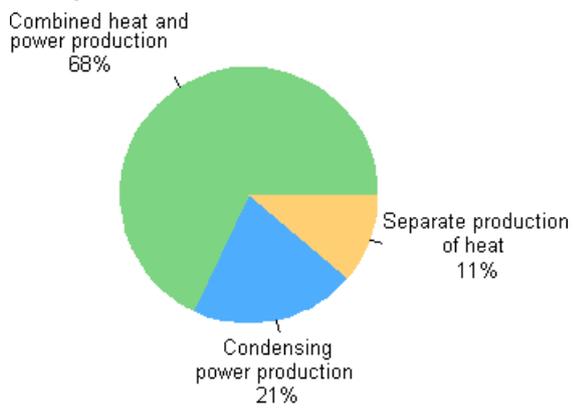
Appendix figure 7. District heat production by fuels 2000–2010



Appendix figure 8. Industrial heat production by fuels 2000–2010

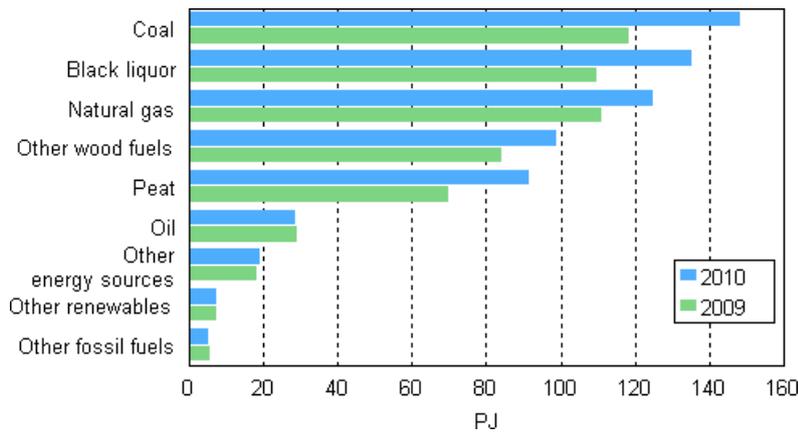


Appendix figure 9. Fuel use by production mode in electricity and heat production 2010

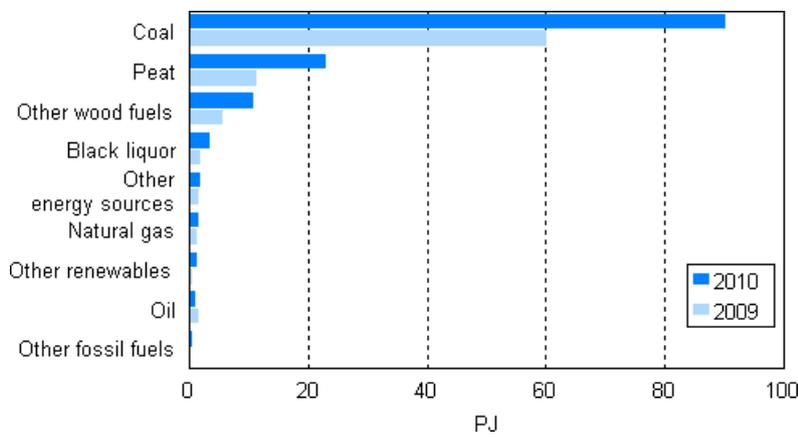


Total use of fuels 663 PJ or 184 TWh

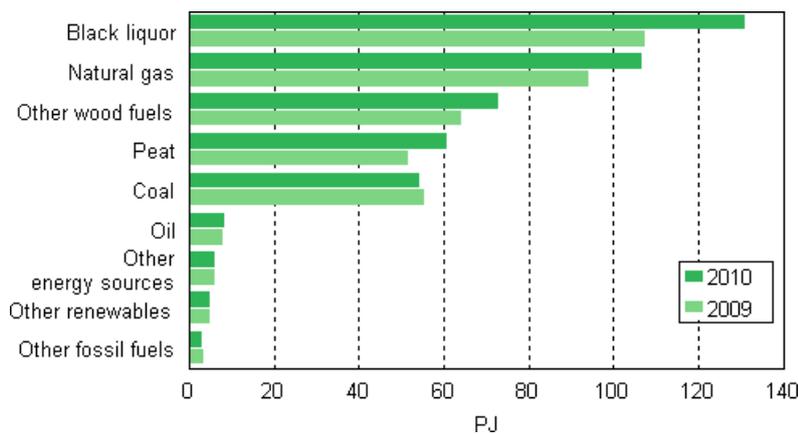
Appendix figure 10. Fuel use in electricity and heat production 2009–2010



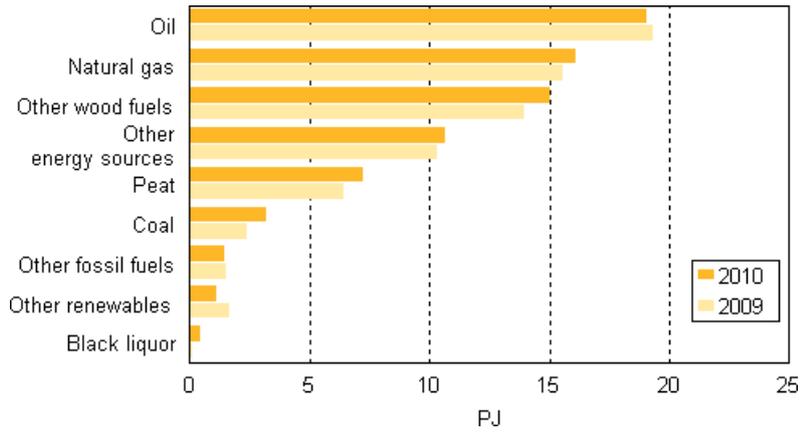
Appendix figure 11. Fuel use in separate electricity production 2009–2010



Appendix figure 12. Fuel use in combined heat and power production 2009–2010



Appendix figure 13. Fuel use in separate heat production 2009–2010



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