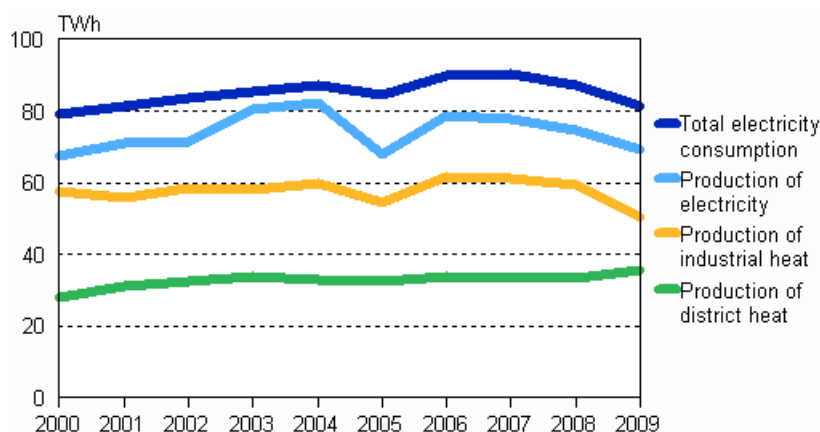


Production of electricity and heat 2009

Production of electricity and industrial heat decreased in 2009

According to Statistics Finland's statistics on production of electricity and heat, production and total consumption of electricity fell by seven per cent in 2009. Electricity produced with hydro power and wood fuels declined by 26 and 17 per cent, respectively. At the same time, separate production of electricity with coal grew by 38 per cent. The need for and production of industrial heat decreased by 15 per cent as industrial output declined due to the economic downturn. Production of district heat, in turn, grew by six per cent, because the colder weather than last year increased the need for heating.

Production of electricity, district heat and industrial heat in 2000—2009



In 2009, total electricity consumption in Finland amounted to 81.3 terawatt hours (TWh) or billion kilowatt hours (kWh). Of this consumption, 85 per cent was covered by domestic production and the remaining 15 per cent by imported 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.

In 2009, the volume of electricity produced in Finland amounted to 69.2 TWh. The volume of electricity produced was seven per cent lower than one year previously. The production of district heat rose by six per cent and 15 per cent less heat was produced for industry than the year before. The production of district heat amounted to 35.5 TWh and that of industrial heat to 50.5 TWh.

The volume of electricity produced with renewable energy sources decreased by 22 per cent from the year before. The bad water situation in the Nordic countries reduced the domestic production of hydro power by 26 per cent. The decrease in renewable energy sources was also due to the industrial downturn, because the electricity produced with black liquor from the forest industry fell by 19 per cent and the electricity produced with other wood fuels went down by 14 per cent from the year before. The share of electricity produced with renewable energy sources in electricity production fell from its 36 per cent share to 30 per cent. In the production of renewable electricity hydro power accounts for 60 per cent, black liquor from the forest industry for 20 per cent and wood fuels for 17 per cent.

Electricity produced with coal went up by 26 per cent and the growth was biggest in the production of condensing power.

In all, 30 per cent of electricity was produced with renewable energy sources, 33 per cent with nuclear power and 30 per cent with fossil fuels. Eighteen per cent of electricity was produced with hydro power, 16 per cent with coal and 14 per cent with natural gas. Combined heat and power production remained as the most significant mode of electricity generation; it accounted for 36 per cent of all electricity produced in 2009.

Electricity and heat production by production mode in 2009

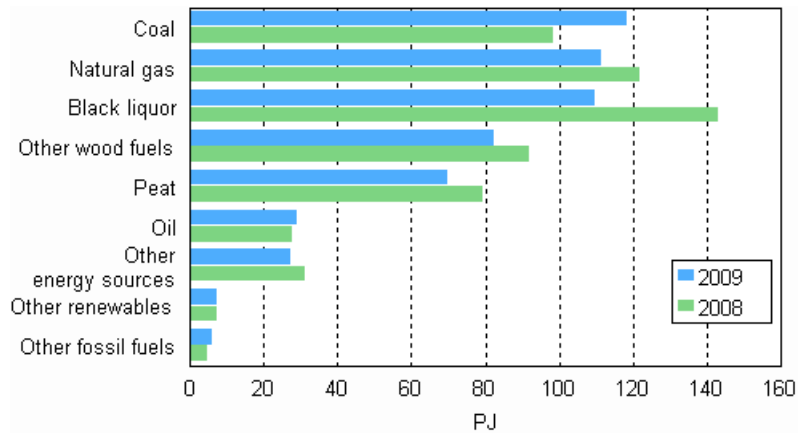
	Electricity, TWh	District heat, TWh	Industrial heat, TWh	Total fuels used, PJ ¹⁾
Separate production of electricity				
- Hydro power	12,6	-	-	-
- Wind power	0,3	-	-	-
- Nuclear power	22,6	-	-	-
- Condensing power ²⁾	9,0	-	-	86,3
- Total	44,4	-	-	86,3
Combined heat and power production	24,8	26,6	40,2	399,2
Separate heat production	-	8,8	10,3	79,6
Total production	69,2	35,5	50,5	565,1
Net imports of electricity	12,1	-	-	-
Total	81,3	35,5	50,5	565,1

