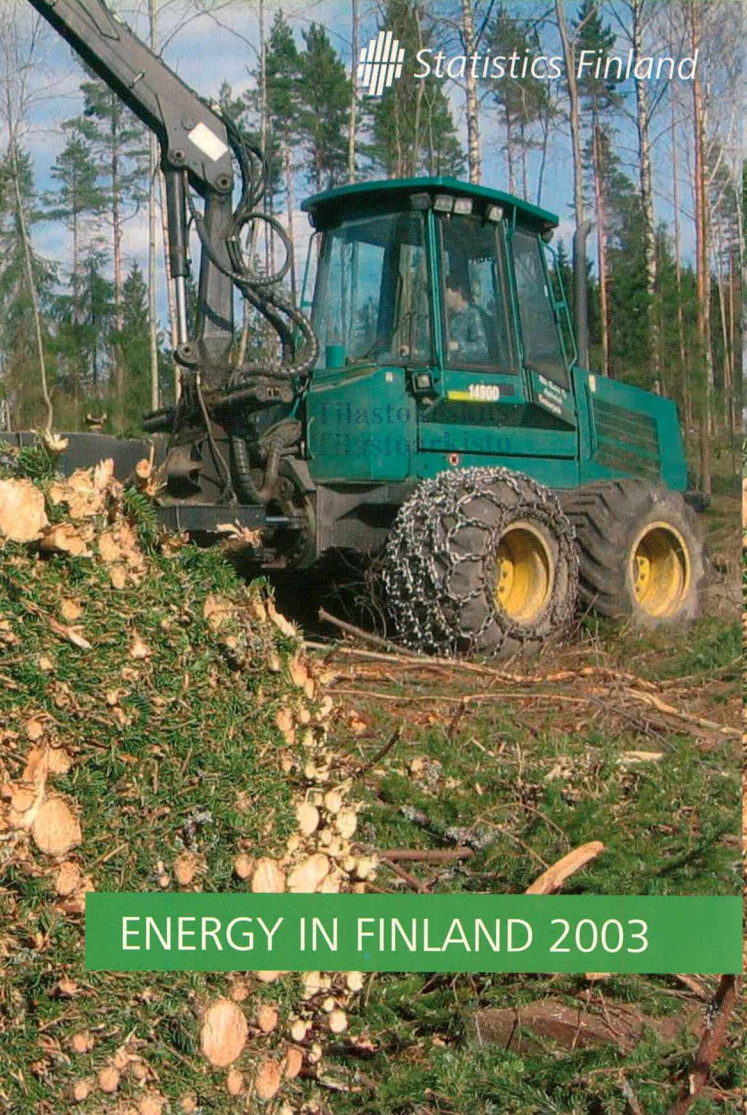

Statistics Finland
ENERGY IN FINLAND 2003

Finland in Brief

Area

Situated in northern Europe with an area of 338,145 km^2 of which 68% forest, 10% water, 8% cultivated land.

Population

5.2 million, with average density of 17 persons per square kilometre. More than two-thirds of the population reside in the southern third of the country.

Average Temperatures

Town	Latitude	January	July
Helsinki	60^0	–5.7^{0}C	+17.0^{0}C
Rovaniemi	66^0	–14.5^{0}C	+14.7^{0}C

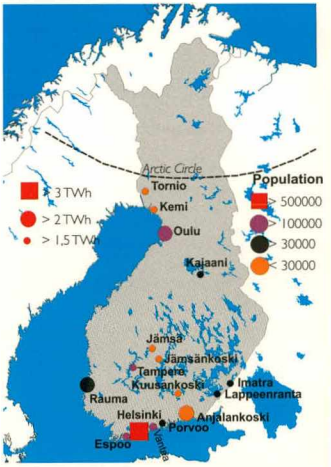
Economy in 2003

GDP totalled € 143 bil., i.e. € 27,512/capita, of which services 67.6%, secondary production 31.1% and primary production 3.5%.

Structure of Industry in 2003, Value Added Gross in Production

	bil. €	%
Total industry	**31.7**	**100**
Mining and quarrying	0.4	1
Forest industry	5.4	17
Chemical industry	3.0	10
Metal industry	3.2	10
Machinery and equipment	3.1	10
Electrical equipment	7.2	23
Other manufacturing ind.	6.6	21
Electricity, gas and water ind.	2.9	9

Municipalities with High Electricity Consumption 2003



Natural Resources

Productive forestland is the most valuable natural resource of Finland. The indigenous energy resources in the country are hydro power, wood and peat. Finland also has some rich deposits of metallic ores from which copper, zinc, iron, and nickel are extracted.

Total Energy Consumption in 2003

1,487 PJ (35.5 Mtoe)
284.9 GJ/capita (6.8 toe/capita)

Electricity Consumption in 2003

85.2 TWh
16,328 kWh/capita

Contents

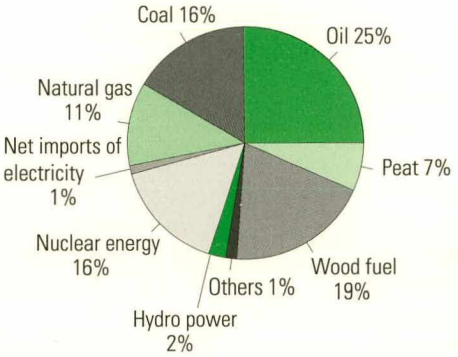
Inquiries:
Kirsi-Marja Aalto
+358 9 1734 3442
energia.tilastokeskus@stat.fi
http://www.stat.fi/energia

Cover Photograph: Timberjack oy, Arto Timperi

ISSN 0784–9354
= Energy
ISSN 1457–0491
ISBN 952–467–375–4

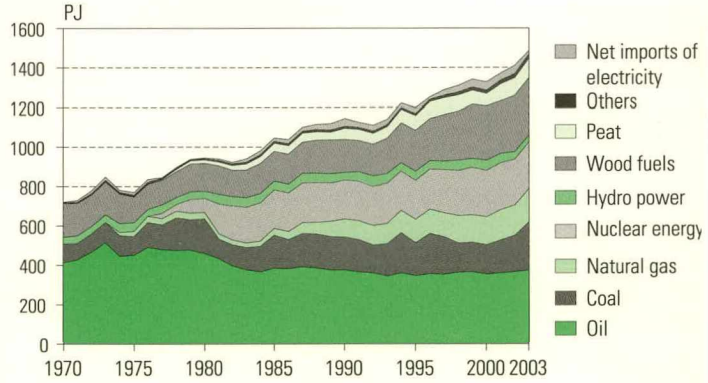
Painojussit Oy, Helsinki 2004

Total Energy Consumption by Energy Source 2003

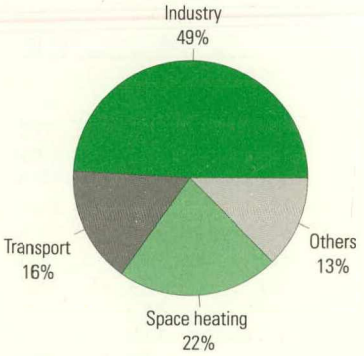


Total energy consumption in 2003 was 1 487 PJ.

Total Energy Consumption by Energy Source 1970–2003

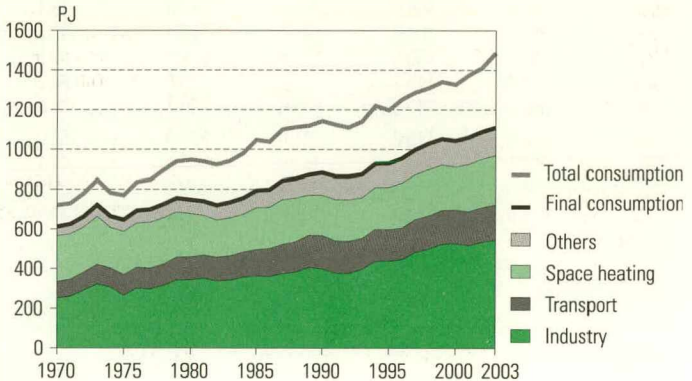


Final Energy Consumption by Sector 2003



Final energy consumption in 2003 was 1 110 PJ.

