Statistics Finland

Energy in Finland 2001

Finland in Brief

Area

Situated in northern Europe with an area of 338,145 km^2 of which 68% forest, 10% water, 6% 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°	–5.7°C	+17.0°C
Rovaniemi	66°	–14.5°C	+14.7°C

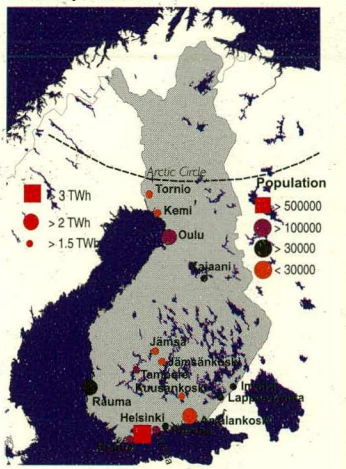
Economy in 2001

GDP totalled € 136 bil., i.e. € 25,414/capita, of which services 63.0%, secondary production 33.6% and primary production 3.4%.

Structure of Industry in 2001, Value Added Gross in Production

	bil. €	%
Total industry	**33.0**	**100**
Mining and quarrying	0.3	1
Forest industry	6.5	20
Chemical industry	2.8	9
Metal industry	3.1	9
Machinery and equipment	3.3	10
Electrical equipment	8.3	25
Other manufacturing ind.	6.5	20
Electricity, gas and water ind.	2.2	7

Municipalities with High Electricity Consumption 2001



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 2001

1,364 PJ (32.6 Mtoe)
262.6 GJ/capita (6.27 toe/capita)

Electricity Consumption in 2001

81.2 TWh
15,628 kWh/capita

Contents

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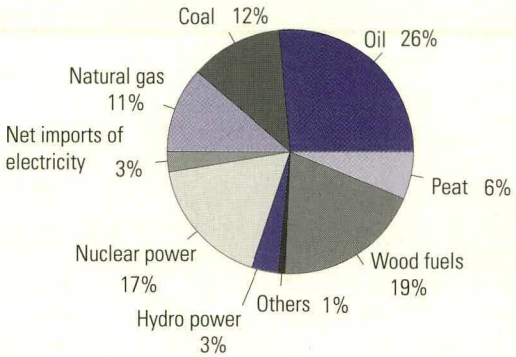
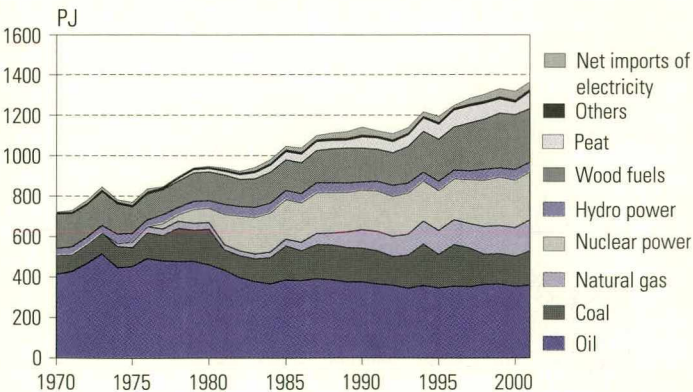
Valopaino Oy, Helsinki 2002

Total Energy Consumption by Energy Source 2001

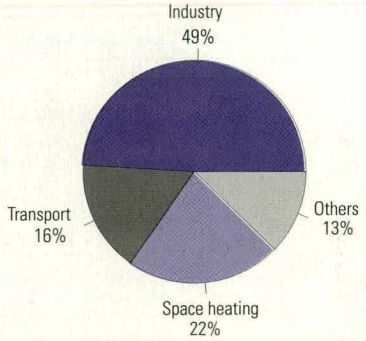


Total energy consumption in 2001 was 1 364 PJ.

Total Energy Consumption by Energy Source 1970–2001

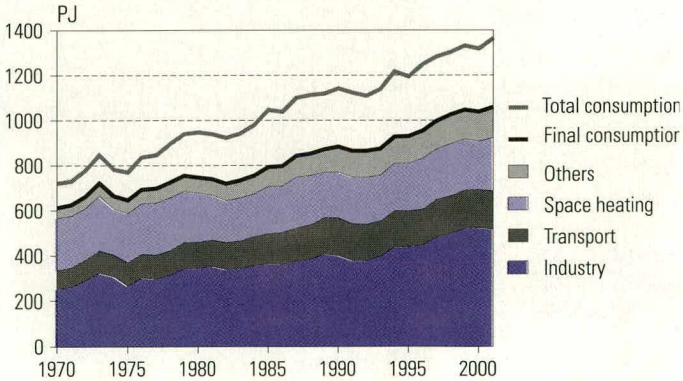


Final Energy Consumption by Sector 2001



Final energy consumption in 2001 was 1 059 PJ.

Total Energy Consumption and Final Energy Consumption by Sector 1970–2001



Total Energy Consumption by Energy Source, PJ

	Oil	Coal	Natural gas	Nuclear power	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	375.5	166.8	90.8	197.8	38.7
1991	365.3	164.0	95.7	200.8	47.0
1992	359.7	141.6	99.3	198.2	53.9
1993	344.4	163.8	102.6	205.1	48.0
1994	358.1	204.7	112.8	199.9	42.0
1995	345.7	166.6	117.2	197.8	46.1
1996	355.0	204.8	122.5	203.8	42.2
1997	352.0	190.8	120.3	218.7	42.5
1998	363.3	148.1	138.0	228.8	53.3
1999	365.1	149.6	138.0	240.7	45.3
2000	352.8	149.0	141.3	235.4	52.3
2001	359.8	168.0	153.1	238.4	47.1
Share					
2001	26.4%	12.3%	11.2%	17.5%	3.5%
Annual change					
01/00	2.0%	12.8%	8.4%	1.3%	–9.9%

Wind power is included in hydro power. Total consumption of wind power in 2001 was 0.251 PJ.