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 decreased by seven per cent in 2009.

Use of fuels in electricity and heat production in 2000—2009



Links:

Statistics Finland:

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

Finnish Energy Industries:

<http://www.energia.fi/en/statistics/rapidreport>

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Appendix tables

Appendix table 1. Electricity and heat production by production mode and fuel in 2009

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Condensing power production ¹⁾	Oil	185	..	..	559	2 013
	Coal ²⁾	6 452	..	..	16 820	60 552
	Natural gas	155	..	..	403	1 450
	Other fossil ³⁾⁴⁾	50	..	..	155	559
	Peat	1 177	..	..	3 193	11 496
	Black liquor and other concentrated liquors	207	..	..	501	1 802
	Other wood fuels	555	..	..	1 581	5 693
	Other renewables ³⁾⁵⁾	79	..	..	229	826
	Other energy sources ⁶⁾	105	..	..	527	1 898
	Total	8 963	..	..	23 969	86 289
Combined heat and power production ⁷⁾	Oil	301	339	1 280	2 278	8 202
	Coal ²⁾	4 341	7 745	1 118	15 474	55 708
	Natural gas	9 389	8 008	5 012	26 234	94 442
	Other fossil ³⁾⁴⁾	158	225	382	1 036	3 729
	Peat	2 945	5 364	3 660	14 545	52 361
	Black liquor and other concentrated liquors	4 078	207	19 851	30 025	108 092
	Other wood fuels	3 038	4 165	7 466	18 048	64 974
	Other renewables ³⁾⁵⁾	280	348	495	1 470	5 292
	Other energy sources ⁶⁾	261	242	906	1 785	6 426
	Total	24 793	26 643	40 170	110 896	399 225
Separate production of heat ⁸⁾	Oil	..	2 240	1 781	5 381	19 371
	Coal ²⁾	..	450	166	692	2 490
	Natural gas	..	2 455	1 431	4 424	15 928
	Other fossil ³⁾⁴⁾	..	365	72	584	2 101
	Peat	..	910	564	1 751	6 305
	Black liquor and other concentrated liquors	..	..	59	66	237
	Other wood fuels	..	1 162	1 654	3 347	12 051
	Other renewables ³⁾⁵⁾	..	329	71	486	1 749
	Other energy sources ⁶⁾	..	916	4 517	5 378	19 361
	Total	..	8 826	10 314	22 109	79 593

		Electricity, GWh	District heat, GWh	Industrial heat, GWh	Fuels used, GWh	Fuels used, TJ
Total	Oil	486	2 578	3 061	8 218	29 586
	Coal ²⁾	10 793	8 195	1 284	32 986	118 750
	Natural gas	9 544	10 463	6 443	31 061	111 821
	Other fossil ³⁾⁴⁾	208	590	454	1 775	6 389
	Peat	4 122	6 274	4 224	19 489	70 162
	Black liquor and other concentrated liquors	4 285	207	19 909	30 592	110 131
	Other wood fuels	3 593	5 326	9 120	22 977	82 717
	Other renewables ³⁾⁵⁾	359	677	566	2 185	7 867
	Other energy sources ⁶⁾	365	1 158	5 423	7 690	27 685
	Total	33 757	35 468	50 485	156 974	565 107

