Statistics Finland

ENERGY IN FINLAND
2018

2 Finland in brief

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 2017

Town	Latitude	January	July
Helsinki	60°	–1.9°C	16.0°C
Sodankylä	67°	–10.2°C	15.1°C

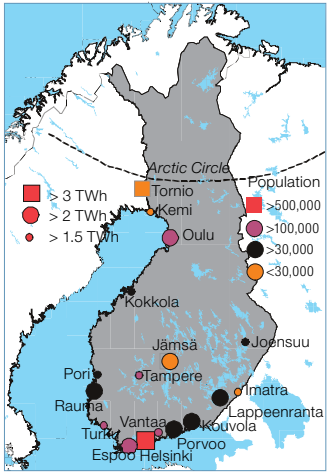
Economy

In 2017* GDP totalled € 223.5 bil., i.e. € 40,612/capita. In 2017* services were 70.2%, secondary production 27.1% and primary production 2.7% of the GDP.

Structure of industry, Value added gross in production in 2016

	bil. €	%
Total industry	32.9	100
Mining and quarrying	0.6	2
Forest industry	4.0	12
Chemical industry	5.0	15
Metal industry	13.4	41
Basic metals and metal prod.	3.8	11
Electrical and electronics ind.	3.9	12
Other metal industry	5.7	17
Other manufacturing ind.	4.9	15
Energy supply	3.6	11
Water supply and waste management	1.4	4

Municipalities with high electricity consumption 2016



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, and nickel are extracted.

Total energy consumption in 2017*

1,353 PJ (32.3 Mtoe)
246.0 GJ/capita (5.9 toe/capita)

Electricity consumption in 2017*

85.5 TWh
15,522 kWh/capita

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Statistics Finland

The data in this pocketbook are based on the Preliminary Energy Statistics 2017 figures.

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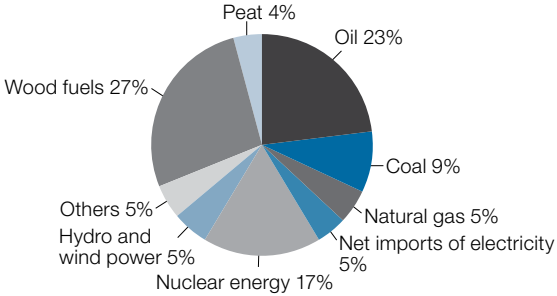
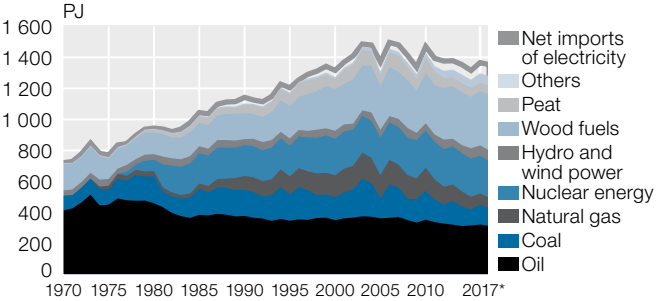
4 Total energy consumption

Total energy consumption by energy source 2017*

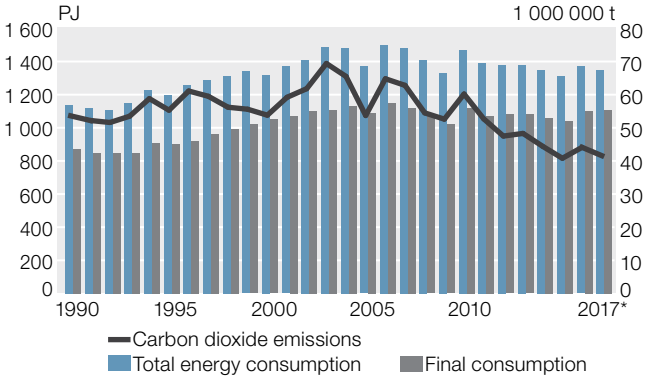


Total energy consumption in 2017* was 1 353 PJ.