Total Energy Consumption and Final Energy Consumption by Sector 1970–2003



Total Energy Consumption by Energy Source, PJ

	Oil	Coal	Natural gas	Nuclear energy	Hydro power
1970	412.9	94.8	–	–	33.9
1975	451.0	94.8	26.5	–	43.5
1980	460.3	176.2	32.2	72.3	36.4
1981	433.9	100.0	25.6	150.9	48.7
1982	396.6	108.5	24.2	172.6	46.6
1983	377.2	112.7	23.5	182.4	48.4
1984	365.9	130.1	26.9	194.2	47.2
1985	385.3	167.8	34.1	196.1	44.0
1986	382.1	147.7	41.3	196.3	44.2
1987	391.6	168.5	54.6	202.2	49.2
1988	385.9	172.7	58.8	201.2	47.6
1989	375.0	170.1	77.0	196.5	46.4
1990	376.3	166.8	90.8	197.8	38.7
1991	366.1	164.0	95.7	200.8	47.0
1992	360.5	141.6	99.3	198.2	53.9
1993	345.2	163.8	102.6	205.1	48.0
1994	359.6	204.7	113.3	199.9	42.0
1995	347.0	166.6	117.6	197.8	46.1
1996	356.3	204.8	123.1	203.8	42.2
1997	353.2	190.8	121.1	218.7	42.5
1998	364.4	148.1	138.7	228.8	53.3
1999	366.4	149.6	138.9	240.7	45.3
2000	353.6	149.0	141.9	235.4	52.3
2001	360.1	168.1	153.9	238.4	47.1
2002	365.5	184.7	152.9	233.4	38.5
2003	373.8	244.6	169.2	238.1	34.4
Share					
2003	25%	16%	11%	16%	2%
Annual change					
03/02	2%	32%	11%	2%	–11%

Wind power is included in hydro power. Total amount of wind power in 2003 was 0.331 PJ.

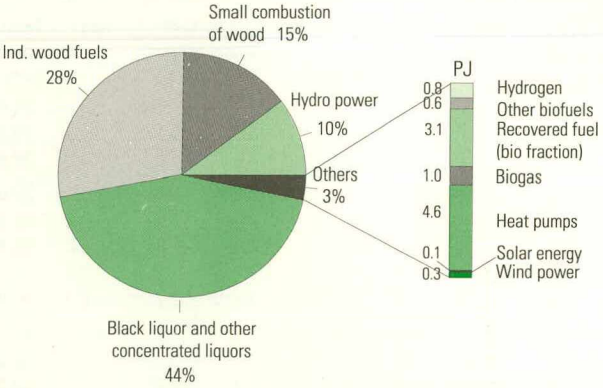
Total Energy Consumption

Wood fuels	Peat	Others	Net imports of electricity	**Total**	
170.1	0.9	6.0	1.9	**720.5**	1970
130.7	1.7	7.2	14.4	**769.8**	1975
142.1	17.1	6.3	4.4	**947.2**	1980
145.1	18.8	8.0	8.1	**939.1**	1981
133.7	23.3	8.8	8.3	**922.7**	1982
141.3	30.4	9.1	17.2	**942.2**	1983
153.2	34.7	9.5	18.8	**980.4**	1984
151.3	41.1	10.3	17.0	**1 047.0**	1985
152.5	43.3	10.1	20.9	**1 038.5**	1986
158.4	45.4	10.2	20.1	**1 100.3**	1987
167.7	41.5	10.6	26.6	**1 112.5**	1988
172.0	39.5	10.5	31.9	**1 119.0**	1989
167.2	55.9	10.8	38.7	**1 142.8**	1990
158.6	56.4	10.1	25.9	**1 124.5**	1991
161.2	55.3	10.7	29.6	**1 110.3**	1992
180.5	58.4	9.9	27.1	**1 140.6**	1993
201.8	66.7	10.0	21.9	**1 219.8**	1994
207.5	74.3	10.5	30.3	**1 197.7**	1995
212.8	84.8	10.9	13.2	**1 251.8**	1996
237.2	83.3	13.0	27.6	**1 287.4**	1997
247.6	79.6	15.4	33.5	**1 309.5**	1998
273.2	70.5	15.8	40.0	**1 340.4**	1999
273.8	61.9	16.3	42.8	**1 326.9**	2000
265.4	85.9	18.6	35.9	**1 373.5**	2001
283.9	89.3	19.7	42.9	**1 410.8**	2002
289.0	98.4	22.2	17.5	**1 487.1**	2003
					Share
19%	7%	2%	1%	**100%**	2003
				Annual	**change**
2%	10%	12%	–59%	5%	03/02

Consumption of Renewables and Hydrogen, PJ

	Hydro power	Industrial wood fuels	Black liquor and others	Small combustion of wood	Others	**Total**	Share of total energy consumption
1970	33.9	20.2	57.7	92.2	..	**204.0**	28%
1975	43.5	14.8	48.3	67.6	..	**174.3**	23%
1980	36.4	31.1	67.4	43.6	0.7	**179.2**	19%
1981	48.7	33.1	68.2	43.7	1.1	**194.8**	21%
1982	46.6	29.4	60.5	43.8	1.4	**181.8**	20%
1983	48.4	30.7	66.6	44.0	1.7	**191.5**	20%
1984	47.2	34.4	74.7	44.0	2.0	**202.4**	21%
1985	44.0	31.6	75.5	44.1	2.6	**197.8**	19%
1986	44.2	31.1	77.2	44.2	2.3	**199.0**	19%
1987	49.2	32.4	81.6	44.4	2.6	**210.1**	19%
1988	47.6	35.0	88.1	44.5	2.3	**217.5**	20%
1989	46.4	36.3	91.1	44.6	2.0	**220.5**	20%
1990	38.7	36.5	86.1	44.7	2.4	**208.3**	18%
1991	47.0	32.9	80.9	44.8	2.6	**208.3**	19%
1992	53.8	32.8	83.5	44.9	2.6	**217.6**	20%
1993	48.0	40.4	95.1	45.0	2.8	**231.3**	20%
1994	42.0	52.4	104.4	45.0	2.8	**246.5**	20%
1995	46.0	53.9	109.0	44.7	3.5	**257.1**	21%
1996	42.1	56.2	109.6	46.9	3.7	**258.7**	21%
1997	42.5	61.6	128.5	47.0	4.0	**283.6**	22%
1998	53.2	64.7	135.4	47.6	5.6	**306.4**	23%
1999	45.2	84.0	142.6	46.6	6.1	**324.4**	24%
2000	52.0	84.9	143.5	45.3	6.6	**332.4**	25%
2001	46.9	83.9	133.7	47.8	8.1	**320.3**	23%
2002	38.2	89.6	145.6	48.7	8.5	**330.7**	23%
2003	34.0	93.3	147.0	48.7	10.4	**333.4**	22%

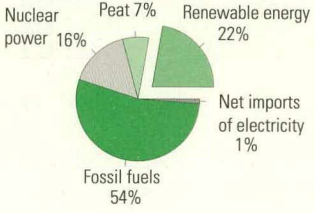
Consumption of Renewables 2003



The total consumption of renewable energy sources in 2003 was 333 PJ which is 22% of total energy consumption.

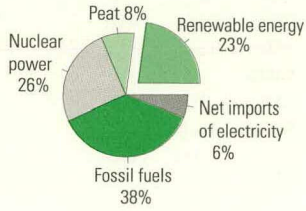
Share of Renewables 2003

In Total Energy Consumption



Total 1 487 PJ

In Electricity Consumption



Total 85 TWh

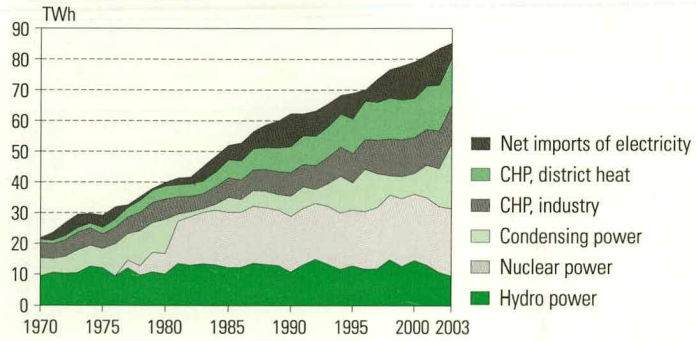
Supply and Total Consumption of Electricity, TWh

