Energy in Finland

Pocketbook 2014

Area

Situated in northern Europe with an area of 338,432 km^2 of which 72% forest, 10% water, 8% cultivated land.

Population

5.5 million, with average density of 18 persons per square kilometre. More than two-thirds of the population reside in the southern third of the country.

Average temperatures in 2013

Town	Latitude	January	July
Helsinki	60°	–4.9°C	18.1°C
Sodankylä	67°	–11.5°C	14.6°C

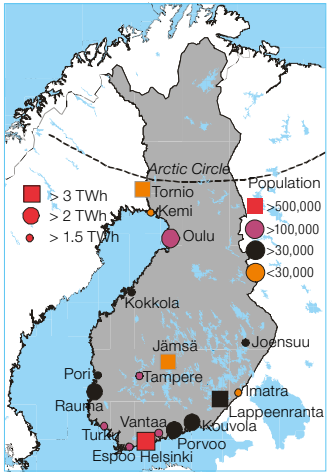
Economy

In 2013 GDP totalled € 193.4 bil., i.e. € 35,569/capita. In 2012 services were 71.3%, secondary production 26.0% and primary production 2.7% of the GDP.

Structure of industry, Value added gross in production in 2012*

	bil. €	%
Total industry	31.5	100
Mining and quarrying	0.7	2
Forest industry	3.9	12
Chemical industry	4.3	14
Metal industry	11.9	38
Basic metals and metal prod.	3.5	11
Electrical and electronics ind.	2.2	7
Other metal industry	6.3	20
Other manufacturing ind.	5.4	17
Energy supply	3.9	12
Water supply and waste management	1.5	5

Municipalities with high electricity consumption 2013



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 2013*

1,341 PJ (32.0 Mtoe)
247.0 GJ/capita (5.9 toe/capita)

Electricity consumption in 2013*

83.9 TWh
15,425 kWh/capita

Contents

Statistics Finland

The data in this pocketbook are based on the Preliminary Energy Statistics 2013 figures.

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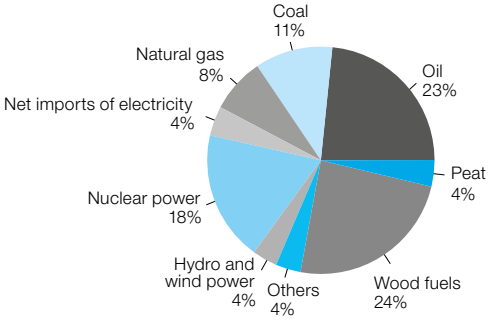
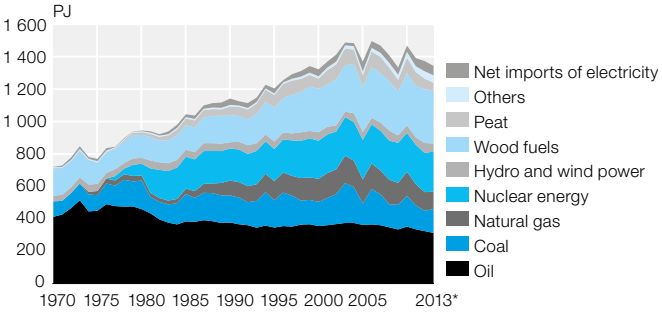
Total energy consumption by energy source 2013*

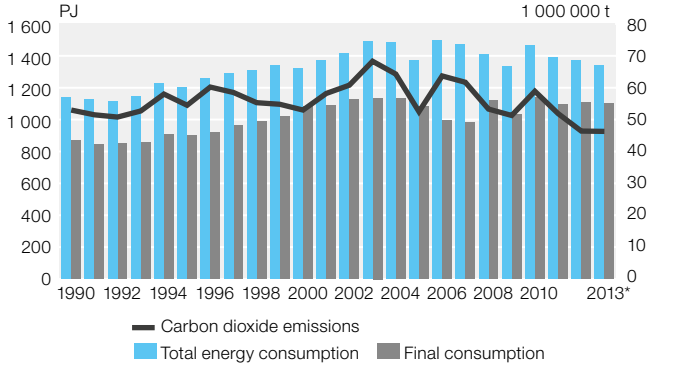


Total energy consumption in 2013* was 1 341 PJ.

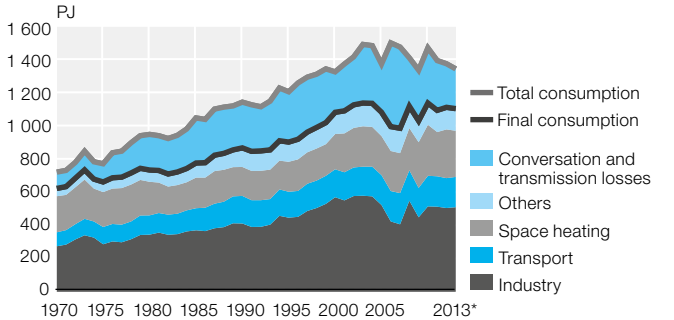
Total energy consumption by energy source 1970–2013*



Energy consumption and carbon dioxide emissions 1990–2013*



Total energy consumption and final energy consumption by sector 1970–2013*



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
1985	385.3	167.8	34.1	196.1	44.0
1990	377.8	167.4	90.8	197.8	38.7
1991	367.5	164.4	95.7	200.8	47.0
1992	361.2	141.9	99.3	198.2	53.9
1993	345.9	164.8	102.6	205.1	48.0
1994	359.2	205.5	113.3	199.9	42.0
1995	347.1	167.6	117.6	197.8	46.1
1996	356.4	206.8	123.1	203.8	42.2
1997	353.3	190.8	121.1	218.7	42.5
1998	364.7	148.0	138.7	228.8	53.3
1999	366.7	149.9	138.9	240.7	45.3
2000	355.8	149.1	141.9	235.4	52.3
2001	361.1	168.2	153.9	238.4	47.1
2002	367.7	185.0	152.9	233.4	38.5
2003	375.4	244.6	169.2	238.1	34.4
2004	374.8	220.6	163.0	238.0	53.9
2005	363.1	130.5	149.1	243.9	48.9
2006	365.9	217.0	159.4	240.0	41.3
2007	361.4	191.5	147.5	245.5	51.0
2008	348.2	142.0	150.8	240.5	61.8
2009	335.5	152.0	134.6	246.6	46.3
2010	353.4	189.0	148.7	238.8	46.9
2011	335.8	148.3	130.0	242.9	45.9
2012	324.9	125.1	115.0	240.7	61.8
2013*	314.5	146.8	107.1	247.6	48.6
Share					
2013*	23%	11%	8%	18%	4%
Annual Change					
12/13*	–3%	17%	–7%	3%	–21%

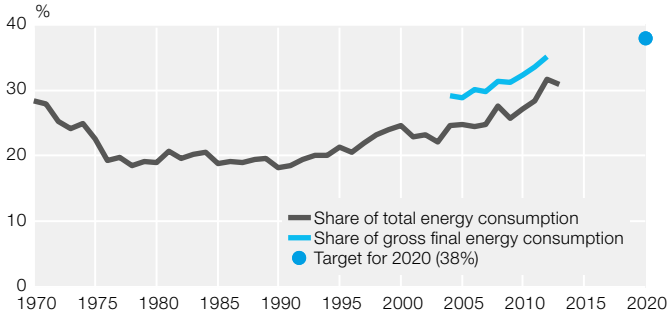
Wind power is included in hydro power. Total consumption of wind power in 2013* was 2,797PJ.