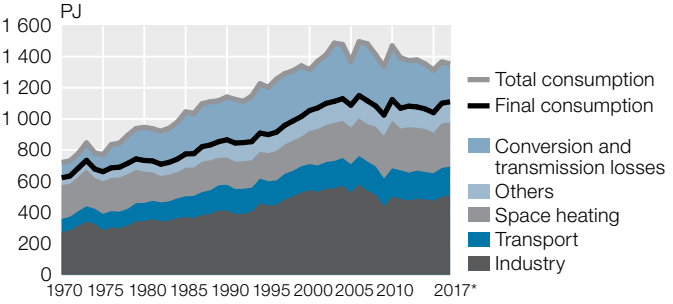
Total energy consumption by energy source 1970–2017*



Energy consumption and carbon dioxide emissions 1990–2017*



Total energy consumption and final energy consumption by sector 1970–2017*



Total Energy Consumption by Energy Source, PJ

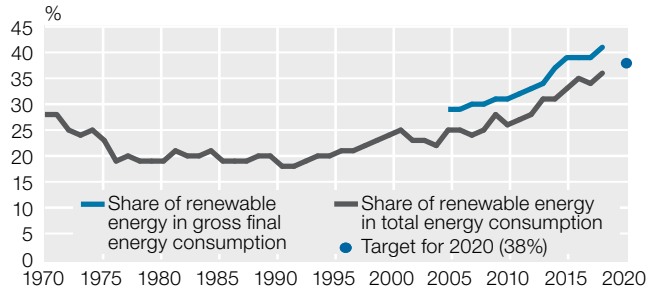
	Oil	Coal	Natural gas	Nuclear energy	Hydro power	Wind power
1975	451.0	94.8	26.5	–	43.5	–
1980	460.3	176.2	32.2	72.3	36.4	–
1985	385.3	167.8	34.1	196.1	44.0	–
1990	377.8	167.4	90.8	197.8	38.7	0.0
1995	347.1	167.6	117.6	197.8	46.0	0.0
1996	356.4	206.8	123.1	203.8	42.1	0.0
1997	353.3	190.8	121.1	218.7	42.5	0.1
1998	364.7	148.0	138.7	228.8	53.2	0.1
1999	366.7	149.9	138.9	240.7	45.2	0.2
2000	350.7	146.7	141.9	235.4	52.0	0.3
2001	363.3	165.8	153.9	238.4	46.9	0.3
2002	367.3	182.3	152.9	233.4	38.2	0.2
2003	375.8	241.4	169.2	238.1	34.0	0.3
2004	372.7	217.4	163.0	238.0	53.5	0.4
2005	363.1	127.7	149.1	243.9	48.3	0.6
2006	366.3	214.6	159.4	240.0	40.7	0.5
2007	371.8	188.1	147.5	245.5	50.4	0.7
2008	351.4	139.3	150.8	240.5	60.9	0.9
2009	334.8	150.1	134.6	246.6	45.3	1.0
2010	354.1	186.3	148.7	238.8	45.9	1.1
2011	338.0	145.2	130.0	242.9	44.2	1.7
2012	329.1	122.7	115.0	240.7	60.0	1.8
2013	322.2	151.3	106.9	247.3	45.6	2.8
2014	313.1	126.2	95.6	247.0	47.7	4.0
2015	316.7	102.6	82.4	243.6	59.7	8.4
2016	323.3	127.1	72.9	243.1	56.3	11.0
2017*	314.2	116.3	66.1	235.4	52.7	17.3
Share						
2017*	23%	9%	5%	17%	4%	1.3%
Annual Change						
16/17*	–3%	–8%	–9%	–3%	–6%	57%