- 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
Fossil fuels										
- Oil	33 695	38 138	37 874	38 015	35 995	33 117	31 033	31 924	28 230	29 586
- Coal	104 612	123 888	140 591	199 594	175 841	86 498	172 691	147 656	98 945	118 750
- Natural gas	117 387	129 063	127 718	143 158	138 375	124 230	131 457	118 038	122 324	111 821
- Other fossil	2 498	3 367	3 809	4 321	4 685	4 286	3 738	4 079	5 338	6 389
- Fossil fuels total	258 191	294 455	309 992	385 087	354 896	248 131	338 919	301 697	254 837	266 545
Peat	61 056	84 475	89 831	99 122	87 856	67 492	91 082	100 097	79 601	70 162
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
- Other wood fuels	76 005	75 719	79 612	81 595	88 871	85 239	93 094	82 305	92 361	82 717
- Other renewables	2 875	3 544	3 552	4 308	4 770	6 452	5 694	6 685	7 590	7 867
- Renewable fuels total	216 809	206 008	223 279	227 097	241 858	223 819	254 817	242 050	243 696	200 715
Other energy sources	19 598	18 990	20 863	24 728	25 875	24 443	28 076	26 594	31 357	27 685
Total	555 654	603 928	643 965	736 035	710 486	563 885	712 894	670 438	609 491	565 107

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

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Nuclear power	21 575	21 854	21 395	21 830	21 814	22 356	22 004	22 501	22 050	22 601
Fossil fuels										
- Oil	540	610	836	910	570	454	439	431	394	486
- Coal	8 636	10 556	12 437	18 487	15 946	6 687	15 842	13 615	8 546	10 793
- Natural gas	9 856	11 182	11 273	13 435	12 372	10 896	11 941	10 250	10 935	9 544
- Other fossil	70	112	122	171	189	168	128	159	221	208
- Fossil fuels total	19 101	22 460	24 668	33 003	29 076	18 205	28 349	24 455	20 096	21 032
Peat	3 689	5 797	6 141	6 827	6 118	4 206	6 207	6 917	4 867	4 122
Renewable energy sources										
- Hydro power	14 453	13 018	10 623	9 455	14 865	13 428	11 313	13 991	16 909	12 573
- Wind power	77	70	63	92	120	168	153	188	261	277
- 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
- Other wood fuels	2 901	2 863	3 174	3 348	3 810	3 636	4 050	3 388	4 181	3 593
- Other renewables	121	166	159	202	220	290	247	317	341	359
- Renewables total	22 678	20 881	19 159	18 352	24 794	22 583	21 663	23 594	27 004	21 087
Other energy sources	234	237	255	364	369	307	400	349	457	365
Electricity produced total	67 278	71 229	71 618	80 377	82 171	67 657	78 623	77 817	74 475	69 207
Net imports of electricity	11 880	9 959	11 925	4 852	4 870	17 015	11 401	12 557	12 772	12 085
Total	79 158	81 188	83 543	85 229	87 041	84 672	90 024	90 374	87 247	81 292

Appendix table 4. District heat production, GWh

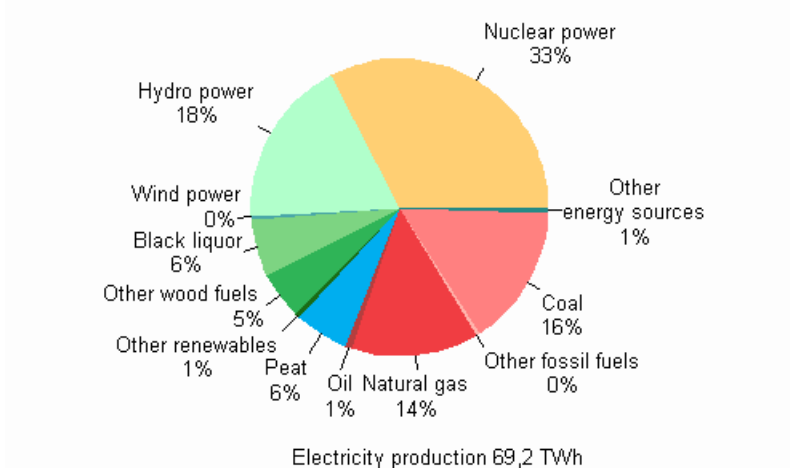
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fossil fuels										
- Oil	1 774	2 302	2 334	2 488	2 005	1 848	2 217	2 227	1 726	2 578
- Coal	7 520	8 497	8 782	9 089	8 304	7 767	8 935	8 344	7 289	8 195
- Natural gas	9 628	10 083	10 449	10 354	11 073	11 088	9 849	9 904	10 749	10 463
- Other fossil	186	218	213	263	298	298	241	241	500	590
- Fossil fuels total	19 108	21 101	21 779	22 194	21 680	21 001	21 243	20 716	20 264	21 826
Peat	4 850	5 622	6 012	6 433	6 009	5 441	6 103	6 980	6 112	6 274
Renewable energy sources										
- Black liquor and other concentrated liquors	367	396	282	286	286	267	375	205	222	207
- Other wood fuels	2 653	2 773	3 230	3 455	3 755	4 169	4 380	3 916	4 798	5 326
- Other renewables	210	232	230	281	340	601	442	530	674	677
- Renewables total	3 230	3 402	3 741	4 022	4 381	5 037	5 197	4 652	5 694	6 211
Other energy sources	944	826	876	1 043	1 012	1 096	1 092	1 056	1 396	1 158
Total	28 131	30 950	32 408	33 692	33 082	32 575	33 635	33 403	33 467	35 468