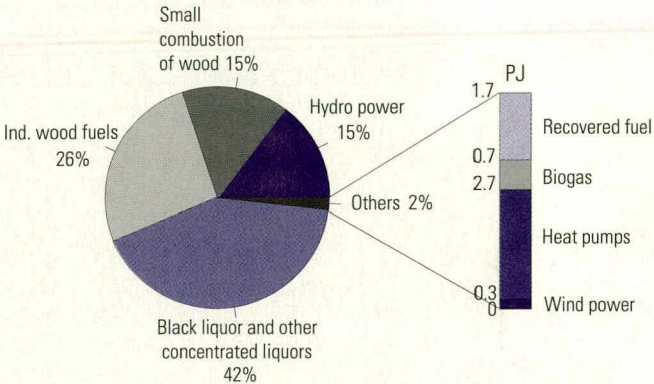
Total Energy Consumption

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	6.1	4.4	**947.0**	1980
145.1	18.8	7.8	8.1	**938.8**	1981
133.7	23.3	8.4	8.3	**922.4**	1982
141.3	30.4	8.7	17.2	**941.8**	1983
153.2	34.7	9.1	18.8	**980.0**	1984
151.3	41.1	9.7	17.0	**1 046.4**	1985
152.5	43.3	9.6	20.9	**1 037.9**	1986
158.4	45.4	9.5	20.1	**1 099.6**	1987
167.7	41.5	10.0	26.6	**1 112.0**	1988
172.0	39.5	10.0	31.9	**1 118.5**	1989
167.2	55.9	9.9	38.7	**1 141.2**	1990
158.6	56.4	9.2	25.9	**1 122.8**	1991
161.2	55.3	9.8	29.6	**1 108.5**	1992
180.5	58.4	8.9	27.1	**1 138.8**	1993
201.8	66.7	9.0	21.9	**1 216.9**	1994
207.5	74.3	9.2	30.3	**1 194.6**	1995
212.8	84.8	9.8	13.2	**1 248.8**	1996
237.2	83.3	10.8	27.6	**1 283.1**	1997
247.9	79.6	10.6	33.5	**1 302.9**	1998
270.4	70.5	11.4	40.0	**1 331.1**	1999
271.0	61.9	11.1	42.8	**1 317.6**	2000
265.4	84.0	12.3	35.9	**1 364.0**	2001
					Share
19.5%	6.2%	0.9%	2.6%	**100%**	2001
				Annual	**change**
–2.0%	35.6%	10.5%	–16.2%	**3.5%**	01/00

Consumption of Renewables, PJ

	Hydro power	Industrial wood fuels	Black liquor and others	Small combustion of wood	Others	**Total**
1970	33.9	20.2	57.7	92.2	..	**204.0**
1975	43.5	14.8	48.3	67.6	..	**174.3**
1980	36.4	31.1	67.4	43.6	0.5	**179.0**
1981	48.7	33.1	68.2	43.7	0.8	**194.5**
1982	46.6	29.4	60.5	43.8	1.1	**181.4**
1983	48.4	30.7	66.6	44.0	1.4	**191.1**
1984	47.2	34.4	74.7	44.0	1.6	**201.9**
1985	44.0	31.6	75.5	44.1	2.0	**197.2**
1986	44.2	31.1	77.2	44.2	1.8	**198.4**
1987	49.2	32.4	81.6	44.4	1.9	**209.5**
1988	47.6	35.0	88.1	44.5	1.7	**217.0**
1989	46.4	36.3	91.1	44.6	1.5	**220.0**
1990	38.7	36.5	86.1	44.7	1.6	**207.5**
1991	47.0	32.9	80.9	44.8	1.8	**207.4**
1992	53.8	32.8	83.5	44.9	1.7	**216.7**
1993	48.0	40.4	95.1	45.0	1.8	**230.3**
1994	42.0	52.4	104.4	45.0	1.9	**245.6**
1995	46.0	53.9	109.0	44.7	3.1	**256.7**
1996	42.1	56.2	109.6	46.9	3.6	**258.6**
1997	42.5	61.6	128.5	47.0	3.7	**283.3**
1998	53.2	64.9	135.4	47.6	3.9	**305.0**
1999	45.2	81.2	142.6	46.6	4.3	**319.9**
2000	52.0	82.2	143.5	45.3	4.5	**327.5**
2001	46.9	83.2	133.7	48.5	5.4	**317.7**

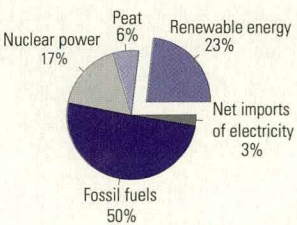
Consumption of Renewables 2001



The total consumption of renewable energy sources in 2001 was 318 PJ which is 23% of total energy consumption.

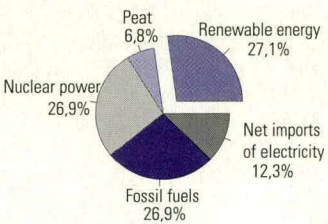
Share of Renewables 2001

In Total Energy Consumption



Total 1 364 PJ

In Electricity Supply



Total 81 TWh

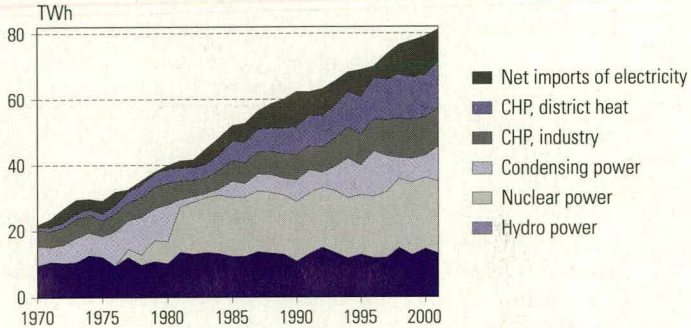
Supply and Total Consumption of Electricity, TWh

	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**
Share								
2001	16.0%	0.1%	26.9%	13.0%	14.3%	17.4%	12.3%	**100%**
Annual change								
01/00	–9.9%	–9.1%	1.3%	56.6%	–1.1%	10.8%	–16.2%	**2.6%**

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

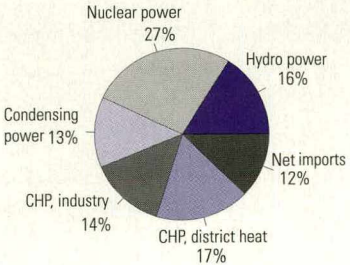
Source: Adato Energia Oy.

Electricity Supply 1970–2001

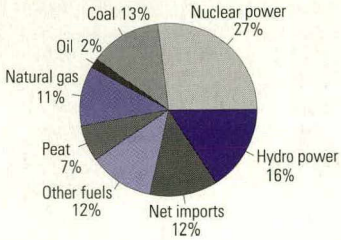


Electricity Supply 2001

By Mode of Production



By Source



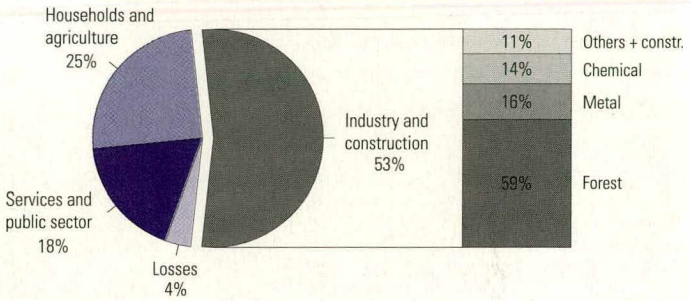
Total electricity supply in 2001 was 81,2 TWh.