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	6.0	4.4	**946.9**	1980
151.3	41.1	9.1	17.0	**1 045.8**	1985
167.2	53.3	9.8	38.7	**1 141.4**	1990
158.6	56.0	8.9	25.9	**1 124.7**	1991
161.2	58.7	9.6	29.6	**1 113.5**	1992
180.5	64.5	8.7	27.1	**1 147.3**	1993
201.8	73.7	8.9	21.9	**1 226.2**	1994
207.5	79.4	9.8	30.3	**1 203.2**	1995
212.8	87.5	9.9	13.2	**1 255.6**	1996
237.2	88.0	12.1	27.6	**1 291.1**	1997
247.6	80.7	13.8	33.5	**1 309.2**	1998
272.8	71.8	14.6	40.0	**1 340.7**	1999
268.0	62.5	15.3	42.8	**1 323.1**	2000
261.6	86.9	17.1	35.9	**1 370.2**	2001
282.8	91.6	17.8	42.9	**1 412.6**	2002
287.9	101.2	19.8	17.5	**1 488.2**	2003
302.1	89.7	21.7	17.5	**1 481.4**	2004
281.0	69.1	23.4	61.3	**1 370.5**	2005
315.3	93.8	23.1	41.0	**1 496.8**	2006
302.4	102.5	25.4	45.2	**1 472.3**	2007
306.2	81.6	30.3	46.0	**1 407.3**	2008
270.3	72.0	32.4	43.5	**1 333.0**	2009
321.8	94.5	35.7	37.8	**1 466.6**	2010
316.8	84.9	36.2	49.9	**1 390.8**	2011
331.6	65.0	44.7	62.8	**1 371.6**	2012
324.0	48.7	47.7	56.6	**1 341.4**	2013*
					Share
24%	4%	4%	4%	**100%**	2013*
					Annual Change
–2%	–25%	7%	–10%	**–2%**	12/13*

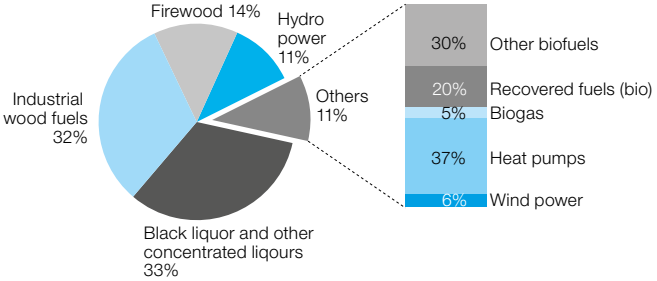
Renewable energy, PJ

	Hydro power	Wood fuels in industry and energy production	Black liquor and others	Small combustion of wood	Recovered fuels (bio fraction)	Heat pumps	Others	Total	Share of total energy consumption, %
1970	33.9	20.2	57.7	92.2	..	..	..	**204.0**	28
1980	36.4	31.1	67.4	43.6	..	0.4	..	**178.9**	19
1990	38.7	36.5	86.1	44.7	0.3	1.2	0.0	**207.4**	18
2000	52.0	84.7	137.9	45.4	2.3	1.5	1.4	**325.2**	25
2005	48.3	95.0	132.1	53.9	4.7	2.3	3.2	**339.6**	25
2006	40.7	103.6	156.0	55.7	4.2	3.1	3.2	**366.4**	24
2007	50.4	93.2	153.1	56.1	5.0	3.8	3.6	**365.3**	25
2008	60.9	103.7	143.7	58.8	5.9	6.7	7.8	**387.5**	28
2009	45.3	97.7	110.2	62.5	5.6	9.5	12.0	**342.7**	26
2010	45.9	116.4	135.7	69.7	6.1	11.0	12.6	**397.3**	27
2011	44.2	122.4	135.1	59.3	5.8	12.5	15.4	**394.8**	28
2012	60.0	130.7	135.8	65.1	8.1	16.2	18.3	**434.1**	32
2013*	45.8	133.0	135.8	57.5	9.3	17.1	16.9	**415.3**	31

Share of renewable energy in total energy consumption and gross final energy consumption, and target for 2020



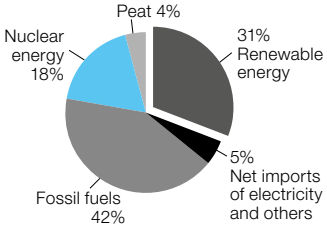
Renewable energy 2013*



The total consumption of renewable energy in 2013* was 415 PJ which is 31% of total energy consumption.

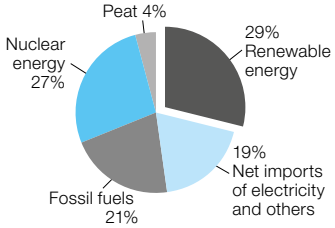
Renewable energy 2013*

In total energy consumption



Total 1 341 PJ

In electricity supply



Total 84 TWh

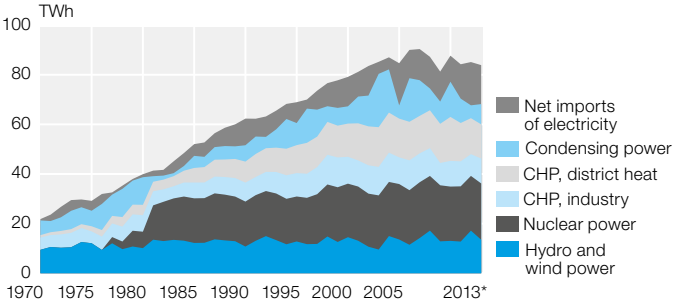
Supply and total consumption of electricity, TWh

	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**
1990	10.8	0.00	18.1	6.6	7.7	8.5	10.7	**62.3**
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	6.9	10.8	13.4	11.9	**79.2**
2001	13.0	0.07	21.9	10.8	10.5	15.0	10.0	**81.2**
2002	10.6	0.06	21.4	12.4	11.4	15.7	11.9	**83.5**
2003	9.5	0.09	21.8	21.5	11.5	16.0	4.9	**85.2**
2004	14.9	0.12	21.8	17.4	11.8	16.2	4.9	**87.0**
2005	13.4	0.17	22.4	5.3	10.8	15.6	17.0	**84.7**
2006	11.3	0.15	22.0	17.6	12.0	15.5	11.4	**90.0**
2007	14.0	0.19	22.5	14.4	11.6	15.1	12.6	**90.4**
2008	16.9	0.26	22.0	8.8	11.2	15.3	12.8	**87.2**
2009	12.6	0.28	22.6	9.0	9.0	15.8	12.1	**81.3**
2010	12.7	0.29	21.9	14.2	10.4	17.7	10.5	**87.7**
2011	12.3	0.48	22.3	9.8	10.1	15.5	13.9	**84.2**
2012	16.7	0.49	22.1	5.2	8.8	14.5	17.4	**85.1**
2013*	12.7	0.78	22.7	8.2	10.0	13.8	15.7	**83.9**
Share								
2013*	15%	1%	27%	10%	12%	16%	19%	**100%**
Annual Change								
12/13*	–24%	57%	3%	58%	14%	–5%	–10%	**–1%**