Wood fuels	Peat	Others	Net imports of electricity	Total	
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
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
267.9	63.3	15.4	42.8	**1 316.3**	2000
261.5	88.0	17.2	35.9	**1 371.0**	2001
282.7	93.4	17.9	42.9	**1 411.3**	2002
287.8	102.7	20.0	17.5	**1 486.9**	2003
302.0	91.8	21.7	17.5	**1 478.0**	2004
280.9	70.9	23.5	61.3	**1 369.3**	2005
315.1	95.5	23.1	41.0	**1 496.5**	2006
302.3	104.8	25.5	45.2	**1 481.5**	2007
308.0	84.1	30.2	46.0	**1 412.0**	2008
272.1	74.8	32.2	43.5	**1 335.0**	2009
323.7	97.8	35.3	37.8	**1 469.4**	2010
318.4	85.6	36.7	49.9	**1 392.7**	2011
332.1	66.4	44.6	62.8	**1 375.0**	2012
338.5	57.6	50.0	56.6	**1 378.9**	2013
339.4	61.1	53.8	64.7	**1 352.5**	2014
330.9	57.8	53.0	58.8	**1 313.8**	2015
349.1	56.2	60.2	68.2	**1 367.3**	2016
361.4	53.6	62.7	73.5	**1 353.2**	2017*
					Share
27%	4%	5%	5%	**100%**	2017*
					Annual Change
4%	–5%	4%	8%	**–1%**	16/17*

Renewable energy, PJ

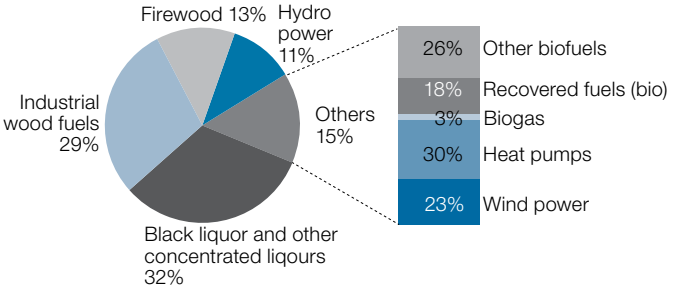
	Hydro power	Wind power	Wood fuels in industry and energy production	Black liquor and others	Small combustion of wood	Heat pumps	Others	Total	Share of total energy consumption, %
1970	33.9	–	20.2	57.7	92.2	..	..	**204.0**	28
1980	36.4	–	31.1	67.4	43.6	0.4	..	**178.9**	19
1990	38.7	0.0	36.5	86.1	44.7	1.2	0.3	**207.4**	18
2000	52.0	0.3	84.7	137.9	45.3	1.5	3.5	**325.2**	25
2005	48.3	0.6	95.0	132.1	53.8	2.3	7.4	**339.5**	25
2006	40.7	0.5	103.6	156.0	55.5	3.1	6.8	**366.3**	24
2007	50.4	0.7	93.2	153.1	56.0	3.8	8.1	**365.2**	25
2008	60.9	0.9	103.7	143.7	60.6	6.5	12.6	**388.9**	28
2009	45.3	1.0	97.7	110.2	64.3	8.9	16.4	**343.8**	26
2010	45.9	1.1	116.4	135.7	71.7	10.4	17.7	**398.7**	27
2011	44.2	1.7	122.4	135.1	60.9	12.0	20.0	**396.4**	28
2012	60.0	1.8	130.2	135.8	66.1	15.7	22.0	**431.5**	31
2013	45.6	2.8	136.3	140.7	61.5	16.1	25.2	**428.2**	31
2014	47.7	4.0	135.2	141.9	62.3	17.8	37.3	**446.2**	33
2015	59.7	8.4	130.5	142.1	58.4	17.3	38.4	**454.7**	35
2016	56.3	11.0	140.2	146.3	62.6	21.3	27.2	**464.9**	34
2017*	52.7	17.3	143.6	155.3	62.5	22.8	36.6	**490.8**	36

Share of renewable energy in total energy consumption (1970–2017*) and gross final energy consumption (2004–2017*), and target for 2020



Share of renewable energy in gross final energy consumption in 2016 was 39% and the preliminary estimate for 2017 is 40.5%.

Renewable energy 2017*

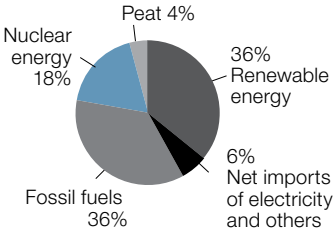


The divisions of the group Others are partly based on data for 2016.