Electricity Consumption by Sector, TWh

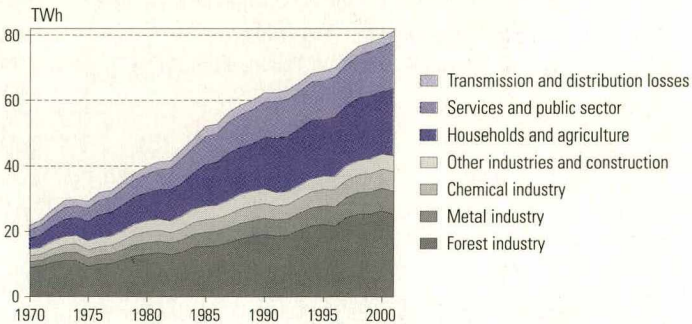
	Industry and construction					Households and agriculture	Services and public sector	Transm. and distrib. losses	**Total**
	Total	Forest	Metal	Chemical	Others + construction				
1970	14.5	9.0	1.8	1.8	1.9	3.3	2.5	1.5	**21.8**
1975	17.1	9.2	2.7	2.4	2.7	6.0	3.9	2.2	**29.2**
1980	23.3	13.0	3.6	3.4	3.3	8.6	5.7	2.3	**39.9**
1985	27.8	15.4	4.4	3.8	4.2	12.8	8.4	3.1	**52.0**
1986	28.1	15.7	4.5	3.8	4.1	13.2	8.6	2.8	**52.7**
1987	29.6	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	4.5	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	32.0	18.6	4.9	4.2	4.2	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	3.9	17.2	11.5	2.7	**65.5**
1994	36.2	21.7	5.5	4.9	3.9	17.8	11.7	2.6	**68.3**
1995	37.0	22.2	5.7	5.0	4.1	17.0	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	43.8	26.3	7.0	5.9	4.6	19.0	13.8	2.6	**79.2**
2001	43.2	25.3	7.1	6.0	4.9	20.2	14.7	3.0	**81.2**
Share									
2001	53.3%	31.2%	8.7%	7.3%	6.0%	24.9%	18.1%	3.7%	**100%**
Annual Change									
01/00	–1.1%	–3.7%	1.3%	1.7%	6.1%	6.7%	6.3%	15.0%	**2.6%**

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

Electricity Consumption by Sector 2001



Electricity Consumption by Sector 1970–2001



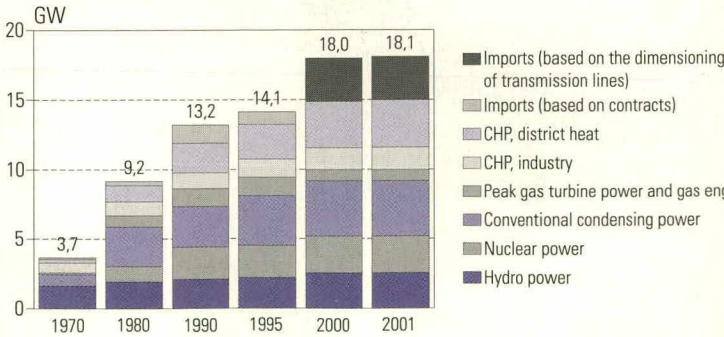
Energy Sources in Electricity Generation, PJ

	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**
1991	47.0	200.8	59.7	6.9	26.4	24.8	28.8	25.9	**420.3**
1992	53.9	198.2	43.9	7.3	25.2	21.8	28.1	29.6	**408.0**
1993	48.0	205.1	62.5	7.3	27.6	26.2	33.9	27.1	**437.8**
1994	42.0	199.9	96.2	8.9	34.1	32.4	36.6	21.9	**472.2**
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**
1998	53.3	228.8	53.0	8.2	37.2	32.9	48.9	33.5	**495.9**
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	80.9	8.4	44.7	40.3	54.1	35.9	**549.6**

Source: Adato Energia Oy.

Capacity of Electricity Supply 1970–2001

Simultaneously Available Capacity of Power Stations at Beginning of Yea

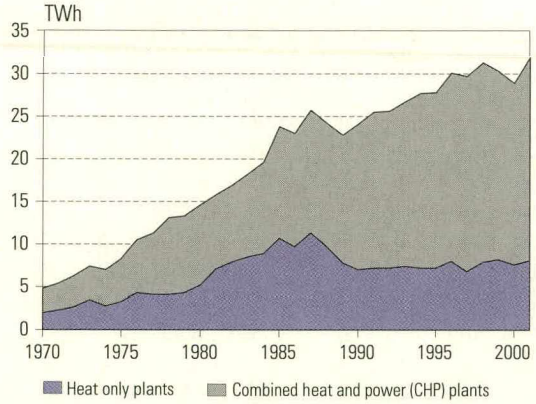


Production and Consumption of District Heat, TWh

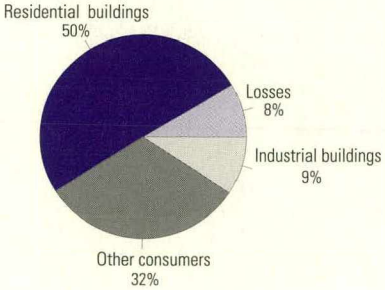
	Net production of district heat			Network and measuring losses	Consumption of district heat			
	Heat only plants	CHP plants	**Total**		Residential buildings	Industrial buildings	Other consumers	**Total**
1970	2.0	2.8	**4.8**	0.3	..	0.6	..	**4.5**
1975	3.3	5.0	**8.2**	0.6	4.7	0.9	2.0	**7.7**
1980	5.2	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	7.6	21.3	**28.9**	2.4	14.8	2.6	9.0	**26.4**
2001	8.1	23.8	**31.8**	2.7	16.1	2.9	10.2	**29.2**

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

Production of District Heat 1970–2001

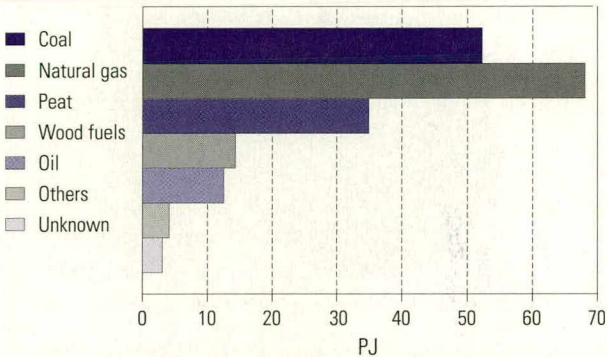


District Heat Use 2001



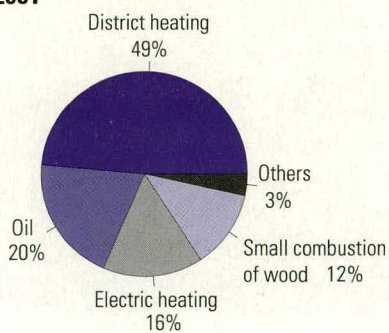
District heat use in 2001 was 31,8 TWh.