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

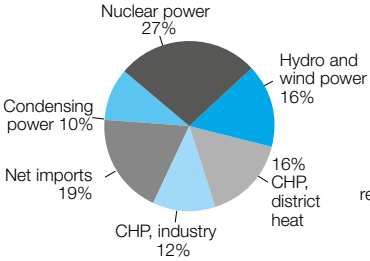
Sources: Statistics Finland, Finnish Energy Industries and Technical Research Centre of Finland VTT (wind power)

Electricity supply 1970–2013*

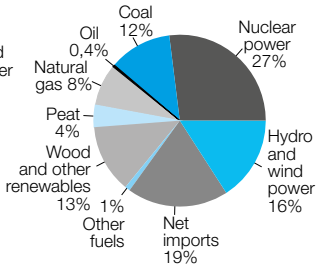


Electricity supply 2013*

By mode of production



By source



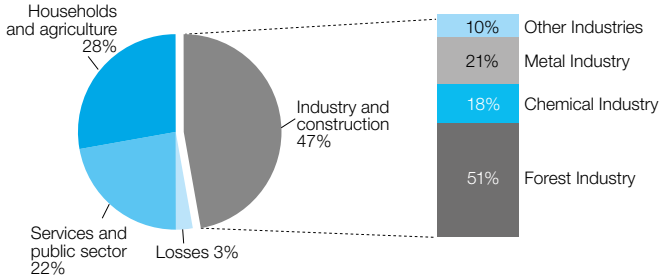
Total electricity supply in 2013* was 83.9 TWh

Electricity consumption by sector, TWh

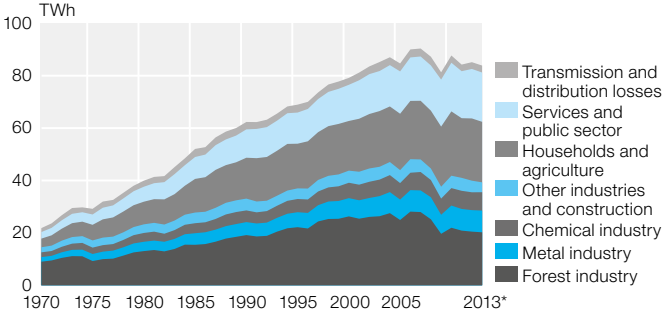
	Industry and construction					House-holds and agri-culture	Services and public sector	Transm. and distrib. losses	Total
	Total	Forest industry	Metal industry	Chemical industry	Others				
1970	14.5	9.0	1.8	1.8	1.9	3.3	2.5	1.5	**21.8**
1975	17.1	9.2	2.7	2.4	2.7	6.0	3.9	2.2	**29.2**
1980	23.3	13.0	3.6	3.4	3.3	8.6	5.7	2.3	**39.9**
1985	27.8	15.4	4.4	3.8	4.1	12.8	8.4	3.1	**52.0**
1990	33.1	19.1	5.0	4.5	4.5	15.6	10.8	2.8	**62.3**
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	43.8	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	26.4	7.7	6.3	4.9	21.3	15.3	3.4	**85.2**
2004	47.1	27.5	8.0	6.5	5.0	21.2	15.8	3.0	**87.0**
2005	44.0	24.9	7.8	6.3	4.9	21.5	16.2	3.0	**84.7**
2006	48.1	28.1	8.2	6.6	5.2	22.2	16.6	3.1	**90.0**
2007	48.0	27.9	8.3	7.0	4.8	22.4	16.9	3.0	**90.4**
2008	44.6	25.3	8.4	6.6	4.3	22.1	17.3	3.3	**87.2**
2009	37.6	19.8	7.2	6.2	4.5	22.9	18.0	2.8	**81.3**
2010	41.8	22.0	8.5	6.7	4.6	24.5	18.6	2.8	**87.7**
2011	40.7	20.7	8.2	6.6	5.1	22.9	18.0	2.7	**84.2**
2012	39.7	20.3	7.9	6.4	5.0	24.0	18.6	2.9	**85.1**
2013*	39.3	20.2	8.3	7.0	3.8	23.1	18.8	2.7	**83.9**
Share									
2013*	47%	24%	10%	8%	4%	28%	22%	3%	**100%**
Annual Change									
12/13*	–1%	0%	5%	9%	–25%	–4%	1%	–9%	**–1%**

Sources: Finnish Energy Industries and Statistics Finland

Electricity consumption by sector 2013*



Electricity consumption by sector 1970–2013*



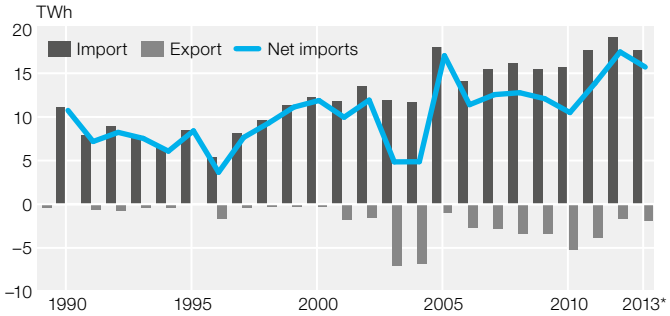
Energy sources in electricity generation, PJ

	Hydro power	Nuclear energy	Hard coal	Oil	Natural gas	Peat	Other fuels	Net imports of electr.	Total	CO_2 emis-sions (Mt)
1970	33.9	–	41.8	32.1	–	..	17.9	1.9	**127.6**	..
1980	36.4	72.3	102.7	26.8	12.6	..	29.2	4.4	**284.4**	14
1990	38.7	197.8	61.3	9.7	24.8	17.2	29.1	38.7	**417.3**	11
2000	52.3	235.4	55.4	3.3	43.2	21.5	50.3	42.8	**504.2**	14
2005	48.9	243.9	37.6	3.2	47.1	25.4	60.8	61.3	**528.2**	11
2006	41.3	240.0	119.8	3.3	58.3	43.0	68.8	41.0	**615.4**	21
2007	51.0	245.5	97.1	3.0	45.2	46.3	62.4	45.2	**595.8**	19
2008	61.8	240.5	54.1	3.8	47.4	31.5	66.5	46.0	**551.7**	13
2009	46.3	246.6	74.3	3.3	40.9	24.5	50.9	43.5	**530.2**	13
2010	46.9	238.8	103.2	2.8	46.9	38.5	66.1	37.8	**581.0**	17
2011	46.0	243.0	72.7	2.3	41.7	33.9	58.3	49.9	**547.9**	13
2012	61.8	240.7	41.8	2.2	27.8	19.2	64.2	62.8	**520.5**	9
2013*	48.6	247.6	77.4	2.0	29.8	19.3	62.5	62.8	**550.1**	11

Wind power is included in hydro power.