	Hydro power	Wind power	Nuclear power	Condensing power [1]	CHP industry	CHP district heat	Net imports	**Total consumption**
1970	9.4	–	–	5.9	4.9	1.0	0.5	**21.8**
1975	12.1	–	–	6.3	4.8	2.1	4.0	**29.2**
1980	10.1	–	6.6	11.1	6.6	4.2	1.2	**39.9**
1985	12.2	–	18.0	4.9	6.4	5.9	4.7	**52.0**
1986	12.3	0.00	18.0	4.1	6.3	6.2	5.8	**52.7**
1987	13.7	0.00	18.5	5.1	6.8	6.8	5.6	**56.4**
1988	13.2	0.00	18.4	5.4	7.1	7.1	7.4	**58.7**
1989	12.9	0.00	18.0	5.1	7.5	7.7	8.9	**60.0**
1990	10.8	0.00	18.1	6.6	7.7	8.5	10.7	**62.3**
1991	13.1	0.00	18.4	7.0	7.3	9.3	7.2	**62.3**
1992	15.0	0.00	18.2	4.6	7.7	9.5	8.2	**63.2**
1993	13.3	0.00	18.8	7.4	8.7	9.8	7.5	**65.5**
1994	11.7	0.01	18.3	12.0	9.5	10.7	6.1	**68.3**
1995	12.8	0.01	18.1	8.9	9.5	11.3	8.4	**68.9**
1996	11.7	0.01	18.7	13.8	9.7	12.5	3.7	**70.0**
1997	11.8	0.02	20.1	10.9	10.9	12.3	7.7	**73.6**
1998	14.8	0.02	21.0	6.3	12.0	13.2	9.3	**76.6**
1999	12.5	0.05	22.1	7.2	12.0	12.8	11.1	**77.8**
2000	14.5	0.08	21.6	6.7	11.7	12.7	11.9	**79.2**
2001	13.0	0.07	21.9	10.6	11.6	14.1	10.0	**81.2**
2002	10.6	0.06	21.4	12.4	12.3	14.9	11.9	**83.5**
2003	9.5	0.09	21.8	21.0	12.7	15.3	4.9	**85.2**
Share								
2003	11%	0.1%	26%	25%	15%	18%	6%	**100%**
Annual change								
03/02	–11%	46%	2%	70%	4%	3%	–59%	**2%**

[1] Condensing power includes conventional condensing power, peak gas turbine power and gas engines.

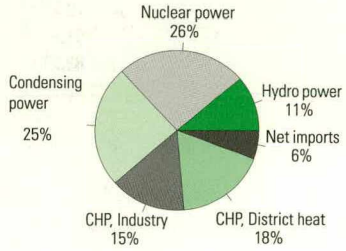
Source: Adato Energia Oy.

Electricity Supply 1970–2003

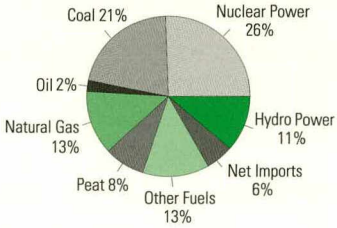


Electricity Supply 2003

By Mode of Production



By Source



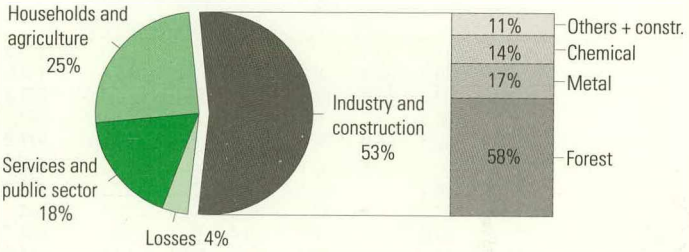
Total electricity supply in 2003 was 85.2 TWh.

Electricity Consumption by Sector, TWh

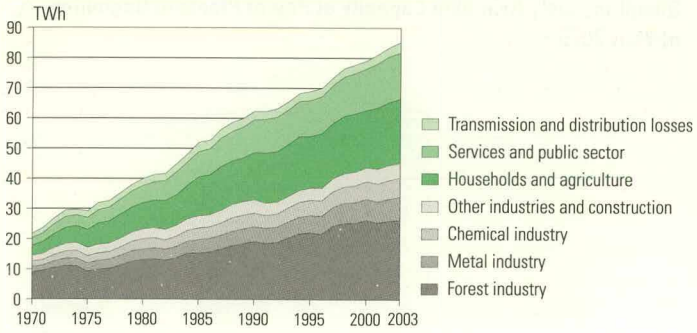
	Industry and construction					Households and agriculture	Services and public sector	Transm. and distrib. losses	**Total**
	Total	Forest	Metal	Chemical	Others + construction				
1970	14.5	9.0	1.8	1.8	1.9	3.3	2.5	1.5	**21.8**
1975	17.1	9.2	2.7	2.4	2.7	6.0	3.9	2.2	**29.2**
1980	23.3	13.0	3.6	3.4	3.3	8.6	5.7	2.3	**39.9**
1985	27.7	15.4	4.4	3.8	4.1	12.8	8.4	3.1	**52.0**
1986	28.0	15.7	4.5	3.8	4.0	13.2	8.6	2.8	**52.7**
1987	29.5	16.6	4.6	4.1	4.3	14.5	9.4	3.0	**56.4**
1988	31.5	17.8	4.7	4.5	4.4	14.4	9.8	3.0	**58.7**
1989	32.4	18.4	4.9	4.6	4.5	14.5	10.2	2.9	**60.0**
1990	33.1	19.1	5.0	4.5	4.5	15.6	10.8	2.8	**62.3**
1991	31.9	18.6	4.9	4.2	4.1	16.5	11.2	2.6	**62.3**
1992	32.3	18.8	5.1	4.4	4.0	16.7	11.4	2.8	**63.2**
1993	34.2	20.5	5.3	4.6	3.8	17.2	11.5	2.7	**65.5**
1994	36.1	21.7	5.5	4.9	3.9	17.8	11.7	2.6	**68.2**
1995	37.0	22.2	5.7	5.0	4.1	17.1	11.9	3.0	**68.9**
1996	36.9	21.7	6.0	5.1	4.2	18.0	12.4	2.7	**70.0**
1997	40.2	24.4	6.2	5.2	4.4	18.2	12.6	2.5	**73.6**
1998	41.8	25.3	6.7	5.4	4.4	19.0	13.1	2.8	**76.6**
1999	42.3	25.4	6.8	5.6	4.5	19.3	13.4	2.8	**77.8**
2000	43.7	26.3	7.0	5.9	4.6	19.0	13.8	2.6	**79.2**
2001	43.3	25.4	7.0	5.9	4.9	20.2	14.7	2.9	**81.2**
2002	44.6	26.1	7.2	6.2	5.1	20.8	15.2	2.9	**83.5**
2003	45.2	26.3	7.7	6.3	4.9	21.3	15.3	3.4	**85.2**
Share									
2003	53%	31%	9%	7%	6%	25%	18%	4%	**100%**
Annual Change									
03/02	1%	1%	7%	2%	–3%	2%	0%	17%	**2%**

Sources: Adato Energia Oy; Fortum Power and Heat Oy;
Statistics on the Structure of Industry/Statistics Finland.

Electricity Consumption by Sector 2003



Electricity Consumption by Sector 1970–2003



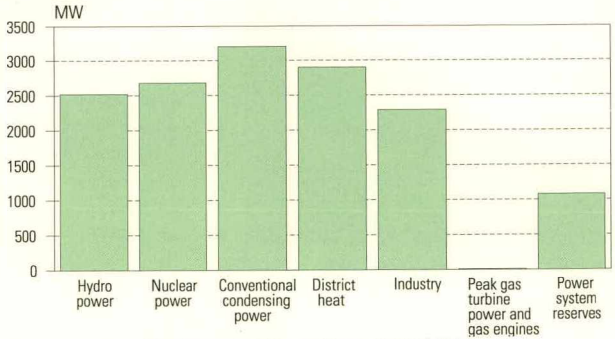
Energy Sources in Electricity Generation, PJ

	Hydro power	Nuclear energy	Hard coal	Oil	Natural gas	Peat	Other fuels	Net imports of electr.	**Total**
1970	33.9	–	41.8	32.1	–	..	17.9	1.9	**127.6**
1975	43.5	–	40.2	38.2	8.9	..	14.6	14.4	**159.8**
1980	36.4	72.3	102.7	26.8	12.6	..	29.2	4.4	**284.4**
1985	44.0	196.1	60.9	7.7	9.7	8.9	22.7	17.0	**367.2**
1990	38.7	197.8	61.3	9.7	24.8	17.2	29.1	38.7	**417.3**
1995	46.1	197.8	65.0	7.5	37.1	36.3	36.6	30.3	**456.6**
1996	42.2	203.8	106.1	8.7	40.4	40.8	38.1	13.2	**493.2**
1997	42.5	218.7	90.3	6.8	33.2	36.6	44.6	27.6	**500.2**
1999	45.3	240.7	57.0	8.1	38.3	28.4	50.7	40.0	**508.7**
2000	52.3	235.4	60.2	7.5	41.3	21.7	53.7	42.8	**514.9**
2001	47.1	238.4	77.4	6.6	48.2	41.1	56.6	35.9	**551.4**
2002	38.5	233.4	93.6	7.0	48.1	41.6	62.1	42.9	**567.2**
2003	34.4	238.1	156.5	12.1	59.5	52.7	64.1	17.5	**634.8**

Source: Adato Energia Oy.