Fuel Consumption in Production of District Heat and Combined Production of District Heat and Electricity 2001



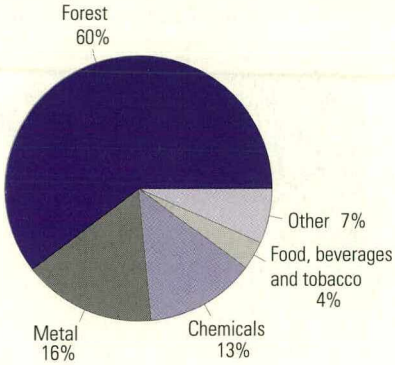
Total fuel consumption in production of district heat and combined production of district heat and electricity in 2001 was 189 PJ (52,5 TWh).

Heating of Residential, Commercial and Public Buildings 2001



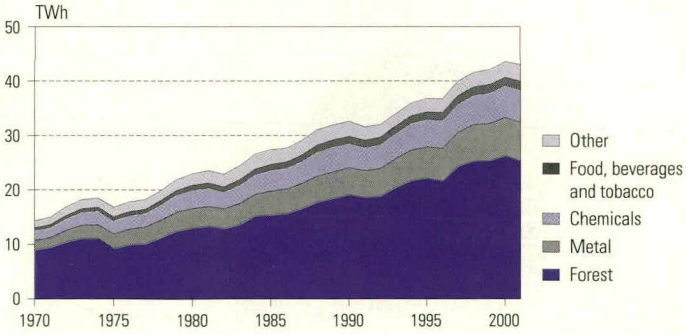
Total heating energy was 53.8 TWh. Heating energy for buildings is calculated by subtracting boiler losses from fuels according to their default efficiences (see page 38).

Electricity Consumption by Branch of Industry 2001

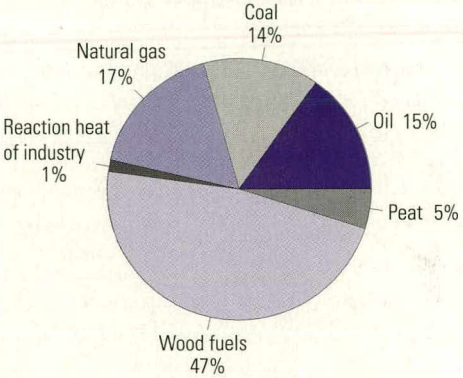


Total electricity consumption by industry in 2001 was 43.0 TWh.

Electricity Consumption by Branch of Industry 1970–2001

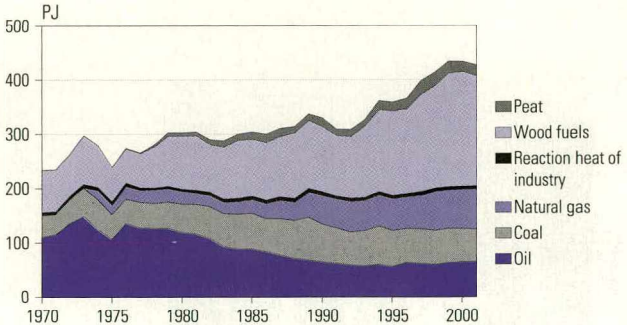


Fuel Consumption in Industry 2001



Total fuel consumption in industry in 2001 was 427 PJ.

Fuel Consumption in Industry 1970–2001

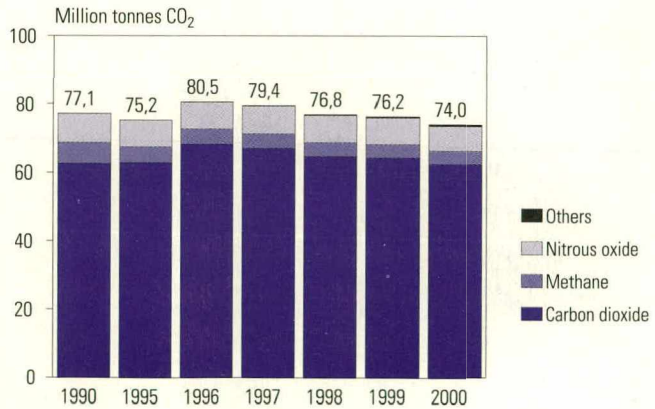


Greenhouse Gas Emissions 1990 and 2000 (1 000 tonnes)

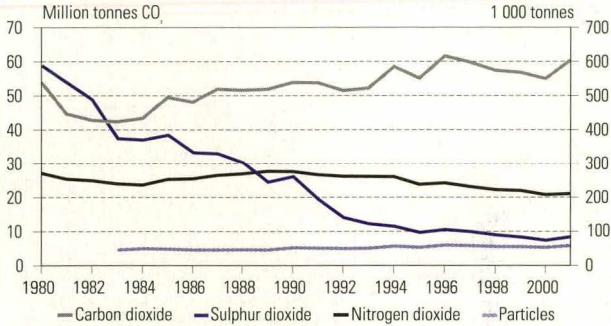
The Gases Included in the Kyoto Protocol

	Carbon dioxide (CO_2)		Methane (CH_4)		Nitrous oxide (N_2O)		Others (HFC, PFC, SF_6)	
	1990	2000	1990	2000	1990	2000	1990	2000
Fuel combustion	53 900	54 900	19	21	6	6	–	–
Fugitive emissions from fuels	3 500	3 500	1	1	–	–	–	–
Industrial processes	1 200	1 100	0	1	5	4	0.003	0.3
Agriculture	3 200	2 000	96	83	16	13	–	–
Waste	–	–	175	80	0	0	–	–
Others	600	700	–	–	0	0	–	–
Total	62 500	62 300	292	187	27	23	0.003	0.3
Emissions, million tonnes of CO_2 equivalent	62.5	62.3	6.1	3.9	8.4	7.2	0.07	0.5

Greenhouse Gas Emissions 1990 and 1995–2000

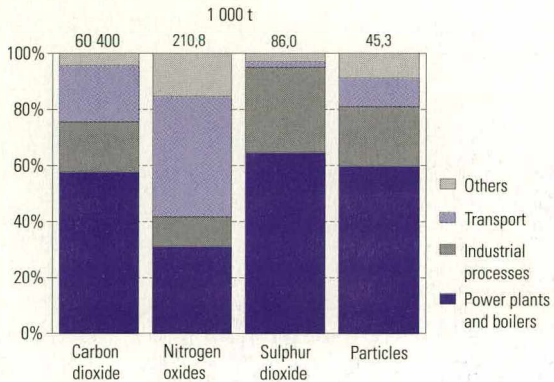


Emissions from Energy Production and Consumption 1980–2001



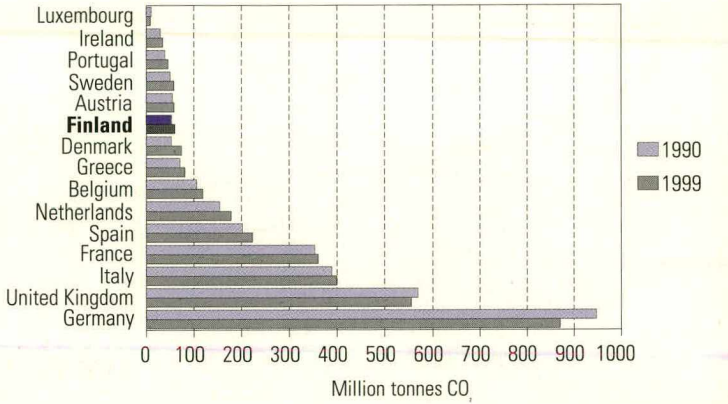
Sulphur dioxide and particles include also emissions from processes. The left-hand side scale is for carbon dioxide.