Sources: Statistics Finland, Finnish Energy Industries and Technical Research Centre of Finland VTT (wind power)

Imports and exports of electricity 1990–2013*



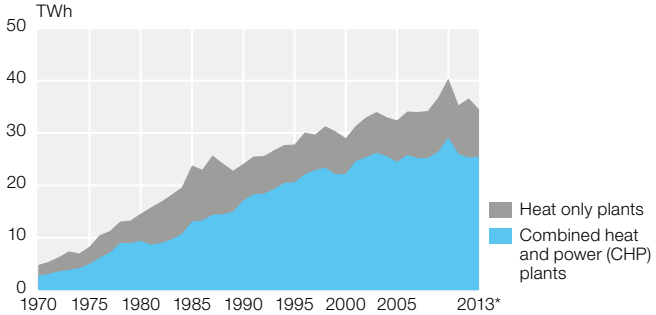
Source: Finnish Energy Industries

Production and consumption of district heat, TWh

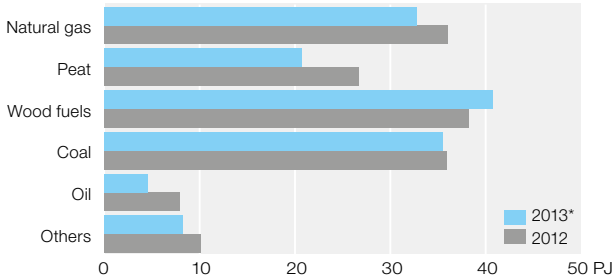
	Net production of district heat			Network and meas-uring losses	Consumption of district heat			
	Heat only plants	CHP plants	Total		Residential buildings	Industrial buildings	Other consumers	Total
1970	2.0	2.8	**4.8**	0.3	..	0.6	..	**4.5**
1975	3.3	5.0	**8.2**	0.6	4.7	0.9	2.0	**7.7**
1980	5.2	9.4	**14.6**	1.3	7.8	1.4	4.1	**13.3**
1985	10.7	13.1	**23.8**	2.2	12.6	2.1	7.0	**21.7**
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	6.8	22.2	**29.0**	2.8	14.9	2.6	8.8	**26.3**
2001	6.7	24.6	**31.4**	2.2	16.2	2.9	10.1	**29.2**
2002	7.6	25.4	**33.0**	3.0	16.6	3.0	10.4	**30.0**
2003	7.8	26.2	**34.0**	2.8	17.6	3.0	10.6	**31.2**
2004	7.4	25.5	**33.0**	2.7	17.0	2.9	10.3	**30.3**
2005	7.9	24.4	**32.4**	2.6	16.6	3.0	10.2	**29.8**
2006	8.3	25.8	**34.1**	3.5	17.1	3.1	10.5	**30.7**
2007	8.8	25.2	**34.0**	3.2	17.3	3.1	10.4	**30.8**
2008	9.0	25.2	**34.2**	3.4	17.2	3.0	10.6	**30.8**
2009	10.3	26.4	**36.6**	3.1	18.3	3.3	12.0	**33.6**
2010	11.3	29.1	**40.4**	3.3	20.3	3.7	13.2	**37.1**
2011	9.3	25.9	**35.2**	2.8	17.6	3.3	11.5	**32.4**
2012	11.7	26.5	**38.1**	2.9	19.3	3.5	12.4	**35.2**
2013*	9.0	25.5	**34.5**	3.4	..	..	..	**31.1**

Sources: Statistics Finland, Finnish Energy Industries/District heating and since 1995 also Association of Finnish Local and Regional Authorities.

Production of district heat 1970–2013*

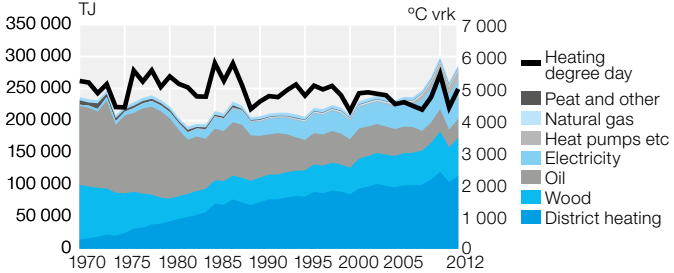


Fuel consumption in production of district heat 2012–2013*

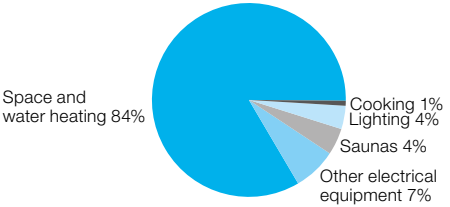


Sources: Statistics Finland, Finnish Energy Industries

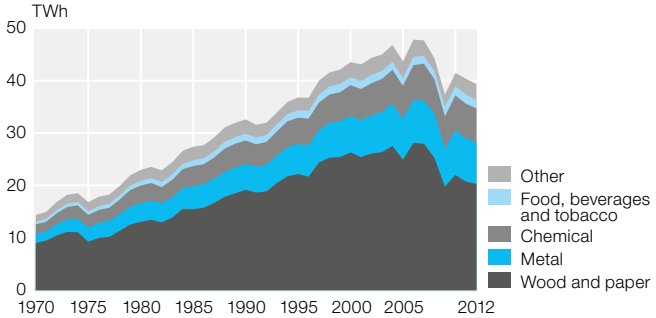
Consumption of energy for heating residential, commercial and public buildings 1970–2012



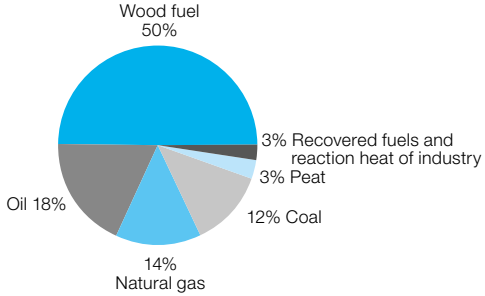
Energy consumption in households 2012



Electricity consumption by branch of industry 1970–2012



Fuel consumption in industry 2012

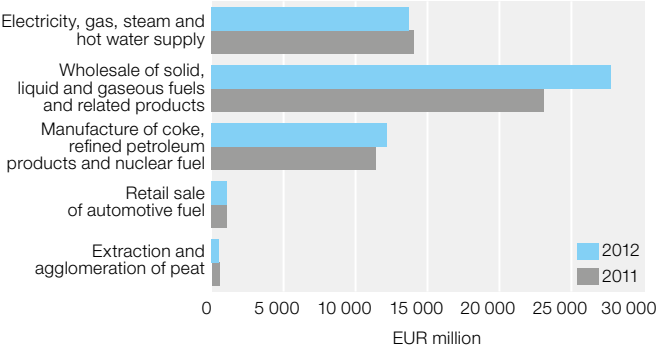


Total fuel consumption in industry in 2012 was 366 PJ.

Enterprises in energy sector in 2012

	Number of enterprises	Turnover, EUR mil.	Employees	Staff expenses, EUR mil.
Wholesale of solid, liquid and gaseous fuels and related products	147	13 766	1 070	83
Electricity, gas, steam and hot water supply	774	13 705	13 064	830
Extraction and agglomeration of peat	463	515	1 282	59
Retail sale of automotive fuel	757	1 084	3 944	125
Manufacture of coke, refined petroleum products and nuclear fuel	15	12 169	2 530	200

Turnover of enterprises in energy sertor 2011–2012



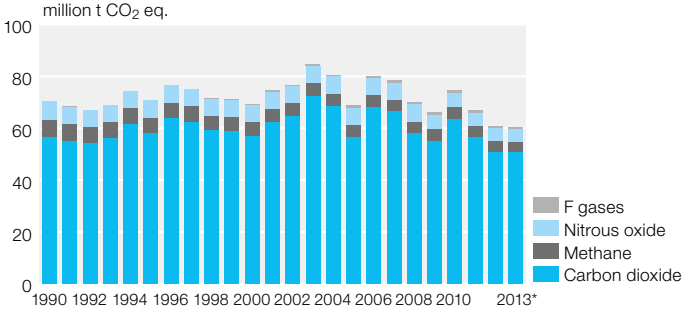
Source: Statistics Finland, Financial statements of enterprises.