The total consumption of renewable energy in 2017* was 491 PJ which is 36% of total energy consumption.

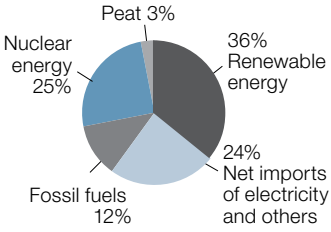
Renewable energy 2017*

In total energy consumption



Total 1 353 PJ

In electricity supply



Total 85 TWh

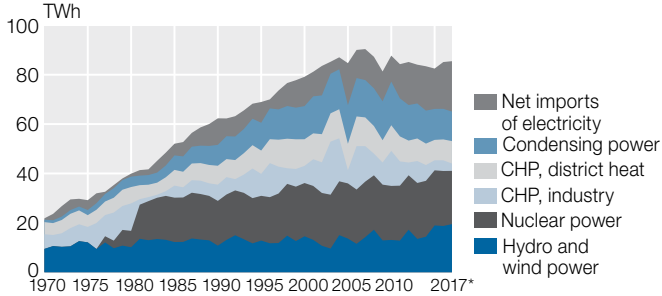
Supply and total consumption of electricity, TWh

	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**
1990	10.8	0.0	18.1	6.6	7.7	8.5	10.7	**62.3**
1995	12.8	0.0	18.1	8.9	9.5	11.3	8.4	**68.9**
2000	14.5	0.1	21.6	6.9	10.8	13.4	11.9	**79.2**
2001	13.0	0.1	21.9	10.8	10.5	15.0	10.0	**81.2**
2002	10.6	0.1	21.4	12.4	11.4	15.7	11.9	**83.6**
2003	9.5	0.1	21.8	21.5	11.5	16.0	4.9	**85.2**
2004	14.9	0.1	21.8	17.4	11.8	16.2	4.9	**87.1**
2005	13.4	0.2	22.4	5.3	10.7	15.6	17.0	**84.7**
2006	11.3	0.2	22.0	17.6	12.0	15.5	11.4	**90.0**
2007	14.0	0.2	22.5	14.4	11.6	15.1	12.6	**90.4**
2008	16.9	0.3	22.0	8.8	11.2	15.3	12.8	**87.3**
2009	12.6	0.3	22.6	9.0	9.0	15.8	12.1	**81.3**
2010	12.7	0.3	21.9	14.2	10.4	17.7	10.5	**87.7**
2011	12.3	0.5	22.3	9.8	10.1	15.4	13.9	**84.3**
2012	16.7	0.5	22.1	5.2	8.9	14.4	17.4	**85.2**
2013	12.7	0.8	22.7	8.9	9.1	14.2	15.7	**84.1**
2014	13.2	1.1	22.6	6.4	8.7	13.4	18.0	**83.4**
2015	16.6	2.3	22.3	4.1	8.3	12.5	16.3	**82.5**
2016	15.6	3.1	22.3	4.3	8.5	12.4	19.0	**85.2**
2017*	14.6	4.8	21.6	3.0	9.1	12.0	20.4	**85.5**
Share								
2017*	17%	6%	25%	3%	11%	14%	24%	**100%**
Annual Change								
16/17*	–6%	56%	–3%	–31%	7%	–4%	8%	**0%**

1) Wind Power also includes the production of solar power (27 GWh in 2017)
2) Condensing power includes conventional condensing power, peak gas turbine power and gas engines.