Air Emissions by Sector 2001*

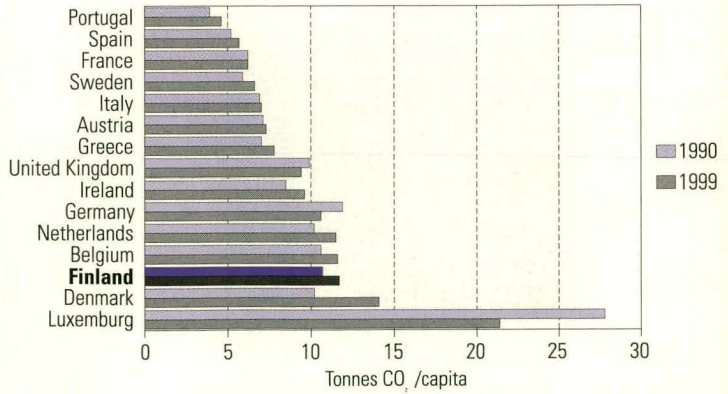


Sulphur dioxide and particles include also emissions from processes.

Carbon Dioxide Emissions in EU Countries in 1990 and 1999



Carbon Dioxide Emissions per Capita in EU Countries 1990 and 1999

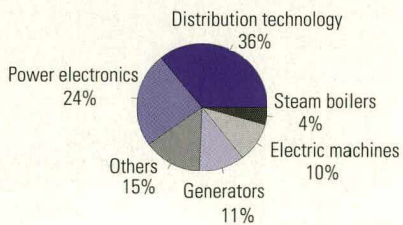


Source: 2000 – Annual Energy Review, European Commission.

Imports and Exports of Energy and Energy Technology 2001

	Imports	Exports
Coal	273 € mil. 5 193 000 t	0.2 € mil. 2 000 t
Natural gas	472 € mil. ..	
Crude oil	2 163 € mil. 10 952 000 t	
Other petroleum products	1 025 € mil. 4 037 000 t	1 449 € mil. 4 827 000 t
Nuclear fuel	50 € mil. 134 t	
Electricity	212 € mil. 11 780 GWh	39 € mil. 1 722 GWh
Others	22 € mil.	11 € mil.
Total	**4 218 € mil.**	**1 499 € mil.**
Energy technology total	**2 414 € mil.**	**3 028 € mil.**

Exports of Energy Technology



Energy Imports 2001

		Russia	Norway	Denmark	United Kingom	EU15	OECD	Total Amount	Total Value mil. €
Hard coal	1 000 t	2 641	263	–	0	1	1 795	**4 710**	**215**
Coke	1 000 t	–	–	–	–	0	77	**483**	**58**
Natural gas	mil. m^3	..	–	–	–	–	–	**..**	**472**
Crude oil	1 000 t	5 116	1 804	2 188	1 048	3 247	5 081	**10 952**	**2 163**
Motor gasoline	mil. l	135	256	–	25	53	309	**484**	**110**
Middle distillates	1 000 t	1 186	5	–	54	248	444	**1 670**	**418**
Heavy fuel oil	1 000 t	184	8	129	–	461	469	**654**	**95**
LPG	1 000 t	90	76	0	16	16	92	**217**	**61**
Other petroleum prod.	1 000 t	636	1	11	25	242	280	**1 039**	**300**
Methanol	1 000 t	126	0	–	0	0	0	**126**	**22**
MTBE	1 000 t	47	0	2	0	47	47	**94**	**42**
Peat	1 000 t	0	0	0	–	0	0	**1**	**0**
Nuclear fuel	t	18	–	–	–	116	116	**134**	**50**
Electricity	GWh	7 692	614	–	–	3 474	4 088	**11 780**	**212**
Value	mil. €	2 272	491	449	254	1 038	1 673		**4 218**

Import of wood fuels is excluded.

Source: Board of Customs/Foreign Trade Statistics.

In addition, energy technology imports totalled € 2 414 million in 2001.

Source: Etlatieto Oy.

Energy Exports 2001

		Sweden	United States	France	United Kingdom	EU15	OECD	Total Amount	Total Value mil. €
Coke	1 000 t	–	–	–	–	0	2	**2**	**0**
Motor gasoline	mil. l	1 067	477	555	528	2 153	763	**2 933**	**636**
Jet fuel	1 000 t	55	–	–	–	76	0	**76**	**21**
Middle distillates	1 000 t	722	359	330	53	1 802	167	**2 054**	**573**
Heavy fuel oil	1 000 t	1	25	26	–	79	0	**79**	**10**
LPG	1 000 t	0	8	–	–	8	0	**8**	**3**
Other petroleum prod.	1 000 t	96	43	13	0	323	24	**410**	**206**
Peat	1 000 t	74	7	0	0	126	9	**140**	**11**
Electricity	GWh	1 701	–	–	–	1 701	0	**1 722**	**39**
Value	mil. €	552	241	205	122	1 193	216		**1 499**

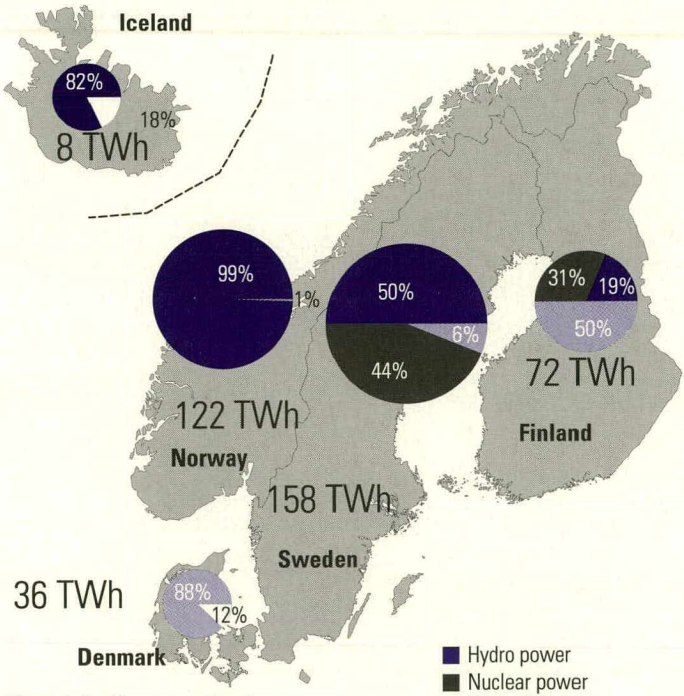
Export of wood fuels is excluded.