Appendix table 5. Industrial heat production, GWh

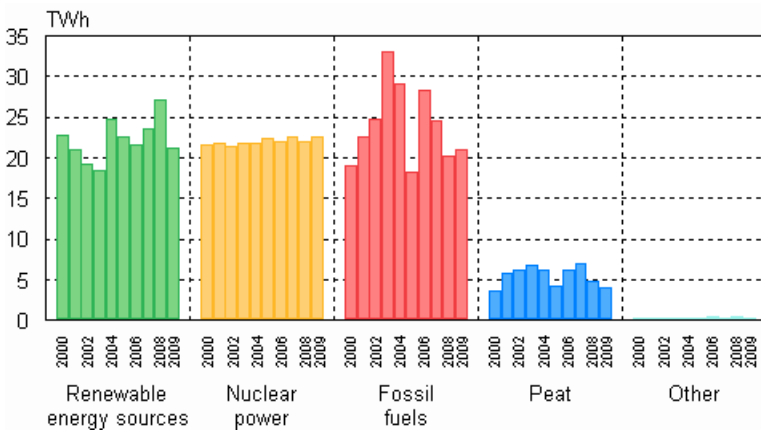
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fossil fuels										
- Oil	4 769	4 637	4 649	4 232	4 381	4 176	3 832	3 808	3 217	3 061
- Coal	2 488	2 217	2 167	1 958	1 957	1 854	1 672	1 656	1 554	1 284
- Natural gas	7 958	8 313	7 753	7 471	7 936	7 243	7 504	7 387	6 946	6 443
- Other fossil	167	257	324	382	393	335	284	350	355	454
- Fossil fuels total	15 382	15 424	14 893	14 043	14 667	13 608	13 292	13 201	12 072	11 241
Peat	4 185	4 412	5 006	5 261	4 407	4 061	4 739	5 249	4 805	4 224
Renewable energy sources										
- Black liquor and other concentrated liquors	23 177	21 259	23 730	23 626	24 659	22 015	26 632	26 571	25 714	19 909
- Other wood fuels	10 795	10 494	10 453	10 333	10 967	10 079	11 142	10 533	10 537	9 120
- Other renewables	307	347	379	449	456	507	524	549	525	566
- Renewables total	34 279	32 100	34 562	34 408	36 082	32 601	38 299	37 652	36 776	29 596
Other energy sources	3 703	3 668	3 959	4 475	4 710	4 369	5 235	4 931	5 699	5 423
Total	57 549	55 604	58 420	58 186	59 865	54 638	61 564	61 033	59 352	50 485

Appendix figures

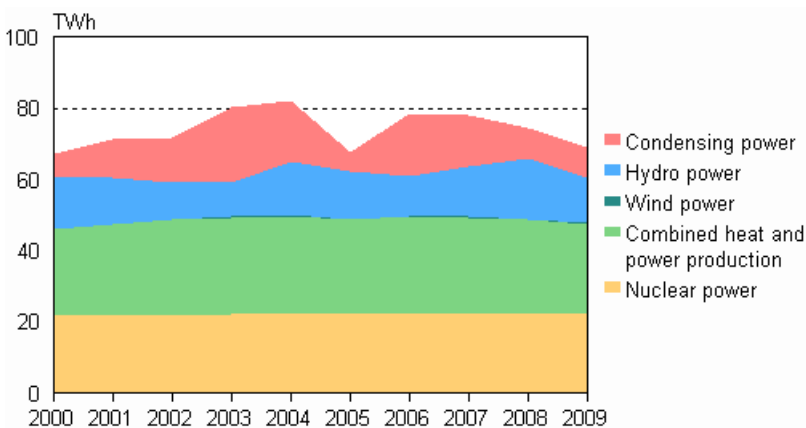
Appendix figure 1. Electricity production by energy sources 2009