Electricity generation capacities in peak load period

Simultaneously Available Capacity of Power Plants at Beginning of Year 2005



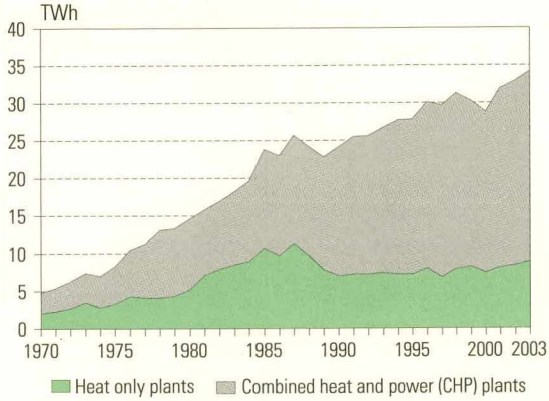
Total capacity of Power Plants 13 600 MW

Production and Consumption of District Heat, TWh

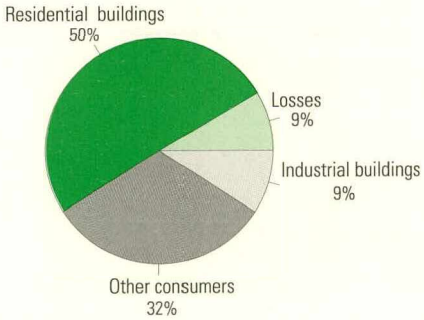
	Net production of district heat			Network and measuring losses	Consumption of district heat			
	Heat only plants	CHP plants	**Total**		Residential buildings	Industrial buildings	Other consumers	**Total**
1970	2.0	2.8	**4.8**	0.3	..	0.6	..	**4.5**
1975	3.3	5.0	**8.2**	0.6	4.7	0.9	2.0	**7.7**
1980	5.2	9.4	**14.6**	1.3	7.8	1.4	4.1	**13.3**
1981	7.1	8.7	**15.7**	1.5	8.5	1.4	4.4	**14.3**
1982	7.9	9.0	**16.9**	1.8	9.2	1.4	4.5	**15.1**
1983	8.5	9.7	**18.2**	2.0	9.6	1.5	5.1	**16.2**
1984	8.9	10.7	**19.6**	2.1	10.3	1.6	5.5	**17.5**
1985	10.7	13.1	**23.8**	2.2	12.6	2.1	7.0	**21.7**
1986	9.7	13.3	**23.0**	2.0	12.1	1.9	6.9	**21.0**
1987	11.3	14.4	**25.7**	2.1	13.5	2.2	7.8	**23.6**
1988	9.7	14.5	**24.2**	2.0	12.8	2.1	7.4	**22.2**
1989	7.8	15.0	**22.8**	2.0	11.9	1.9	7.0	**20.9**
1990	7.0	17.1	**24.1**	1.9	12.5	2.0	7.7	**22.3**
1991	7.2	18.3	**25.5**	2.0	13.0	2.1	8.4	**23.5**
1992	7.2	18.4	**25.6**	2.0	13.1	2.1	8.4	**23.6**
1993	7.4	19.3	**26.7**	2.0	13.9	2.3	8.5	**24.6**
1994	7.2	20.5	**27.6**	2.3	14.0	2.4	8.9	**25.3**
1995	7.2	20.6	**27.8**	2.4	14.3	2.7	8.4	**25.4**
1996	8.0	22.1	**30.0**	2.5	15.3	2.9	9.4	**27.6**
1997	6.8	22.9	**29.7**	2.6	15.1	2.9	9.1	**27.1**
1998	7.9	23.4	**31.3**	2.7	15.6	3.0	9.9	**28.5**
1999	8.2	22.1	**30.4**	2.6	15.4	3.0	9.5	**27.8**
2000	7.4	21.4	**28.8**	2.5	14.9	2.6	8.8	**26.3**
2001	8.1	23.8	**31.8**	2.7	16.2	2.9	10.1	**29.1**
2002	8.4	24.5	**32.9**	2.9	16.6	3.0	10.4	**30.0**
2003	8.9	25.3	**34.1**	3.0	17.4	3.0	10.9	**31.2**

Sources: Finnish District Heating Association and since 1995 also Association of Finnish Local and Regional Authorities.

Production of District Heat 1970–2003

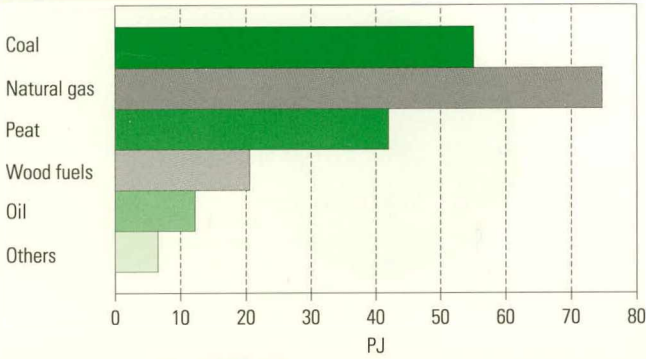


District Heat Use 2003



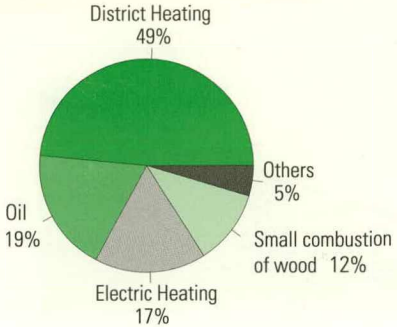
District heat use in 2003 was 34,1 TWh.

Fuel Consumption in Production of District Heat and Combined Production of District Heat and Electricity 2003



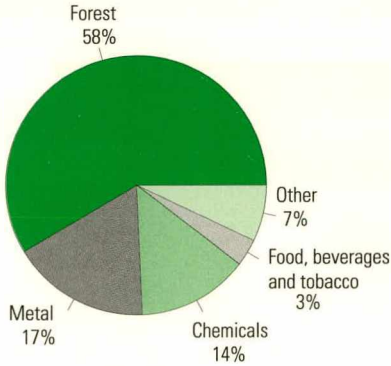
Total fuel consumption in production of district heat and combined production of district heat and electricity in 2003 was 211 PJ (58,6 TWh).

Heating of Residential, Commercial and Public Buildings 2003



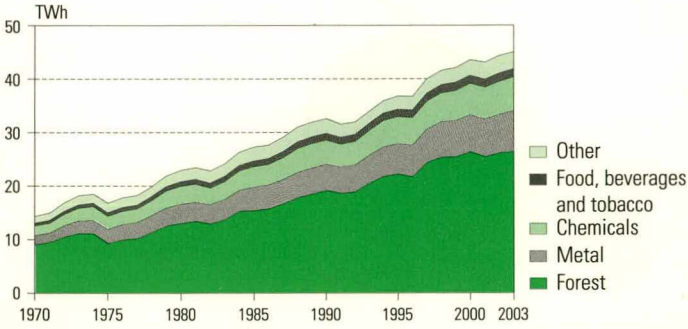
Total heating energy was 58.0 TWh. Heating energy for buildings is calculated by subtracting boiler losses from fuels according to their default efficiences (see page 38).

Electricity Consumption by Branch of Industry 2003

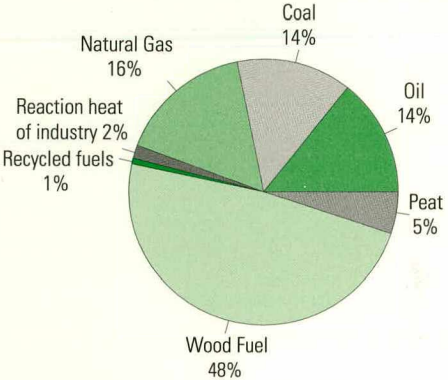


Total electricity consumption by industry in 2003 was 45.0 TWh.

Electricity Consumption by Branch of Industry 1970–2003

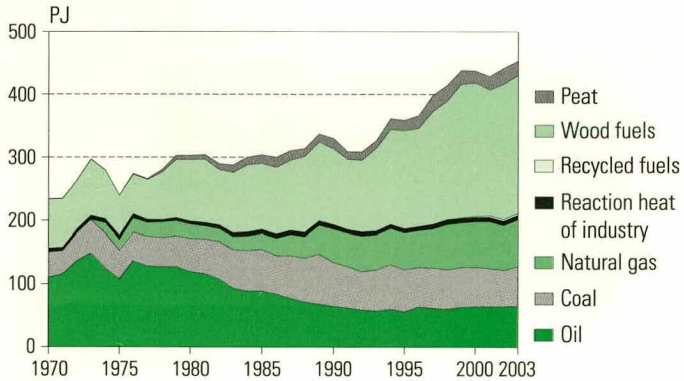


Fuel Consumption in Industry 2003



Total fuel consumption in industry in 2003 was 453 PJ.