Greenhouse gas emissions 1990–2013*

The gases included in the Kyoto Protocol

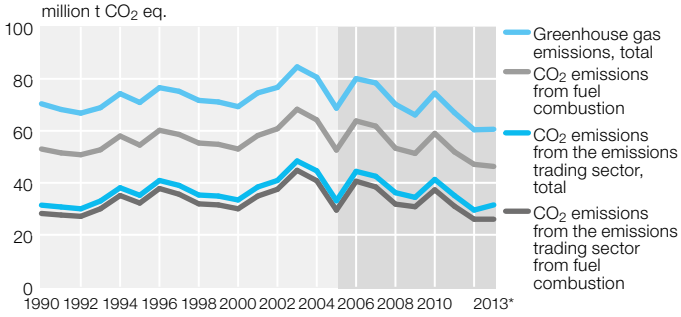
	1990	1995	2000	2005	2010	2011	2012	2013*
	million tonnes of CO_2 equivalent							
Energy	54.5	56.0	54.4	54.0	60.5	53.3	47.8	47.3
Industrial prosesses	5.1	4.7	5.6	6.4	5.8	5.6	5.3	5.3
Solvent and other product use	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Agriculture	6.5	6.0	5.8	5.7	5.9	5.8	5.7	5.9
Waste	4.0	3.9	3.3	2.4	2.2	2.1	2.1	2.0
Total emission without land use, land use change and forestry	**70.3**	**70.8**	**69.2**	**68.6**	**74.4**	**66.9**	**61.0**	**60.6**
Land use, land use change and forestry	–13.7	–12.8	–19.2	–28.6	–24.1	–24.1	–25.9	–17.7

Greenhouse gas emissions by gases 1990–2013*

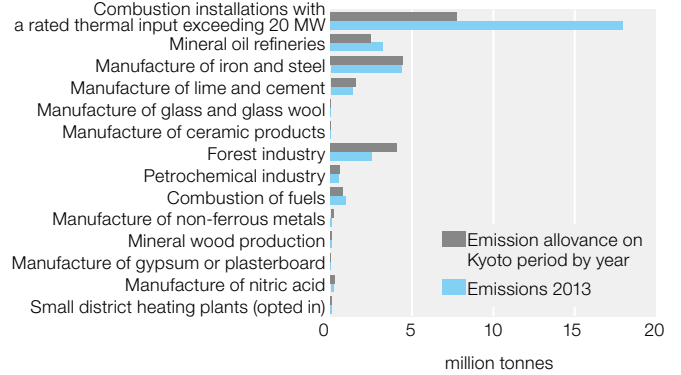


Source: Statistics Finland, Greenhouse Gas Inventory

Finland's greenhouse gas emissions 1990–2013*

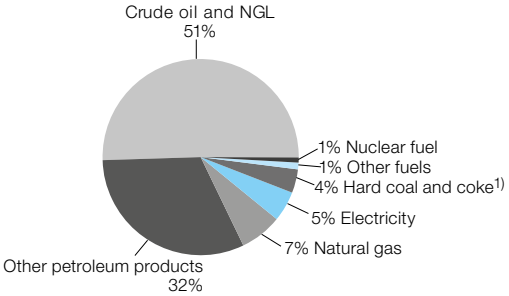


National allowances under EU ETS and verified CO_2 emissions for 2013 by branch in Finland



Source: European Commission

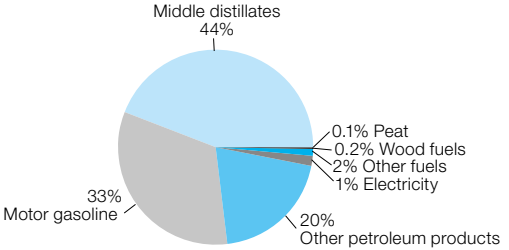
Value of energy imports 2013*



1) includes coking coal

Total imports of energy products were 13 822 million euros in 2013.
That was 23.8% of total imports to Finland.

Value of energy exports 2013*



Total exports of energy products were 6 974 million euros in 2013.
That was 12.5% of total exports to Finland.

Source: Finnish Customs/Foreign Trade Statistics

Energy imports 2013*

		Russia	Sweden	Denmark	Other countries	Total Amount	Total Value mil. €
Coal and coal products	1000 t	3 587	0	–	1 850	**5 437**	**508**
Natural gas	mil. m^3	3 299	–	–	0	**3 299**	**977**
Oil and petroleum products [1]	1000 t	13 052	1 263	726	3 261	**18 304**	**11 498**
Peat	1000 t	11	28	–	8	**47**	**1**
Wood fuels [2]	1000 t	38	0	0	22	**108**	**10**
Nuclear fuel	tU	34	18	–	19	**71**	**121**
Electricity	GWh	5	12	–	1	**18**	**708**
Value	**€ mil.**	**9 154**	**1 560**	**484**	**2 624**		**13 822**

1) Includes natural gas condensate
2) Includes wood pellets and other wood fuels

Source: Finnish Customs/ Foreign Trade Statistics

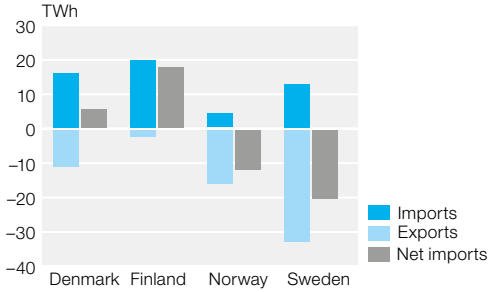
Energy exports 2013*

		Sweden	Nether-lands	United Kingdom	Other countries	Total Amount	Total Value mil. €
Coke	1000 t	4	13	–	49	**66**	**7**
Petroleum products	1000 t	2 180	1 365	1 121	4 672	**9 338**	**6 868**
Peat	1000 t	5	4	0	47	**55**	**7**
Wood fuels [1]	1000 t	110	–	–	37	**147**	**14**
Electricity	TWh	0	–	–	2	**2**	**78**
Value	**€ mil.**	**1 802**	**806**	**762**	**3 604**		**6 974**

1) Includes wood pellets and other wood fuels

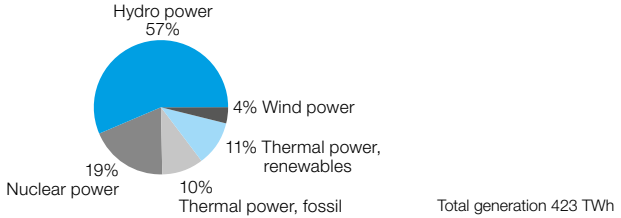
Source: Finnish Customs/ Foreign Trade Statistics