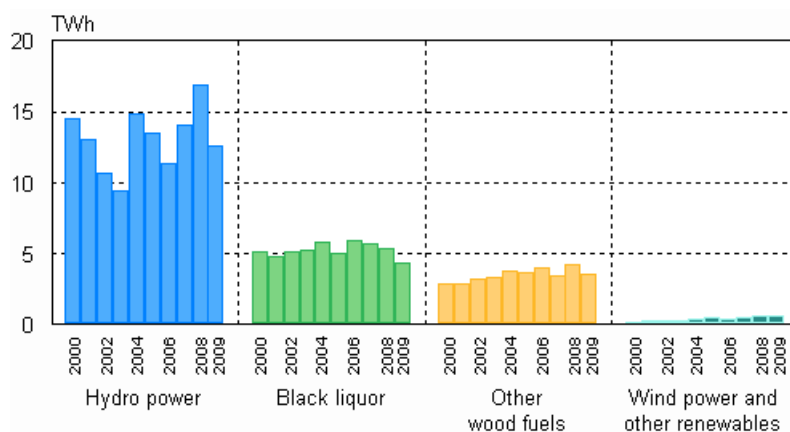
Appendix figure 2. Electricity production by energy type 2000–2009



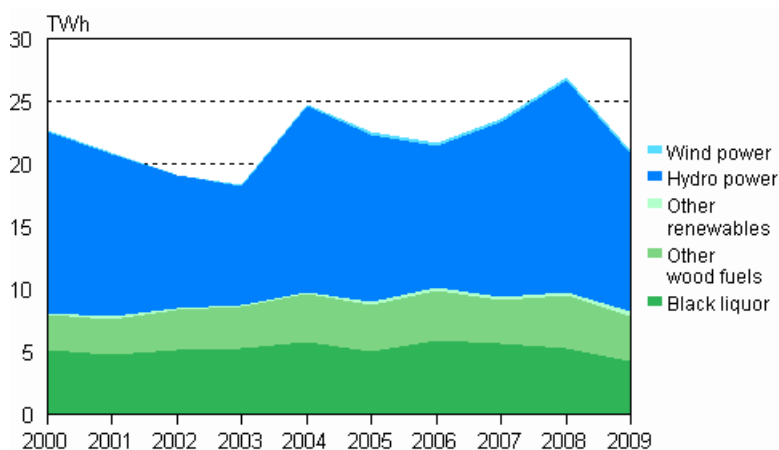
Appendix figure 3. Electricity production by production mode 2000–2009



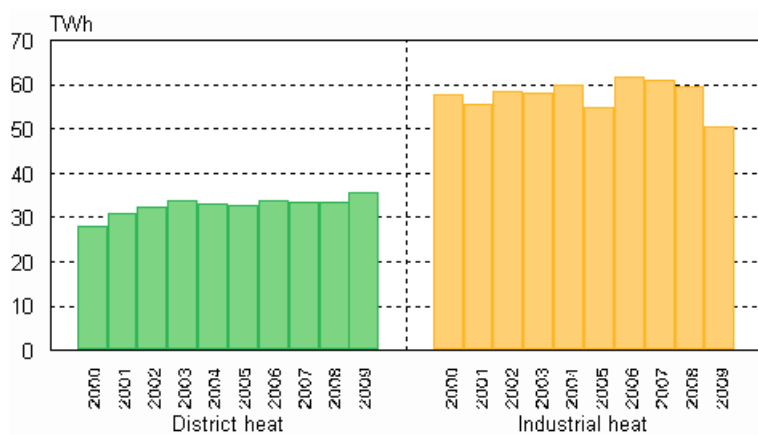
Appendix figure 4. Electricity production with renewable energy sources 2000–2009



Appendix figure 5. Electricity production with renewable energy sources 2000–2009