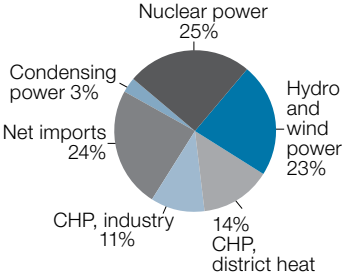
Sources: Statistics Finland, Technical Research Centre of Finland VTT (wind power)

Electricity supply 1970–2017*

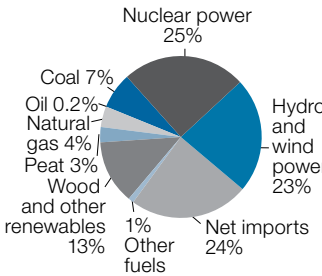


Electricity supply 2017*

By mode of production



By source



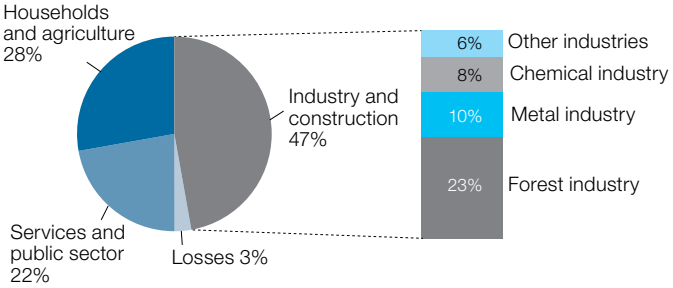
Total electricity supply in 2017* was 85.5 TWh

Electricity consumption by sector, TWh

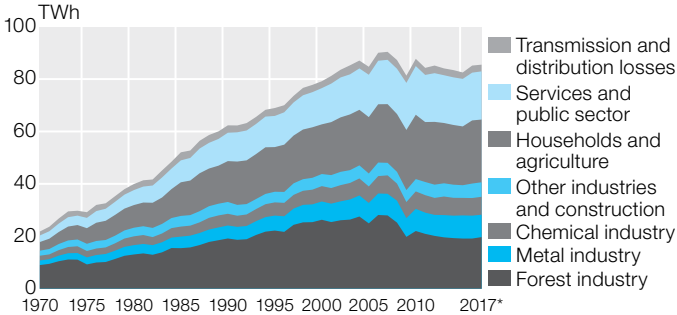
	Industry and construction					Households and agriculture	Services and public sector	Transm. and distrib. losses	Total
	Total	Forest industry	Metal industry	Chemical industry	Others				
1970	14.5	9.0	1.8	1.8	1.9	3.3	2.5	1.5	**21.8**
1975	17.1	9.2	2.7	2.4	2.7	6.0	3.9	2.2	**29.2**
1980	23.3	13.0	3.6	3.4	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**
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	**83.6**
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	**87.1**
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	25.2	8.4	6.5	4.5	22.1	17.3	3.3	**87.3**
2009	37.6	19.8	7.2	6.1	4.6	23.0	18.0	2.8	**81.3**
2010	41.8	22.0	8.5	6.7	4.7	24.6	18.6	2.8	**87.7**
2011	40.7	20.9	8.1	6.7	5.0	22.9	18.0	2.7	**84.3**
2012	39.7	20.1	8.0	6.5	5.1	24.0	18.6	2.9	**85.2**
2013	40.2	19.6	8.5	7.1	5.0	23.0	18.2	2.6	**84.1**
2014	39.7	19.3	8.6	6.8	5.0	22.8	18.2	2.8	**83.4**
2015	39.5	19.1	8.8	6.7	4.8	22.4	18.2	2.4	**82.5**
2016	40.1	19.1	8.7	6.7	5.5	24.1	18.2	2.7	**85.2**
2017*	40.6	19.7	8.5	6.8	5.5	23.9	18.4	2.6	**85.5**
Share									
2017*	47%	23%	10%	8%	6%	28%	22%	3%	**100%**
Annual Change									
16/17*	1%	3%	–2%	2%	0%	–1%	1%	–5%	**0%**

Sources: Finnish Energy Industries and Statistics Finland

Electricity consumption by sector 2017*



Electricity consumption by sector 1970–2017*



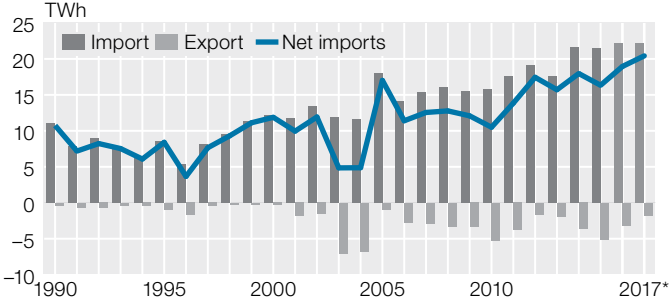
Energy sources in electricity generation, PJ