Imports and exports of electricity in Nordic countries 2013



Source: Swedenergy, Norwegian Water Resources and Energy Directorate

Total electricity generation in Nordic Countries 2012

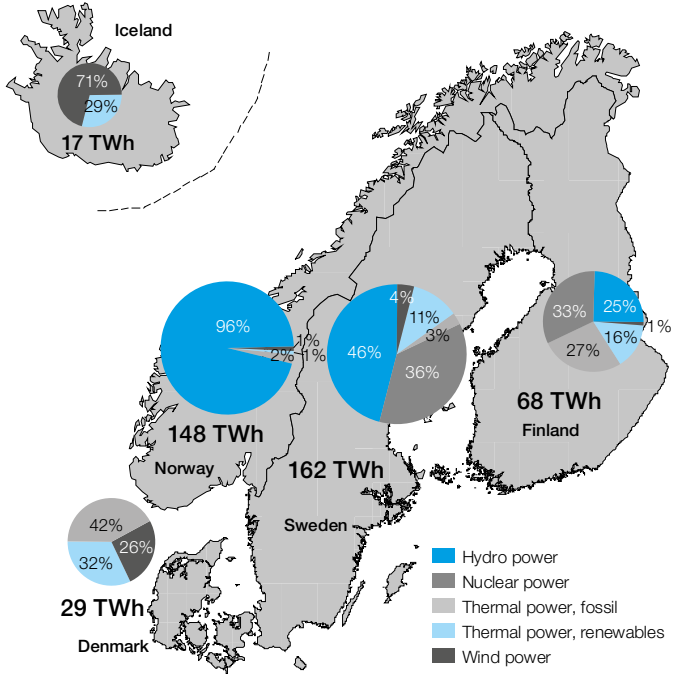


Electricity consumption in Nordic Countries 2012, TWh

Sweden	142
Norway	128
Finland	85
Denmark	34
Iceland	17
Total	406

Source: Entso-e: Statistical Yearbook 2011, Monthly Statistics 2012

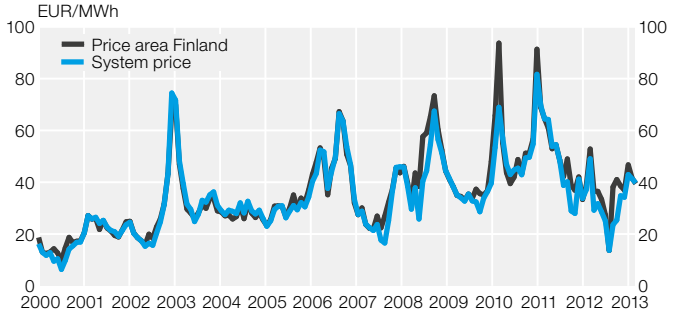
Electricity generation in Nordic Countries 2012



Electricity spot prices of the nordic power exchange NordPool by price area, €/MWh

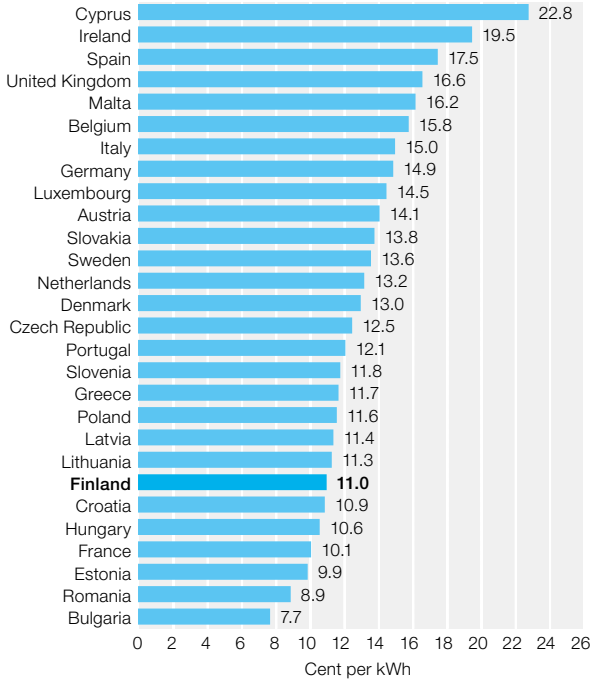
Year	Month	Oslo	Stockholm	Helsinki	Copenhagen	Tallinn	System
2013	1	42.19	41.42	41.59	40.89	41.77	41.39
	2	39.84	39.43	39.43	40.20	39.82	39.67
	3	45.26	44.46	45.01	41.58	45.28	44.83
	4	47.79	43.91	43.91	43.55	43.31	45.91
	5	36.96	36.86	37.35	37.40	37.14	36.87
	6	32.41	34.20	38.63	34.32	53.36	33.46
	7	32.99	34.22	37.03	36.44	40.20	33.81
	8	32.71	40.38	43.47	41.37	43.66	35.40
	9	35.56	44.61	47.76	46.30	47.38	38.42
	10	36.86	41.36	45.95	41.86	46.76	38.33
	11	36.02	36.96	38.04	39.88	42.32	36.70
	12	32.46	32.59	35.65	31.69	36.84	32.66

Development of spot prices on Nord Pool



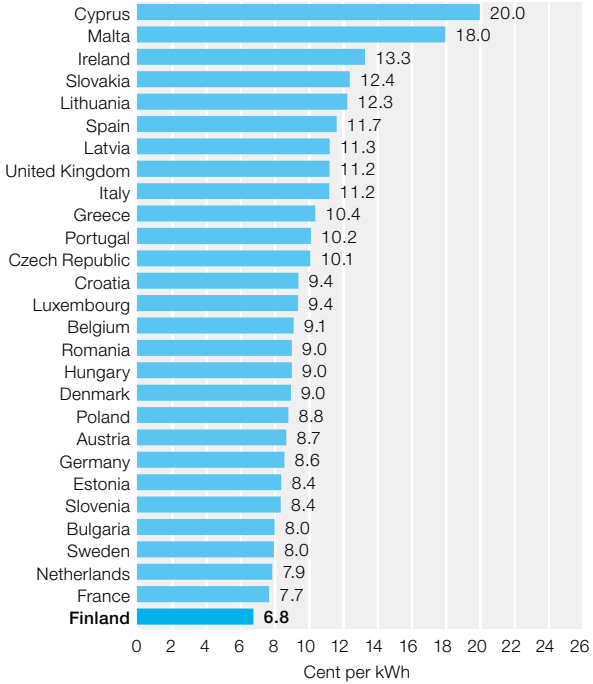
Source: Nord Pool

Electricity prices for households on the 2nd half of 2013



Households annual consumption of 2 500–5 000 kWh. Prices include taxes

Electricity prices for industry on the 2nd half of 2013



Electricity prices to industrial consumers with annual consumption of 500–2 000 MWh.
Prices include taxes.