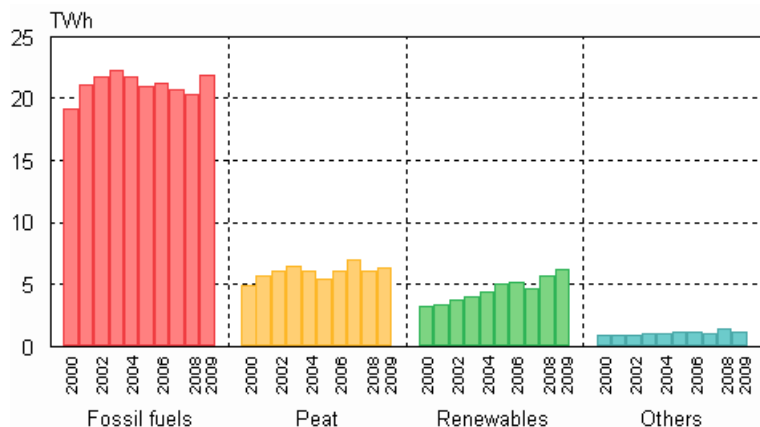
Appendix figure 6. Heat production 2000–2009



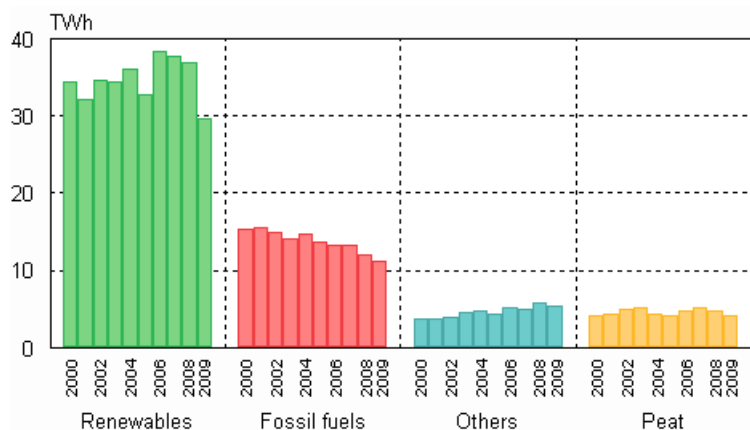
District heat production 35,5 TWh

Industrial heat production 50,5 TWh

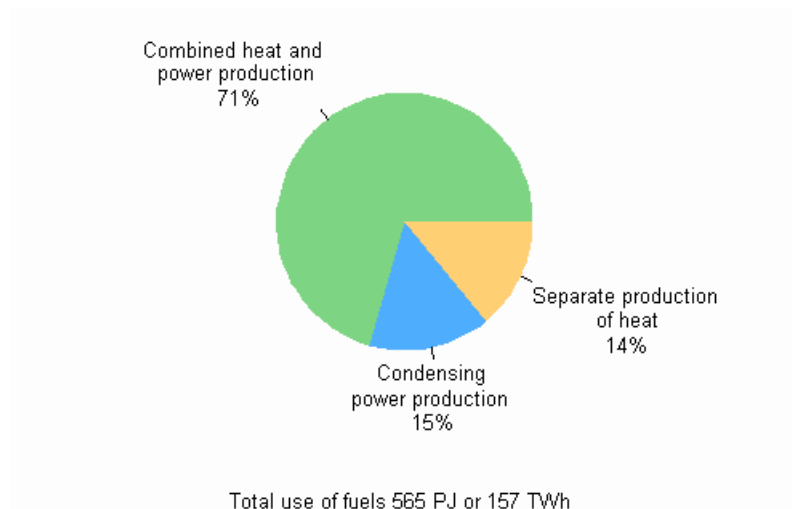
Appendix figure 7. District heat production by fuels 2000–2009



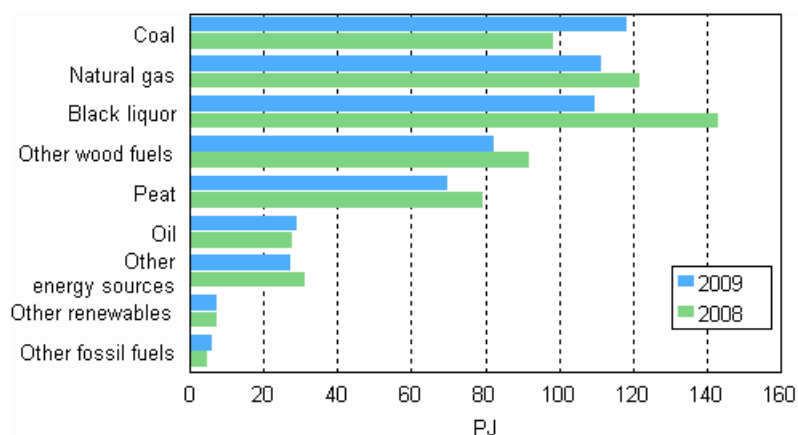
Appendix figure 8. Industrial heat production by fuels 2000–2009