Fuel Consumption in Industry 1970–2003

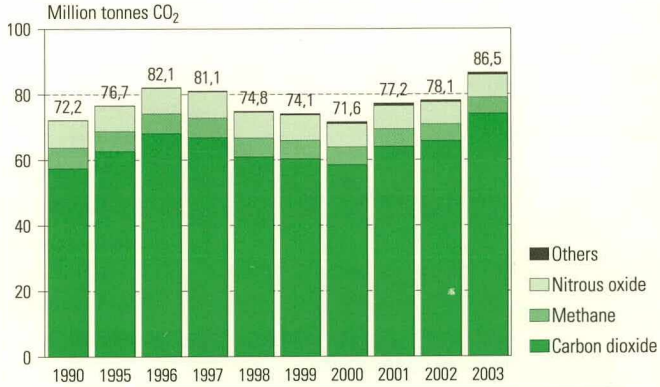


Greenhouse Gas Emissions 1990 and 2003 (1 000 tonnes)

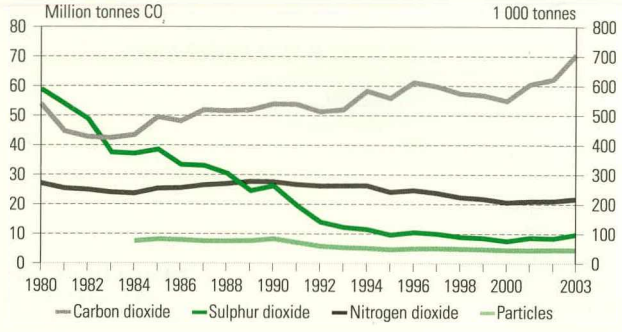
The Gases Included in the Kyoto Protocol

	Carbon dioxide (CO_2)		Methane (CH_4)		Nitrous oxide (N_2O)		Others (HFC, PFC, SF_6)	
	1990	2003	1990	2003	1990	2003	1990	2003
Fuel combustion	53 900	70 500	19	23	4	6	–	–
Fugitive emissions from fuels	3 500	3 600	1	3	–	–	–	–
Industrial processes	1 200	1 300	0	1	5	5	0.004	0.3
Agriculture	3 200	2 900	98	83	16	12	–	–
Waste	–	–	182	125	0	0	–	–
Others	600	800	–	–	0	0	–	–
Total	57 400	74 000	302	235	25	22	0.004	0.3
Emissions, million tonnes of CO_2 equivalent	57.4	74.0	6.3	4.9	7.9	7.0	0.07	0.6

Greenhouse Gas Emissions 1990 and 1995–2003

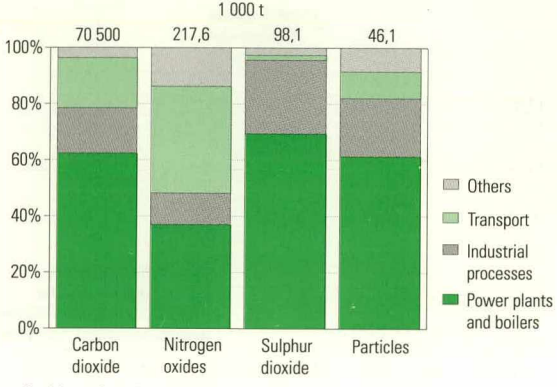


Emissions from Energy Production and Consumption 1980–2003



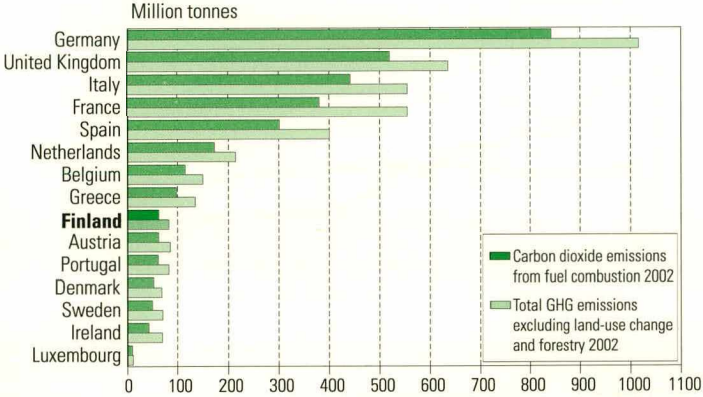
Sulphur dioxide and particles include also emissions from processes. The left-hand side scale is for carbon dioxide.

Air Emissions by Sector 2003

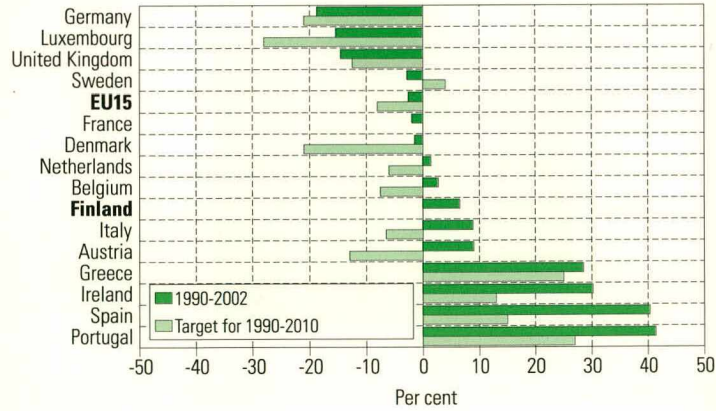


Sulphur dioxide and particles include also emissions from processes.

Greenhouse gas and carbon dioxide emissions from fuel combustion in EU countries



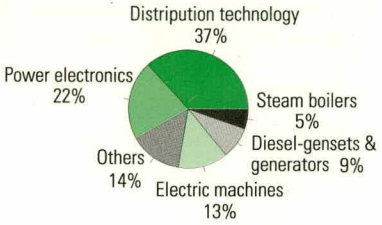
Change in actual GHG emissions and the EU Member States' commitments



Imports and Exports of Energy and Energy Technology 2003

	Imports	Exports
Coal	368 € mil. 9 417 000 t	0.4 € mil. 3 000 t
Natural gas	523 € mil. ..	
Crude oil	2 242 € mil. 12 020 000 t	
Other petroleum products	1 039 € mil. 4 541 000 t	1 550 € mil. 5 466 000 t
Nuclear fuel	57 € mil. 74 t	
Electricity	306 € mil. 12 299 GWh	237 € mil. 6 800 GWh
Others	27 € mil.	11 € mil.
Total	**4 562 € mil.**	**1 798 € mil.**
Energy technology total	**2 027 € mil.**	**2 802 € mil.**

Exports of Energy Technology



Energy Imports 2003

		Russia	Denmark	Norway	Sweden	EU25	OECD	Total Amount	Total Value mil. €
Hard coal	1 000 t	5 558	–	242	1	1 710	1 915	**8 921**	**314**
Coke	1 000 t	–	–	–	–	–	0	**496**	**54**
Natural gas	mil. m^3	..	–	–	–	–	–	**..**	**523**
Crude oil	1 000 t	7 807	2 268	1 066	–	2 497	3 492	**12 020**	**2 242**
Motor gasoline	mil. l	35	–	370	11	15	508	**555**	**114**
Middle distillates	1 000 t	1 343	123	31	241	461	611	**2 082**	**472**
Heavy fuel oil	1 000 t	197	270	137	258	643	780	**983**	**162**
LPG	1 000 t	33	0	50	10	47	97	**233**	**56**
Other petroleum prod.	1 000 t	491	1	27	39	156	215	**721**	**203**
Methanol	1 000 t	148	–	–	0	0	0	**148**	**27**
MTBE	1 000 t	91	–	–	5	15	15	**106**	**33**
Peat	1 000 t	1	0	–	0	2	1	**3**	**0**
Nuclear fuel	t	19	–	–	7	55	55	**74**	**57**
Electricity	GWh	11 397	–	76	826	826	902	**12 299**	**306**
Value	mil. €	2 917	511	378	186	950	1 350		**4 562**

Import of wood fuels is excluded.

Source: Board of Customs/Foreign Trade Statistics.

In addition, energy technology imports totalled € 2 027 million in 2003.

Source: Etlatieto Oy.