	Hydro power	Nuclear energy	Hard coal	Oil	Natural gas	Peat	Other fuels	Net imports of electr.	Total	CO_2 emissions (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	50.4	42.8	**504.2**	12
2005	49.0	243.9	37.5	3.2	47.1	25.4	60.9	61.3	**528.2**	11
2006	41.3	240.0	119.8	3.3	58.3	42.9	68.8	41.0	**615.4**	21
2007	51.1	245.5	97.1	3.0	45.2	46.3	62.3	45.2	**595.6**	19
2008	61.8	240.5	54.1	3.7	47.4	31.3	66.0	46.0	**551.0**	13
2009	46.3	246.6	74.2	3.3	40.9	24.5	50.7	43.5	**530.0**	13
2010	47.0	238.8	103.2	2.7	46.9	38.5	66.0	37.8	**580.9**	18
2011	46.0	242.9	64.6	2.6	39.9	33.6	70.1	49.9	**549.6**	13
2012	61.8	240.7	41.8	2.2	27.8	19.5	64.8	62.8	**521.5**	9
2013	48.4	247.3	72.3	1.7	27.8	17.6	70.1	56.6	**541.8**	11
2014	51.7	247.0	49.6	1.7	22.4	18.8	67.8	64.7	**523.7**	9
2015	68.1	243.6	28.7	1.4	20.8	16.3	65.6	58.8	**503.2**	7
2016	67.4	243.1	38.7	1.4	15.1	14.7	65.7	68.2	**514.3**	8
2017*	70.1	235.4	35.2	1.2	13.7	13.7	61.8	73.5	**504.6**	6

Wind power and solar power are included in hydro power.

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

Imports and exports of electricity 1990–2017*



Source: Finnish Energy Industries

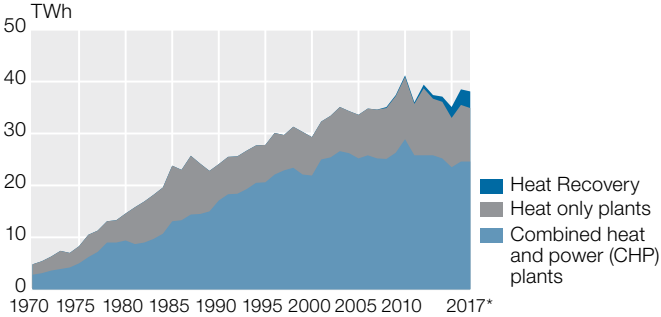
Production and consumption of district heat, TWh

	Net production of district heat			Net-work and meas-uring losses	Consumption of district heat			
	Heat only plants[1)]	CHP plants	Total		Residen-tial build-ings	Industrial buildings	Other consum-ers	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**
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	21.9	**29.2**	3.0	14.9	2.6	8.8	**26.3**
2001	7.3	25.0	**32.3**	3.1	16.2	2.9	10.1	**29.2**
2002	8.0	25.4	**33.4**	3.4	16.6	3.0	10.4	**30.0**
2003	8.5	26.6	**35.0**	3.8	17.6	3.0	10.6	**31.2**
2004	8.1	26.2	**34.3**	4.0	17.0	2.9	10.3	**30.3**
2005	8.4	25.2	**33.6**	3.8	16.6	3.0	10.2	**29.8**
2006	9.0	25.8	**34.7**	4.1	17.1	3.1	10.5	**30.7**
2007	9.4	25.2	**34.6**	3.8	17.3	3.1	10.4	**30.8**
2008	10.0	25.1	**35.1**	4.4	17.2	3.0	10.6	**30.7**
2009	11.0	26.3	**37.4**	3.7	18.2	3.4	12.1	**33.7**
2010	12.3	28.9	**41.2**	4.1	20.2	3.7	13.2	**37.2**
2011	10.3	25.8	**36.0**	3.5	17.6	3.3	11.6	**32.5**
2012	13.6	25.8	**39.4**	3.9	19.3	3.6	12.5	**35.4**
2013	11.6	25.8	**37.4**	3.7	18.6	3.3	11.9	**33.8**
2014	11.9	25.2	**37.1**	3.8	18.3	3.3	11.8	**33.4**
2015	11.6	23.5	**35.1**	3.6	18.0	3.1	10.4	**31.5**
2016	13.9	24.6	**38.5**	4.0	19.6	3.4	11.5	**34.5**
2017*	13.5	24.6	**38.1**	3.9	19.5	3.4	11.3	**34.2**