Source: Board of Customs/Foreign Trade Statistics.

In addition, energy technology exports totalled € 3 028 million in 2001.

Source: Etlatieto Oy.

Electricity Generation in Nordic Countries 2001



Electricity Consumption in Nordic Countries 2001, TWh

Iceland	8
Norway	125
Sweden	151
Finland	82
Denmark	35

Source: Nordel Annual Report 2001.

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
2001	1	20.47	20.47	20.46	20.64	22.85	20.46	12 982
	2	26.90	27.13	27.13	25.93	27.13	27.06	10 675
	3	25.84	25.80	25.78	24.98	25.80	25.86	10 307
	4	26.55	26.36	26.10	26.03	26.35	26.46	8 665
	5	23.95	21.77	21.77	24.09	21.77	24.07	8 987
	6	25.27	25.23	25.16	26.06	25.50	25.28	6 480
	7	22.34	22.32	22.32	23.17	23.26	22.63	6 236
	8	21.17	21.13	21.14	23.45	21.16	21.36	8 367
	9	21.67	19.35	19.44	23.13	20.60	20.88	7 510
	10	18.83	18.87	18.87	21.63	19.32	19.10	9 976
	11	21.27	21.59	21.59	21.50	22.28	21.41	9 605
	12	23.14	24.72	24.72	24.51	26.89	23.61	10 800
2002	1	24.23	24.89	24.91	23.49	27.14	24.53	13 888
	2	20.25	20.40	20.41	20.12	20.45	20.30	10 052
	3	18.61	18.62	18.62	18.96	18.66	18.60	9 711
	4	17.39	17.39	17.39	22.01	22.39	17.39	8 457
	5	15.05	15.76	15.85	18.06	16.01	15.27	10 090
	6	14.66	19.83	19.93	22.88	20.22	16.43	7 858
	7	14.59	17.00	18.39	19.44	18.98	15.66	9 552
	8	19.43	22.52	22.76	23.61	24.77	20.27	7 686
	9	24.15	25.82	25.81	28.72	26.67	24.65	8 267

Sources: Nordel and EL-EX NordPool.

Total Consumption of Energy in OECD Countries, PJ

	1973	1980	1990	1998	1999	2000
Australia	2 410	2 950	3 670	4 350	4 510	4 610
Austria	910	960	1 060	1 190	1 200	1 200
Belgium	1 940	1 930	2 030	2 440	2 450	2 480
Canada	6 740	8 080	8 750	9 940	10 180	10 510
Czech Republic	1 900	1 980	1 980	1 720	1 600	1 690
Denmark	830	830	760	870	840	810
Finland	890	1 060	1 210	1 400	1 400	1 390
France	7 390	7 860	9 460	10 650	10 680	10 770
Germany	14 150	15 090	14 890	14 430	14 280	14 220
Greece	520	660	910	1 100	1 110	1 160
Hungary	900	1 210	1 190	1 060	1 060	1 040
Iceland	50	60	90	110	130	140
Ireland	300	360	440	560	580	610
Italy	5 380	5 800	6 350	6 950	7 080	7 180
Japan	13 550	14 510	18 370	21 400	21 590	21 970
Luxembourg	190	150	150	140	150	150
Mexico	2 310	4 140	5 190	6 190	6 280	6 430
Netherlands	2 610	2 720	2 780	3 110	3 120	3 170
New Zeeland	350	390	590	730	760	780
Norway	630	790	900	1 060	1 110	1 070
Poland	3 900	5 150	4 180	4 080	3 910	3 770
Portugal	300	430	720	950	1 020	1 030
Republic of Korea	880	1 730	3 880	6 910	7 590	8 110
Slovakia	650	880	910	730	730	730
Spain	2 190	2 870	3 790	4 720	4 960	5 230
Sweden	1 650	1 670	1 950	2 120	2 110	1 990
Switzerland	830	870	1 050	1 120	1 120	1 110
Turkey	1 020	1 320	2 200	3 000	2 950	3 230
United Kingdom	9 240	8 430	8 890	9 640	9 680	9 740
United States	72 700	75 850	80 690	91 340	94 110	96 280
EU 15	**48 500**	**50 820**	**55 380**	**60 270**	**60 660**	**61 140**
OECD Total	**157 310**	**170 710**	**189 020**	**214 000**	**218 270**	**222 610**

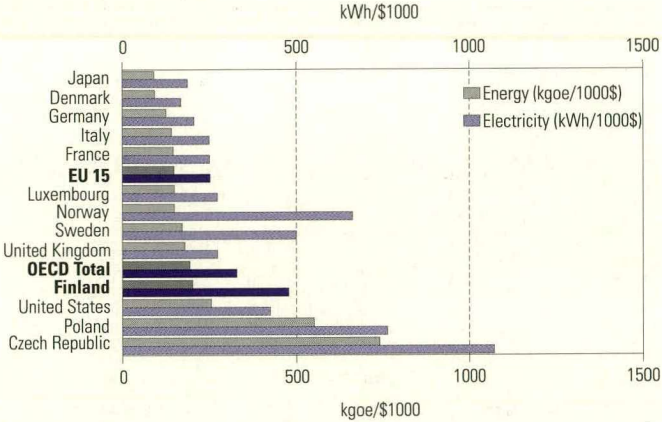
Source: Energy Balances of OECD Countries 1999–2000, IEA/OECD.