Total energy consumption in EU, PJ

	1985	1990	1995	2000	2005	2010	2011	2012
Germany	15 040	14 910	14 300	14 330	14 310	13 970	13 280	13 370
France	8 540	9 540	10 120	10 790	11 570	11 180	10 800	10 820
United Kingdom	8 530	8 820	9 310	9 650	9 800	8 840	8 260	8 470
Italy	5 590	6 430	6 770	7 290	7 850	7 320	7 200	6 830
Spain	3 170	3 770	4 270	5 180	6 040	5 440	5 370	5 330
Poland	..	4 330	4 140	3 730	3 870	4 230	4 240	4 100
Netherlands	2 550	2 790	3 040	3 160	3 410	3 630	3 360	3 420
Belgium	1 840	2 040	2 260	2 480	2 460	2 560	2 500	2 360
Sweden	1 960	1 990	2 150	2 050	2 130	2 130	2 080	2 080
Czech Republic	..	2 090	1 750	1 720	1 890	1 870	1 810	1 790
Romania	..	2 430	1 940	1 530	1 640	1 500	1 530	1 480
Finland	**1 120**	**1 200**	**1 230**	**1 360**	**1 450**	**1 550**	**1 490**	**1 430**
Austria	990	1 050	1 130	1 210	1 440	1 450	1 410	1 410
Greece	990	940	1 000	1 180	1 310	1 200	1 160	1 160
Hungary	..	1 210	1 100	1 060	1 160	1 080	1 050	990
Portugal	520	760	860	1 060	1 150	1 020	990	930
Bulgaria	..	1 160	950	780	830	740	800	760
Denmark	820	750	850	830	820	840	780	760
Slovakia	..	910	740	770	800	750	730	700
Ireland	370	430	460	600	630	630	590	580
Croatia	..	380	300	330	370	360	360	340
Lithuania	..	670	360	300	360	280	290	300
Slovenia	..	240	250	270	310	300	300	290
Estonia	..	420	230	210	240	260	260	260
Latvia	..	330	190	160	190	200	180	190
Luxembourg	130	150	140	150	200	190	190	190
Cyprus	..	70	80	100	110	110	110	110
Malta	..	20	30	30	40	40	40	40
EU 28	..	**69 800**	**69 960**	**72 300**	**76 380**	**73 680**	**71 150**	**70 480**

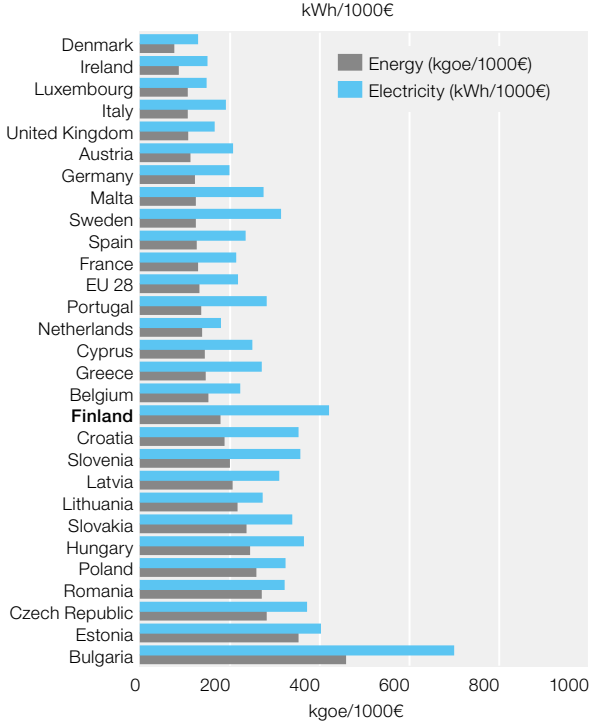
Source: Eurostat

Electricity consumption in EU, TWh

	1985	1990	1995	2000	2005	2010	2011	2012
Germany	424.6	455.1	451.2	483.5	522.3	532.4	525.5	525.8
France	252.9	302.2	343.1	384.9	422.8	444.6	414.2	430.8
United Kingdom	242.1	274.4	294.7	329.4	348.7	328.8	317.9	317.6
Italy	173.7	214.6	238.3	273.0	300.9	299.3	301.8	296.7
Spain	102.8	125.8	140.9	188.5	242.2	245.4	242.6	239.4
Sweden	113.6	120.4	124.6	128.7	130.7	131.2	124.6	127.3
Poland	92.1	96.2	89.7	98.6	105.4	119.1	121.9	122.6
Netherlands	61.5	73.5	82.7	97.8	104.5	106.9	107.5	106.5
Finland	**48.4**	**58.0**	**68.4**	**77.5**	**80.3**	**83.3**	**80.2**	**83.0**
Belgium	48.5	58.9	65.2	75.6	80.9	83.4	80.0	80.7
Austria	37.0	42.8	46.7	51.5	58.3	62.2	62.2	63.0
Czech Republic	43.3	48.2	48.1	49.4	55.3	57.2	56.8	56.7
Greece	23.8	28.5	34.1	43.2	50.9	53.1	51.8	52.0
Portugal	17.4	23.5	28.8	38.4	46.3	49.9	48.4	46.2
Romania	..	54.2	39.7	33.9	38.9	41.6	42.7	42.1
Hungary	30.2	31.6	27.7	29.4	32.3	34.2	34.5	35.2
Denmark	25.4	28.4	31.0	32.5	33.5	32.1	31.7	31.1
Bulgaria	..	35.3	28.7	24.3	25.7	27.2	28.4	27.9
Ireland	9.8	11.9	14.8	20.2	24.1	25.3	24.6	24.3
Slovakia	21.5	25.1	22.1	22.4	22.9	24.1	24.8	23.9
Croatia	..	13.3	9.9	11.8	14.4	15.9	15.7	15.4
Slovenia	..	9.2	9.3	10.5	12.7	12.0	12.6	12.5
Lithuania	..	12.0	6.4	6.2	8.0	8.3	8.6	8.9
Estonia	..	8.3	4.5	4.5	5.7	6.2	6.2	6.8
Luxembourg	3.8	4.1	5.0	5.8	6.1	6.6	6.5	6.3
Latvia	..	6.8	4.6	5.0	6.0	6.0	6.0	6.0
Cyprus	..	1.8	2.2	3.0	4.0	4.9	4.5	4.4
Malta	..	0.9	1.3	1.6	2.0	1.6	1.8	1.9
EU 28	**1 772.3**	**2 165.2**	**2 263.7**	**2 531.1**	**2 785.8**	**2 843.7**	**2 784.8**	**2 796.0**

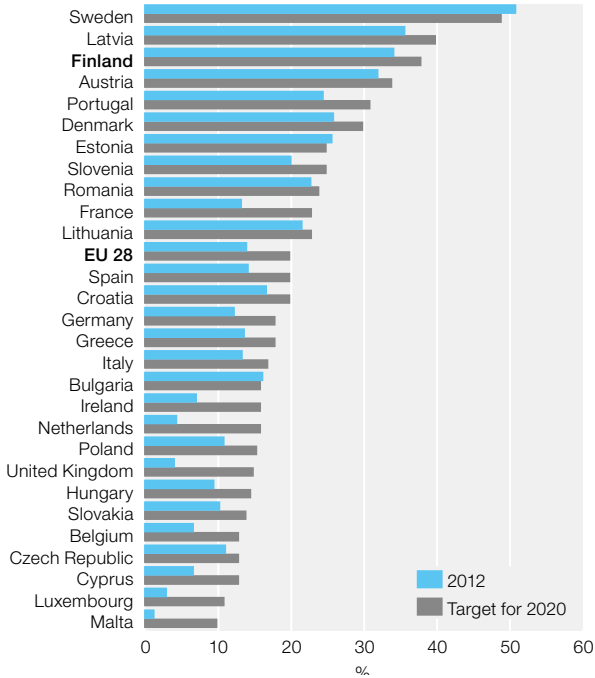
Source: Eurostat

Consumption of energy and electricity per GDP-unit in EU countries 2012



Source: Eurostat

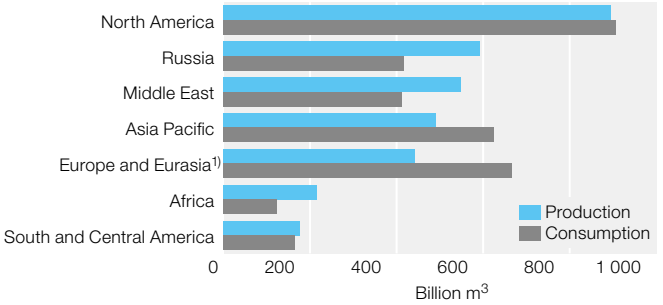
Share of renewable energy in gross final energy consumption in 2012, and the target for 2020