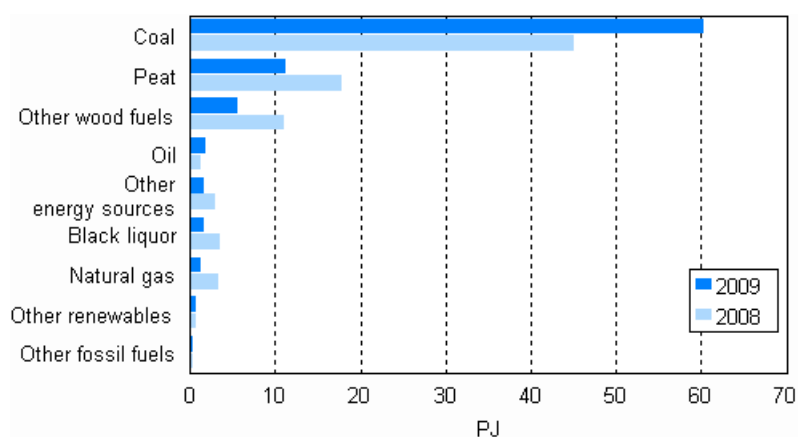
Appendix figure 9. Fuel use by production mode in electricity and heat production 2009



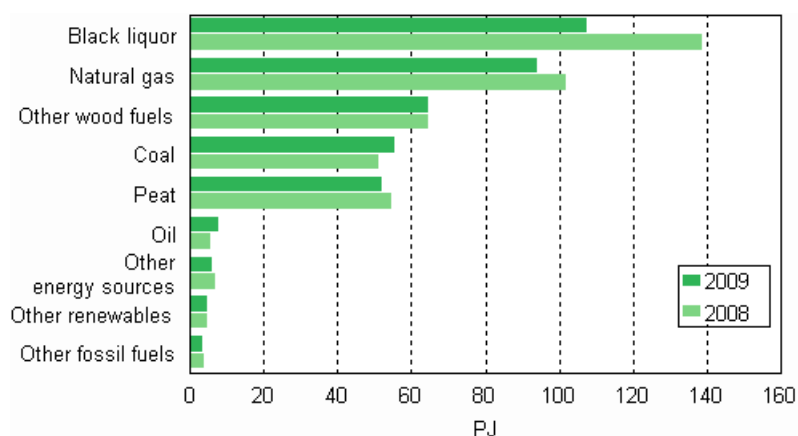
Appendix figure 10. Fuel use in electricity and heat production 2008–2009



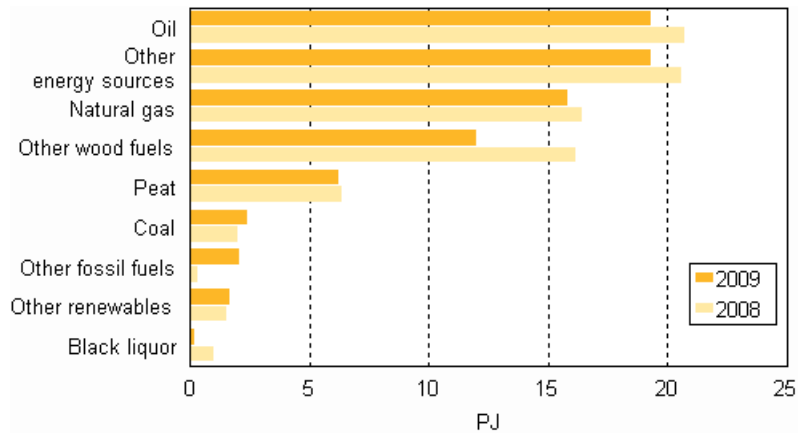
Appendix figure 11. Fuel use in separate electricity production 2008–2009



Appendix figure 12. Fuel use in combined heat and power production 2008–2009



Appendix figure 13. Fuel use in separate heat production 2008–2009



Inquiries

Minna Niininen 09 1734 3549
Director in charge:
Leena Storgårds
energia@stat.fi
www.stat.fi