Electricity Consumption in OECD Countries, TWh

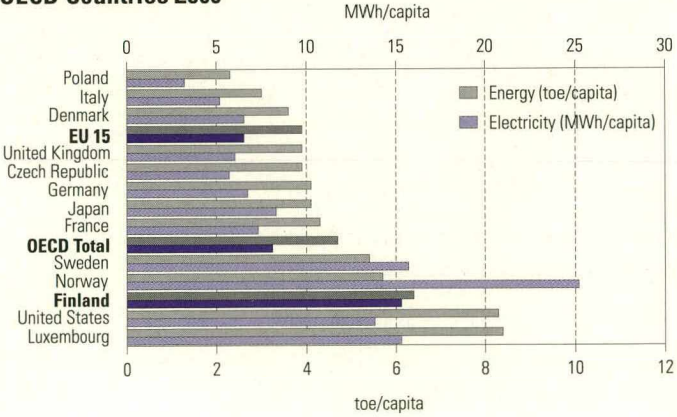
	1973	1980	1990	1998	1999	2000
Australia	52.5	82.1	134.3	170.1	175.5	179.9
Austria	25.9	33.7	44.0	50.8	50.9	53.3
Belgium	35.8	44.9	59.1	75.5	76.1	79.2
Canada	223.2	307.5	431.0	477.6	487.1	502.5
Czech Republic	34.1	43.1	53.0	52.2	51.2	52.3
Denmark	16.1	22.0	29.5	32.7	32.6	33.0
Finland	27.2	37.6	59.5	73.6	75.0	76.3
France	160.0	231.7	323.3	393.3	401.0	410.7
Germany	337.6	419.2	481.0	487.5	488.4	505.4
Greece	13.0	20.3	29.7	41.0	42.3	45.0
Hungary	18.6	26.9	33.0	30.1	31.1	30.9
Iceland	2.1	2.9	3.9	5.6	6.5	7.1
Ireland	6.2	8.7	12.0	17.8	18.9	20.3
Italy	125.8	163.6	218.8	260.8	267.3	279.3
Japan	421.7	520.2	765.1	932.1	953.5	978.3
Luxembourg	3.0	3.6	4.1	5.3	5.5	5.7
Mexico	31.6	57.2	100.2	147.2	155.6	166.4
Netherlands	46.1	58.9	75.5	95.6	97.6	100.8
New Zeeland	15.9	19.5	27.8	32.2	32.4	33.9
Norway	61.0	75.1	97.4	110.3	109.0	110.6
Poland	69.0	99.7	112.5	108.7	107.0	108.8
Portugal	8.3	14.6	24.0	34.4	36.7	38.9
Republic of Korea	12.8	32.7	94.4	218.8	241.8	263.6
Slovakia	..	..	..	21.0	22.7	22.5
Spain	60.7	92.0	129.2	169.7	181.7	194.7
Sweden	69.4	86.1	130.7	128.4	128.7	130.8
Switzerland	29.0	35.3	47.0	49.6	52.1	52.4
Turkey	10.4	20.4	46.8	87.7	91.2	98.3
United Kingdom	242.5	243.3	284.4	325.0	329.9	338.5
United States	1 715.9	2 099.8	2 712.6	3 373.9	3 430.1	3 568.3
EU 15	**1 177.7**	**1 480.2**	**1 904.6**	**2 191.3**	**2 232.7**	**2 311.9**
OECD Total	**3 875.6**	**4 902.6**	**6 563.7**	**8 008.3**	**8 179.5**	**8 487.5**

Sources: Electricity Information 1992, 1994, 1995, 1996, 1997, 1998, 2000, IEA/OECD; Energy Statistics of OECD Countries 1999–2000, IEA/OECD.

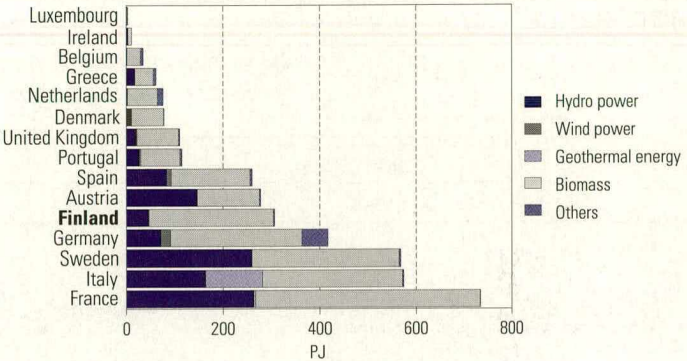
Consumption of Energy and Electricity per GDP-unit in Some OECD Countries 2000



Consumption of Energy and Electricity per Capita in Some OECD Countries 2000

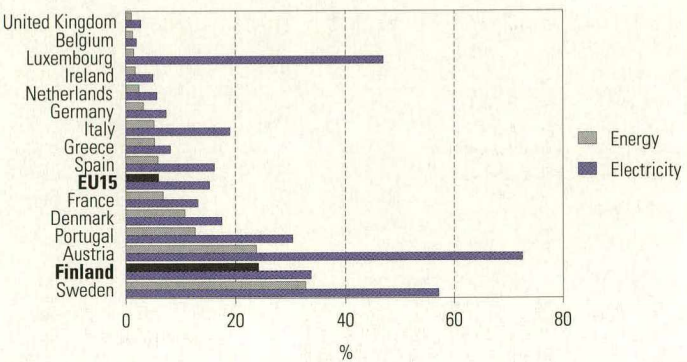


Production of Renewable Energy in EU Countries 1999



Renewable Energy in EU Countries 2000

Share in Primary Energy Supply and Electricity Generation



Includes energy produced from waste.

Source: Energy Balances of OECD Countries 1999–2000, IEA/OECD.

Consumer Prices of Fuel in Some European Countries in December 2001

	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		cent/l	cent/l	cent/l	cent/l
Austria	55	41	24	..	93	85	51	22
Belgium	67	41	28	24	101	84	39	20
Denmark	157	104	30	25	106	93	80	54
Finland	..	..	33	23	105	90	47	29
France	53	34	26	24	107	90	49	24
Germany	63	43	32	28	102	88	45	20
Greece	..	..	..	..	75	73	44	29
Ireland	58	27	19	..	89	83	51	24
Italy	53	69	28	23	109	97	91	26
Luxembourg	48	29	26	25	79	73	39	23
Netherlands	31	39	26	..	111	89	61	28
Norway	..	..	..	..	124	125	67	..
Portugal	67	67	35	..	89	62	..	31
Spain	59	45	23	22	85	78	49	28
Sweden	66	58	47	37	105	95	73	52
United Kingdom	..	..	18	14	134	141	40	23

[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.

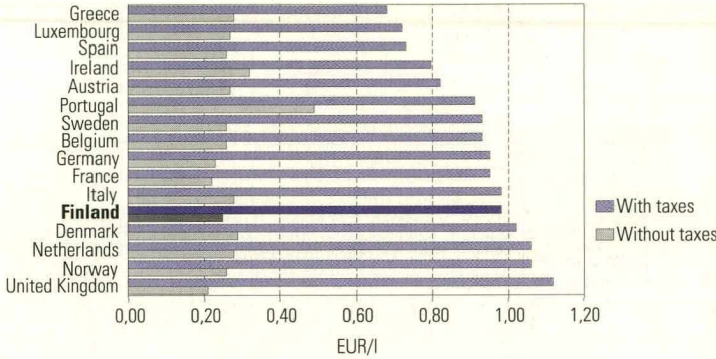
Sources: Finnish Oil and Gas Federation and Energy prices 2001, Eurostat.