Energy Exports 2003

		Sweden	Germany	United States	United Kingdom	EU25	OECD	Total Amount	Total Value mil. €
Coke	1 000 t	0	–	–	–	0	3	**3**	**0**
Motor gasoline	mil. l	853	629	1 151	227	1 908	1 507	**3 415**	**697**
Jet fuel	1 000 t	43	–	–	–	43	0	**43**	**11**
Middle distillates	1 000 t	806	580	–	526	2 243	0	**2 243**	**585**
Heavy fuel oil	1 000 t	11	–	–	–	23	0	**23**	**3**
LPG	1 000 t	4	–	–	–	4	0	**4**	**2**
Other petroleum prod.	1 000 t	156	3	0	18	511	16	**592**	**252**
Peat	1 000 t	93	10	1	8	150	9	**164**	**11**
Electricity	GWh	6 797	–	–	–	6 797	0	**6 800**	**237**
Value	mil. €	672	261	239	198	1 393	319		**1 798**

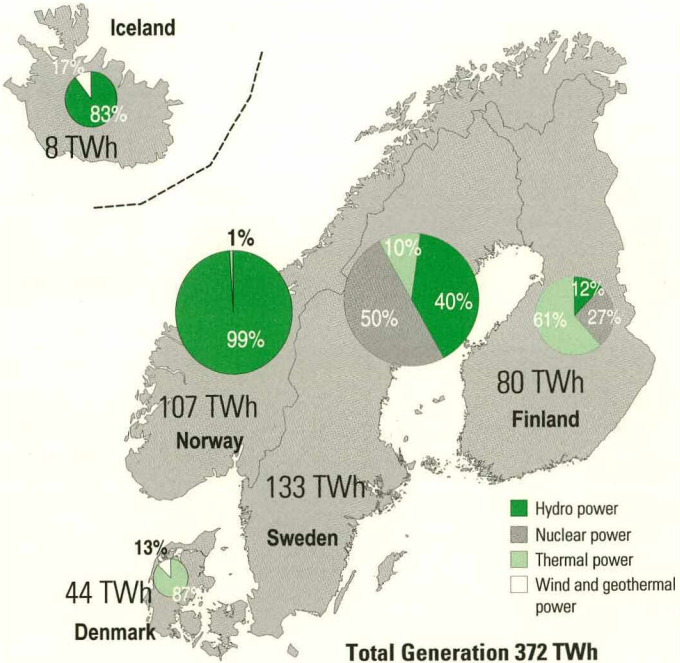
Export of wood fuels is excluded.

Source: Board of Customs/Foreign Trade Statistics.

In addition, energy technology exports totalled € 2 027 million in 2003.

Source: Etlatieto Oy.

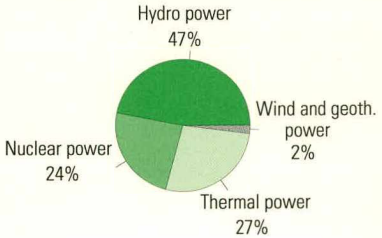
Electricity Generation in Nordic Countries 2003



Electricity Consumption in Nordic Countries 2003, TWh

Iceland	8
Norway	115
Sweden	146
Finland	85
Denmark	36
Total	**390**

Source: Nordel Annual Report 2003.



Spot Prices of the Nordic Power Exchange NordPool by Price Area, € /MWh

Year	Month	Oslo	Stock-holm	Helsinki	Odense	Copen-hagen	System	Volume (GWh)
1998	1–12	13.73	13.54	13.78	–	–	13.78	57 240
1999	1–12	13.10	13.58	13.65	–	–	13.46	75 373
2000	1–12	12.06	14.24	14.88	16.41	–	12.75	95 687
2001	1–12	23.08	22.86	22.83	23.74	23.54	23.15	110 589
2002	1–12	26.57	27.62	27.28	25.47	28.59	26.91	123 622
2003	1–12	37.11	36.49	35.30	33.68	36.80	36.69	117 899
2003	3	40.52	38.50	37.57	34.80	38.49	39.51	11 754
	4	32.74	30.10	29.61	27.52	30.10	31.53	9 878
	5	29.71	29.46	28.06	28.50	29.46	29.51	8 865
	6	24.01	26.67	26.16	26.75	26.67	24.81	7 358
	7	27.50	28.16	28.14	32.92	28.82	27.65	7 280
	8	33.24	33.31	31.25	35.89	34.61	33.01	7 688
	9	32.46	32.75	29.93	34.60	32.75	32.31	7 927
	10	35.09	35.76	33.70	33.47	36.88	35.12	10 383
	11	36.77	35.69	33.87	32.13	36.18	36.26	10 386
	12	32.35	29.42	28.93	26.70	29.13	31.07	11 285
2004	1	29.22	28.80	28.53	26.53	29.29	29.03	17 910
	2	27.67	27.33	27.03	26.01	27.65	27.50	15.981
	3	29.81	28.56	27.28	27.92	28.58	29.19	15 481
	4	29.94	26.54	25.81	27.35	26.49	28.76	12 955
	5	28.13	27.08	26.74	29.31	27.09	27.89	12 583
	6	32.28	31.76	31.10	32.76	32.23	32.02	11 482
	7	29.89	25.94	25.93	30.07	26.13	28.15	11 574
	8	32.86	2.523	31.67	33.99	33.59	32.64	11 667
	9	29.22	28.40	28.08	30.72	28.40	28.96	11 779
	10	27.90	26.37	26.37	27.09	26.37	27.75	13 798

Sources: Nordel and EL-EX NordPool.

Total Consumption of Energy in OECD Countries, PJ

	1973	1980	1990	1999	2000	2001	2002
Australia	2 410	2 950	3 670	4 500	4 600	4 540	4 720
Austria	910	980	1 060	1 210	1 200	1 290	1 270
Belgium	1 940	1 930	2 040	2 480	2 480	2 470	2 380
Canada	6 690	8 080	8 750	10 230	10 510	10 390	10 470
Czech Rep.	1 900	1 980	1 980	1 600	1 690	1 730	1 750
Denmark	830	830	740	840	810	840	830
Finland	890	1 060	1 220	1 400	1 380	1 420	1 490
France	7 730	8 100	9 520	10 680	10 780	11 150	11 130
Germany	14 150	15 090	14 910	14 300	14 380	14 790	14 500
Greece	520	660	930	1 110	1 160	1 200	1 220
Hungary	890	1 190	1 200	1 060	1 050	1 070	1 070
Iceland	50	60	90	130	140	140	140
Ireland	300	360	440	580	600	630	640
Italy	5 400	5 820	6 390	7 140	7 190	7 230	7 230
Japan	13 550	14 510	18 670	21 590	21 840	21 650	21 640
Luxembourg	190	150	150	150	150	160	170
Mexico	2 230	4 070	5 190	6 280	6 300	6 370	6 590
Netherlands	2 610	2 720	2 780	3 080	3 160	3 240	3 260
New Zeeland	350	390	580	720	760	760	750
Norway	610	780	900	1 120	1 080	1 110	1 110
Poland	3 900	5 150	4 180	3 920	3 750	3 770	3 730
Portugal	300	430	740	1 020	1 060	1 060	1 100
Rep. of Korea	910	1 730	3 880	7 490	7 990	8 120	8 520
Slovakia	650	860	900	730	730	770	780
Spain	2 190	2 870	3 820	4 960	5 200	5 350	5 510
Sweden	1 650	1 670	1 950	2 110	1 990	2 140	2 140
Switzerland	830	870	1 050	1 120	1 110	1 170	1 140
Turkey	1 020	1 320	2 220	2 970	3 240	3 000	3 160
United Kingdom	9 240	8 430	8 880	9 700	9 680	9 810	9 480
United States	72 700	75 850	80 710	94 110	96 410	94 370	95 890
EU 15	**48 850**	**51 100**	**55 570**	**60 730**	**61 250**	**62 800**	**62 360**
OECD Total	**157 530**	**170 890**	**189 540**	**218 290**	**222 430**	**221 740**	**223 810**

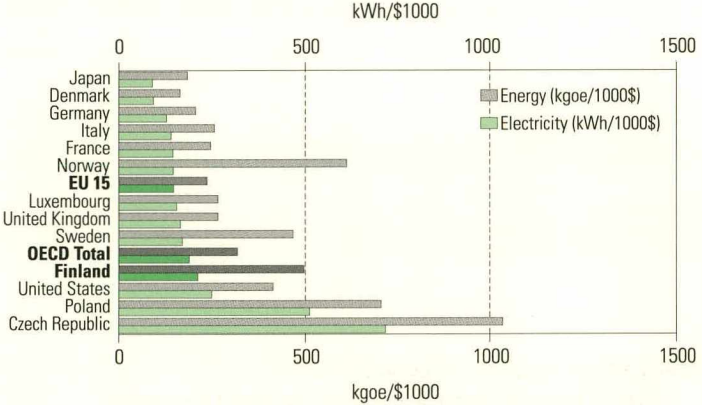
Source: Energy Balances of OECD Countries 2001–2002, IEA/OECD.