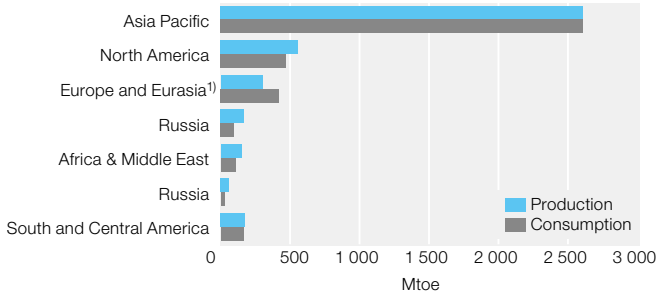
This indicator is calculated on the basis of data covered by Regulation (EC) No 1099/2008 on energy statistics. Reporting countries provide additional information on renewable source not covered by the Regulation. This indicator may be considered an estimate of the indicator described in Directive 2009/28/EC because statistical systems in some countries are not yet fully developed to meet all the requirements of this Directive.

Source: Eurostat

Gas production and consumption by region in 2012



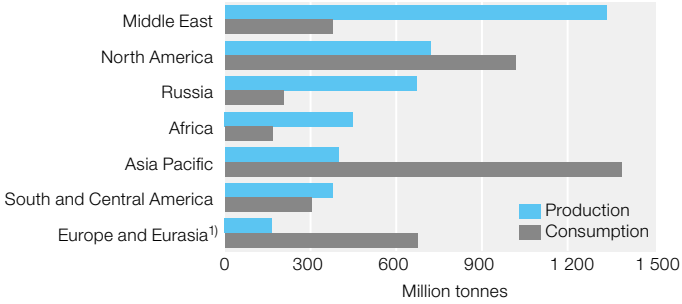
Coal production and consumption by region in 2012



1) excludes Russia

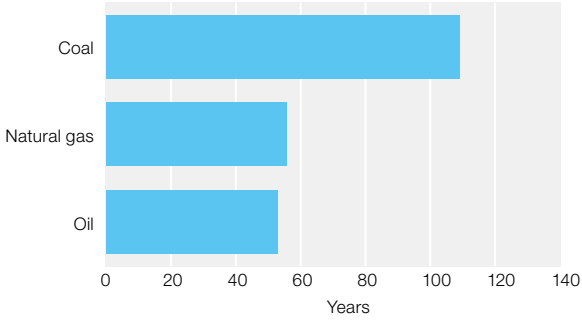
Source: BP statistical review of world energy June 2013

Oil production and consumption by region in 2012



1) excludes Russia

Word oil, natural gas and coal reserve sufficiency



Total reserves at the end of 2012: oil 236 billion tonnes, natural gas 187 trillion m^3, coal 861 billion tonnes.

Source: BP statistical review of 2orld energy June 2013

Electricity network information

	1990	2000	2011	2012
Transformer substations, number				
High voltage substations	715	591	966	984
Distribution substations	114 019	124 851	129 848	133 138
Lengths of low voltage lines (0.4 kV–1 kV), km				
Overhead lines	162 076	158 576	150 212	148 769
Cables (inc. sea cable)	45 705	63 327	85 753	89 235
Cabling rate	22%	29%	36%	38%
Lengths of medium voltage lines (over 1 kV–70 kV), km				
Overhead lines	122 329	121 754	121 640	121 191
Cables (inc. sea cable)	10 586	12 116	15 929	17 005
Cabling rate	8%	9%	12%	12%
Lengths of high voltage lines (110 kV–400 kV), km				
110 kV	14 000	15 050	15 697	15 754
220 kV	2 471	2 510	2 568	2 568
400 kV	3 164	3 926	4 586	4 586

Source: Energy Authority

Energy statistics by Statistics Finland

Energy online service

The Energy online service provides information on the energy industry as an extensive compilation of Excel tables and statistical graphs. The service is in Finnish, English or Swedish, and is updated annually.
The Energy online service is available at
http://pxweb2.stat.fi/Sahkoiset_julkaisut/energia2013/.

Energy in Finland

Statistical pocketbook on energy statistics.

Internet www.stat.fi/energy (www.tilastokeskus.fi/energia)

The updated statistics, latest tables and figures on
– consumption of hard coal
– energy consumption in households
– energy prices
– energy supply and consumption
– energy in manufacturing
– production of electricity and heat

Net heat contents and densities of energy sources

Fuels	Unit	Net heat content		Density
		GJ	MWh	t/m³
Crude oil	t	41.8	11.6	0.86
Heavy fuel oil	t	41.1	11.4	0.98
Light fuel oil	t	42.8	11.9	0.85
Diesel fuel	t	42.8	11.9	0.84
Kerosenes	t	43.3	12.0	0.80
Other kerosines	t	43.1	12.0	0.81
Naphtha	t	44.3	12.3	0.70
Motor gasolines	t	41.8	11.6	0.75
Aviation gasolines	t	43.7	12.1	0.71
LPG	t	46.2	12.8	0.51
Refinery gases	t	50.0	13.9	
Hard coal	t	25.0	6.9	
Coke	t	29.3	8.1	
Natural gas	1 000 m³ (0°C)	36.0	10.0	
Blast furnace gas	1 000 m³	3.8	1.1	
Coke oven gas	1 000 m³	16.7	4.6	
Black liquor	t (dry matter)	11.5	3.2	
Wood pellets	t	15–18		
Bark	t	5–11		
Sawdust	t	6–10		
Forest residue chips	t	6–11		
Whole tree chips	t	7–11		
Chips	loose m³	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	= 1 000	= 10^3
M	= mega	= 1 000 000	= 10^6
G	= giga	= 1 000 000 000	= 10^9
T	= tera	= 1 000 000 000 000	= 10^{12}
P	= peta	= 1 000 000 000 000 000	= 10^{15}

Carbon dioxide factors for some fuels

	g CO_2 / MJ	
Motor gasolines	69.0	Default bio share 8%
Diesel fuel	68.0	Default bio share 8%
Light fuel oil	73	Default bio share 1%
Heavy fuel oil	78.8	
Kerosenes	73.2	
LPG	65.0	
Other oils	71.3–79.2	
Hard coal	93.3	
Coke	108.0	
Natural gas	55.04	
Milled peat	105.9	
Bark, wood fuel	109.6	
Industrial wood residue	109.6	
Black liquor	109.6	

Source: Statistics Finland/Fuel classification 2014
www.tilastokeskus.fi/polttoaineluokitus

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 was 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%

Source: 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

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