Consumer Prices of Electricity in Some European Countries in January 2002, cent/kWh

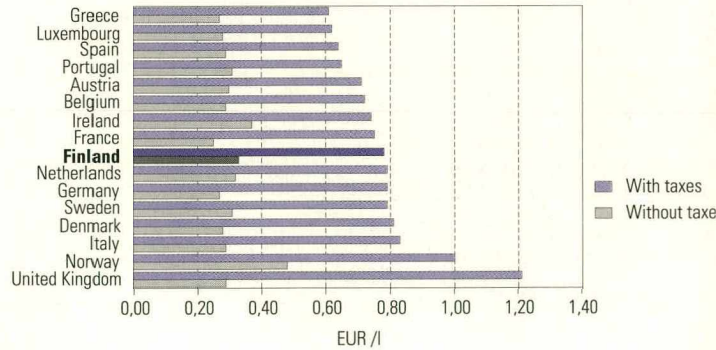
	Household	Industry		
Annual consumption	3 500 kWh	1.25 GWh	10 GWh	24 GWh
Power		0.5 MW	2.5 MW	4 MW
Austria	19.0	11.6	10.5	9.2
Belgium	13.9	10.7	8.5	7.1
Denmark	11.3	4.3	3.5	3.3
Finland	11.5	7.6	6.5	5.7
France	12.9	8.8	4.9	4.3
Germany	12.9	7.6	7.0	5.8
Greece	13.4	..	..	..
Ireland	9.9	10.7	8.4	7.3
Italy	11.2	..	..	..
Luxembourg	..	..	..	..
Netherlands	16.4	..	..	..
Norway	..	..	..	..
Portugal	6.3	6.9	6.4	5.4
Spain	10.5	7.0	6.0	5.7
Sweden	13.0	6.2	4.7	3.9
United Kingdom	..	..	..	..

Sources: Electricity prices for EU industry on 1 January 2002, Eurostat;
Electricity prices for EU households on 1 January 2002, Eurostat.

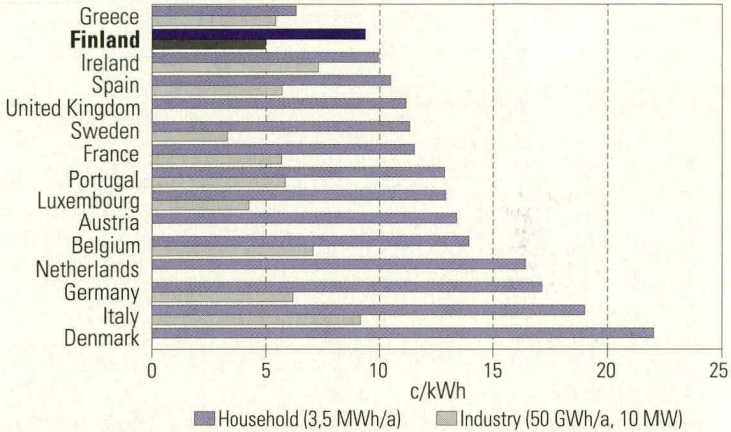
Consumer Prices of Unleaded Petrol in Some European Countries in December 2001



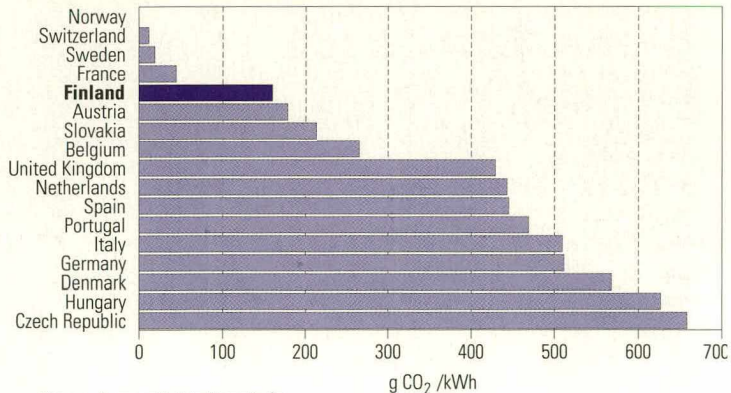
Consumer Prices of Diesel Fuel in Some European Countries in December 2001



Consumer Prices of Electricity in Some European Countries in January 2002



Carbon Dioxide Intensity in Power Generation in Some European Countries 2000



Source: Eurprog/Adato Energia Oy.

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	42.5	11.8	0.85
Diesel fuel	t	41.5	11.5	0.85
Jet fuel	t	43.3	12.0	0.80
Lamp kerosine	t	42.6	11.8	0.80
Other kerosines	t	43.1	12.0	0.81
Naphtha	t	44.4	12.3	0.70
Motor gasolines	t	43.8	12.2	0.75
Aviation gasolines	t	43.8	12.2	0.71
LPG	t	46.3	12.9	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:

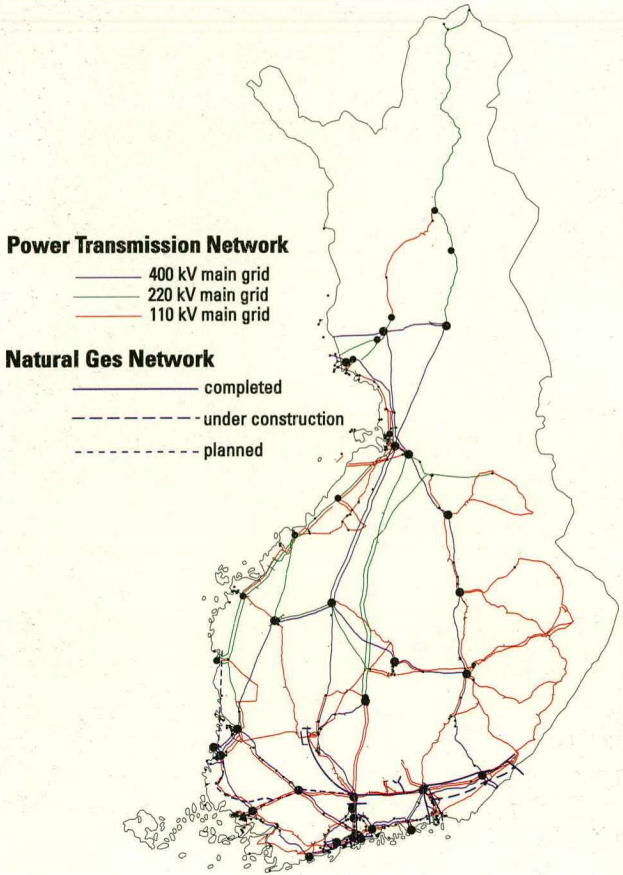
Small combustion of wood	55%
Peat	60%
Coal	60%
Heavy fuel oil	83%
Light fuel oil	78%
Natural gas	90%
District heating	100%
Electric heating	100%

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 2001



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