Electricity Consumption in OECD Countries, TWh

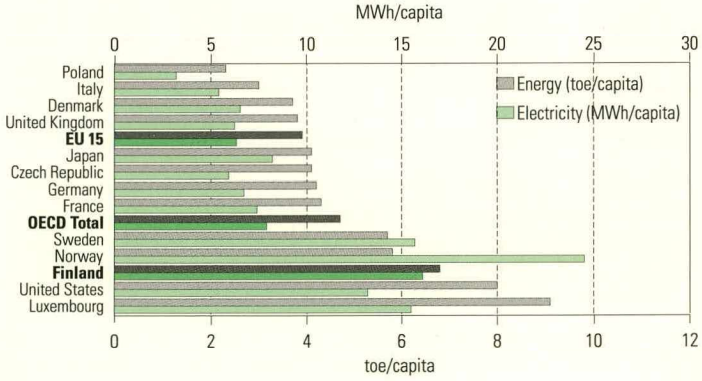
	1973	1980	1990	1999	2000	2001	2002
Australia	52.5	82.1	134.3	175.5	179.9	188.0	193.6
Austria	25.9	33.7	44.0	50.9	53.6	57.4	56.1
Belgium	35.8	44.9	59.1	76.1	79.2	79.8	80.4
Canada	223.2	307.5	431.0	487.1	503.4	501.0	512.7
Czech Rep.	34.1	43.1	53.0	51.2	52.3	53.8	53.7
Denmark	16.1	22.0	29.5	32.6	33.0	33.6	33.0
Finland	27.2	37.6	59.5	75.0	76.4	78.1	80.6
France	160.0	231.7	323.3	401.0	410.7	421.3	419.3
Germany	337.6	419.2	481.0	488.4	505.4	516.9	514.2
Greece	13.0	20.3	29.7	42.3	45.0	46.4	48.5
Hungary	18.6	26.9	33.0	31.1	30.9	32.2	33.3
Iceland	2.1	2.9	3.9	6.5	7.1	7.4	7.7
Ireland	6.2	8.7	12.0	18.9	20.3	21.0	21.9
Italy	125.8	163.6	218.8	267.3	279.3	285.5	291.0
Japan	421.7	520.2	765.1	953.5	949.8	929.4	995.1
Luxembourg	3.0	3.6	4.1	5.5	5.7	5.6	5.7
Mexico	31.6	57.2	100.2	155.6	166.4	168.9	173.0
Netherlands	46.1	58.9	75.5	97.6	100.8	103.0	104.1
New Zeeland	15.9	19.5	27.8	32.4	33.8	34.3	34.9
Norway	61.0	75.1	97.4	109.0	110.5	113.3	109.1
Poland	69.0	99.7	112.5	107.0	108.8	109.1	107.9
Portugal	8.3	14.6	24.0	36.7	38.9	40.5	42.1
Rep. of Korea	12.8	32.7	94.4	241.8	233.5	250.4	295.8
Slovakia	..	..	..	22.7	22.5	24.3	24.4
Spain	60.7	92.0	129.2	181.7	194.7	207.3	212.9
Sweden	69.4	86.1	130.7	128.7	131.1	135.0	133.5
Switzerland	29.0	35.3	47.0	52.1	52.4	54.0	53.8
Turkey	10.4	20.4	46.8	91.2	98.3	97.1	102.9
United Kingdom	242.5	243.3	284.4	329.9	340.4	343.4	343.8
United States	1 715.9	2 099.8	2 712.6	3 430.1	3 589.6	3 434.1	3 609.9
EU 15	**1 177.7**	**1 480.2**	**1 904.6**	**2 232.7**	**2 314.5**	**2 374.9**	**2 387.2**
OECD Total	**3 875.6**	**4 902.6**	**6 563.7**	**8 179.5**	**8 453.6**	**8 372.1**	**8 695.1**

Sources: Electricity Information 2002, IEA/OECD;
Energy Statistics of OECD Countries 2001–2002, IEA/OECD.

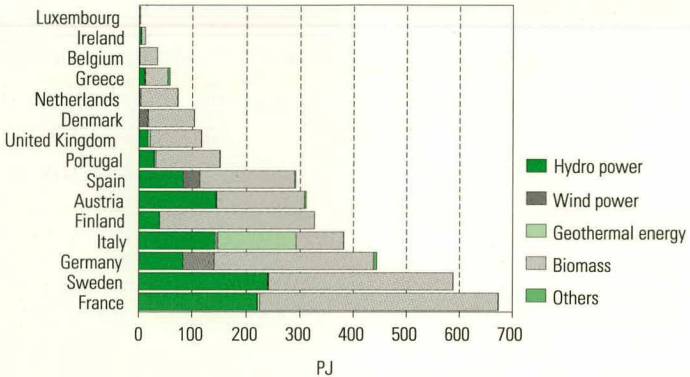
Consumption of Energy and Electricity per GDP-unit in Some OECD Countries 2002



Consumption of Energy and Electricity per Capita in Some OECD Countries 2002

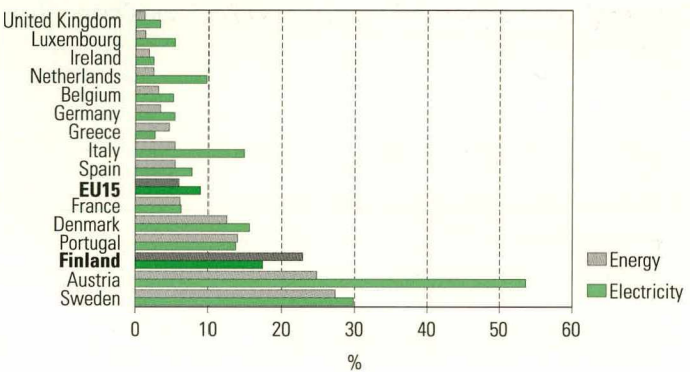


Production of Renewable Energy in EU Countries 2002



Renewable Energy in EU Countries 2002

Share in Primary Energy Supply and Electricity Generation



Includes energy produced from waste.

Source: Energy Balances of OECD Countries 2001–2002, IEA/OECD.

Consumer Prices of Fuel in Some European Countries in December 2003

	Natural gas [1]				Motor gasoline, unleaded	Diesel fuel [2]	Light fuel oil	Heavy fuel oil [3]
	Household		Industry					
	4 652 kWh/a	34 890 kWh/a	11.63 GWh/a	116.30 GWh/a				
	€ /MWh		€ /MWh		c/l	c/l	c/l	c/l
Austria	63	48	33	..	86	72	38	18
Belgium	63	36	23	23	99	72	29	14
Denmark	69	69	23	..	107	82	71	48
Finland	..	..	30	19	104	78	37	23
France	70	37	23	18	99	78	38	17
Germany	69	43	31	..	107	87	35	17
Greece	..	..	..	..	71	63	57	19
Ireland	64	30	..	..	82	75	45	27
Italy	..	..	..	..	103	87	84	21
Luxembourg	44	25	23	14	76	62	30	18
Netherlands	..	..	..	..	113	80	49	24
Norway	..	..	..	..	111	102	61	..
Portugal	62	42	22	13	95	70	43	24
Spain	53	41	18	17	80	69	37	22
Sweden	77	70	34	30	100	84	71	56
United Kingdom	36	24	21	17	109	111	30	21

[1] Price on 1st January.

[2] The considerable fluctuations in diesel oil prices depend on different taxation systems for heavy traffic in different countries.

[3] The price of heavy fuel oil does not include value added tax or sales tax if any.

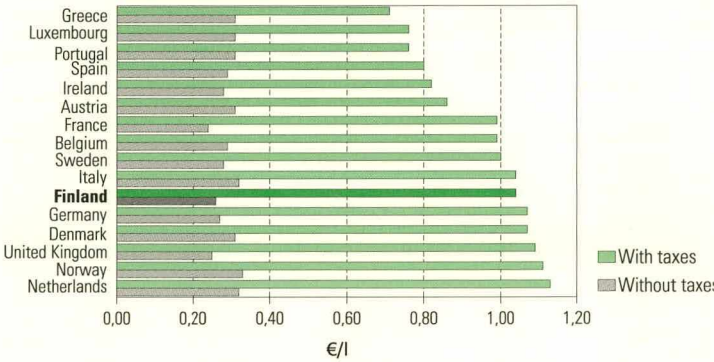
Sources: Finnish Oil and Gas Federation and Energy prices 2003, Eurostat.

Consumer Prices of Electricity in Some European Countries in January 2004, c/kWh

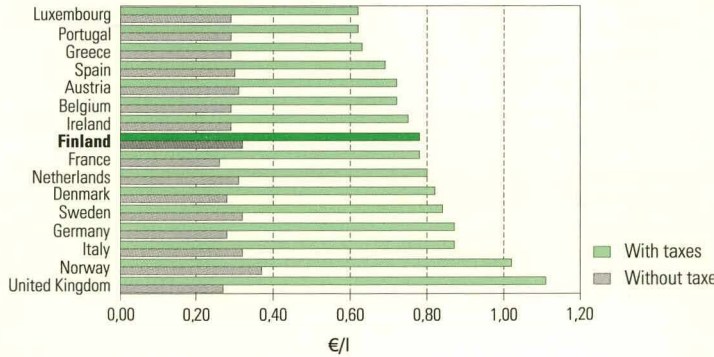
	Household	Industry		
Annual consumption	3 500 kWh	1.25 GWh	10 GWh	24 GWh
Power		0.5 MW	2.5 MW	4 MW
Austria	14.2	9.8	7.5	7.4
Belgium	14.2	10.8	8.6	7.2
Denmark	22.6	11.0	..	..
Finland	10.8	7.8	7.2	6.8
France	11.7	8.1	6.9	6.0
Germany	17.0	11.3	9.6	8.6
Greece	6.7	7.4	6.8	5.7
Ireland	12.6	10.9	8.8	7.8
Italy	19.5	11.8	10.6	9.2
Luxembourg	13.7	9.4	5.2	4.6
Netherlands	18.3	..	..	..
Norway	13.6	7.6	5.7	4.8
Portugal	13.5	7.8	7.2	6.4
Spain	10.8	7.1	6.2	5.9
Sweden	14.4	7.4	6.1	5.6
United Kingdom	9.5	6.7	..	..

Sources: Electricity prices for EU industry on 1 January 2004, Eurostat;
Electricity prices for EU households on 1 January 2004, Eurostat.

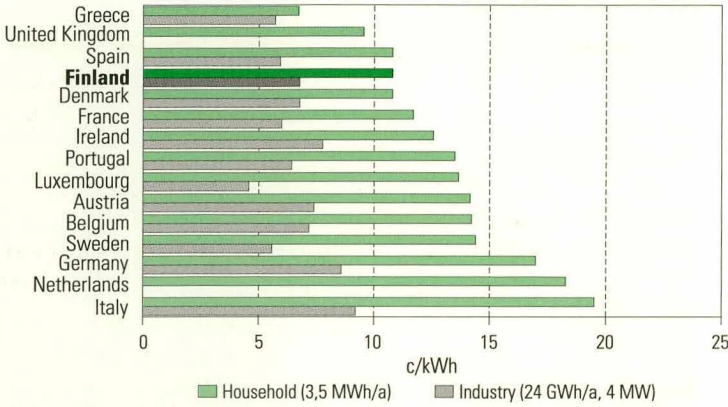
Consumer Prices of Unleaded Petrol in Some European Countries in December 2003



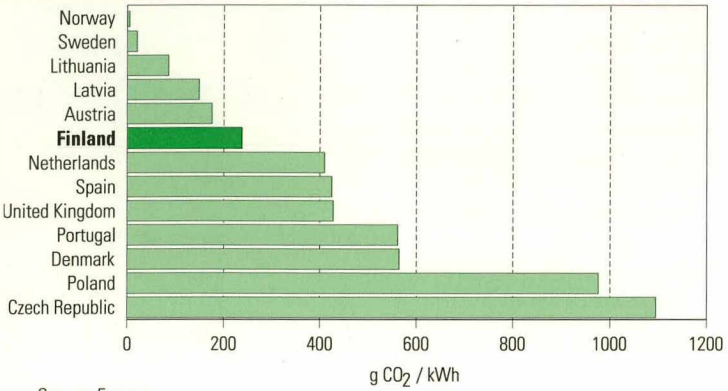
Consumer Prices of Diesel Fuel in Some European Countries in December 2003



Consumer Prices of Electricity in Some European Countries in January 2004



Carbon Dioxide Intensity in Power Generation in Some European Countries 2002



Source: Eurprog

Net Heat Contents and Densities of Energy Sources

Fuels	Unit	Net heat content		Density
		GJ	MWh	t/m^3
Crude oil	t	41.8	11.6	0.86
Heavy fuel oil	t	41.1	11.4	0.98
Light fuel oil	t	42.4	11.8	0.85
Diesel fuel	t	42.8	11.9	0.84
Jet fuel	t	43.3	12.0	0.80
Lamp kerosine	t	43.0	11.9	0.80
Other kerosines	t	43.1	12.0	0.81
Naphtha	t	44.3	12.3	0.70
Motor gasolines	t	43.0	11.9	0.75
Aviation gasolines	t	43.7	12.1	0.71
LPG	t	46.0	12.8	0.51
Refinery gases	t	51.9	14.4	
Hard coal	t	25.5	7.1	
Coke	t	29.3	8.1	
Anthracite	t	33.5	9.3	
Natural gas	1 000 m^3 (0°C)	36.0	10.0	
Blast furnace gas	1 000 m^3	3.8	1.1	
Coke oven gas	1 000 m^3	16.7	4.6	
Town gas	1 000 m^3	15.5	4.3	
Black liquor	t (dry matter)	11.7	3.3	
Sulphite liquors	t (dry matter)	12.0	3.3	
Birch firewood	stacked m^3	5.4	1.5	
Pine and spruce	stacked m^3	4.4	1.2	
Mixed firewood	stacked m^3	4.5	1.3	
Chips	loose m^3	3.3	0.9	
Milled peat	t	10.1	2.8	0.32
Sod peat	t	12.3	3.4	0.38

Conversion Factors between Energy Units

	toe	MWh	GJ	Gcal
toe	1	11.63	41.868	10
MWh	0.086	1	3.6	0.86
GJ	0.02388	0.2778	1	0.2388
Gcal	0.1	1.163	4.1868	1

Example: 1 toe (tonne of oil equivalent) = 11.63 MWh

Prefix

k = kilo	$= 10^3$	= 1 000
M = mega	$= 10^6$	= 1 000 000
G = giga	$= 10^9$	= 1 000 000 000
T = tera	$= 10^{12}$	= 1 000 000 000 000
P = peta	$= 10^{15}$	= 1 000 000 000 000 000

Carbon Dioxide Factors for Some Fuels

	g CO_2 /MJ
Motor gasoline	72.7
Diesel fuel	73.0
Light fuel oil	74.1
Residual fuel oil	77.4
Jet fuel	71.5
LPG	63.1
Other fuels	60–77.4
Hard coal	94.6
Coke	108
Natural gas	56.1
Peat	106
Bark, wood fuel	109.6
Industrial wood residue	109.6
Black liquor	110

Note

Hydro power, wind power and imported electricity have been made commensurate with fuels according to directly obtained electricity (at the efficiency ratio of 100 per cent) and nuclear power at the efficiency ratio of 33 per cent.

Calculation Method for Heating Energy

Net heating energy for buildings is calculated by subtracting boiler losses from fuels according to the following default efficiencies:

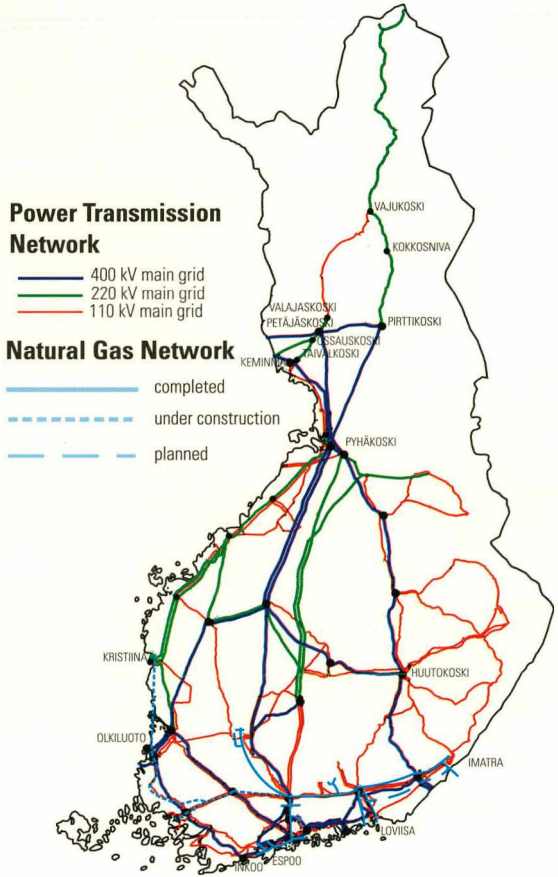
Small combustion of wood	55%
Peat	60%
Coal	60%
Heavy fuel oil	83%
Light fuel oil	78%
Natural gas	90%
District heating	100%
Electric heating	100%

Sources: Technical Research Centre of Finland (VTT) and Tampere University of Technology.

Explanation of Symbols

..	Data not available
–	Magnitude zero
0	Magnitude less than half of unit employed
*	Preliminary
----------	Break in the time series

Power Transmission and Natural Gas Networks 2003



Statistics Finland
Sales Services
P.O.Box 4C
FI-00022 STATISTICS FINLAND
Tel. +358 9 1734 2011
Fax +358 9 1734 2500
myynti@stat.fi

ISSN 0784–9354
= Energy
ISSN 1457–0491
ISBN 952–467–375–4
Product number 9269
E