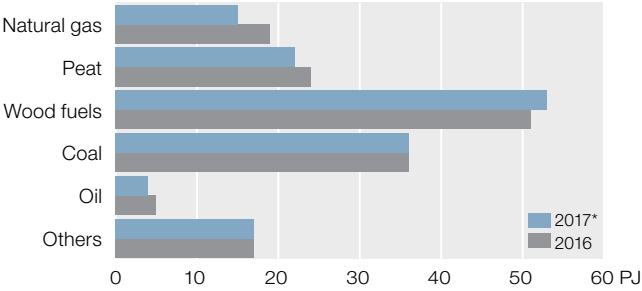
1) Heat only plants include fuel-powered heating plants and heat recovery for example from heat pumps, flue gas scrubbers and condenser.

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

Production of district heat 1970–2017*

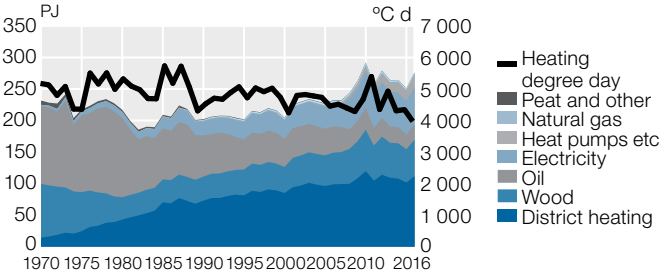


Fuel consumption in production of district heat 2016–2017*

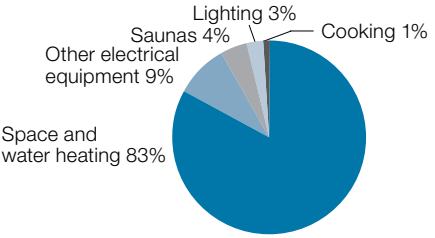


Sources: Statistics Finland, Finnish Energy Industries

Consumption of energy for heating residential, commercial and public buildings 1970–2016

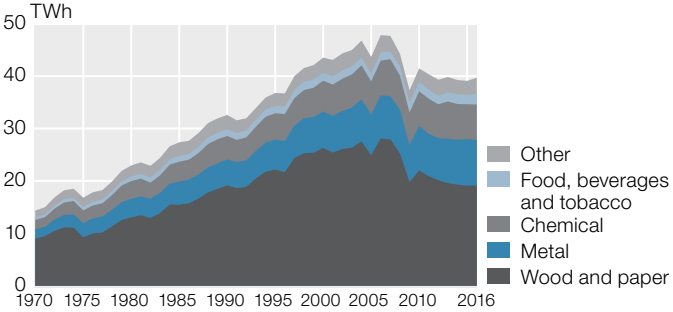


Energy consumption in households 2016

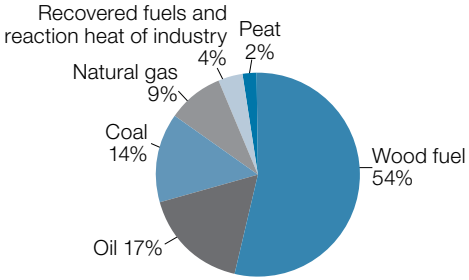


Energy consumption in households in 2016 was 239 PJ.

Electricity consumption by branch of industry 1970–2016



Fuel consumption in industry 2016

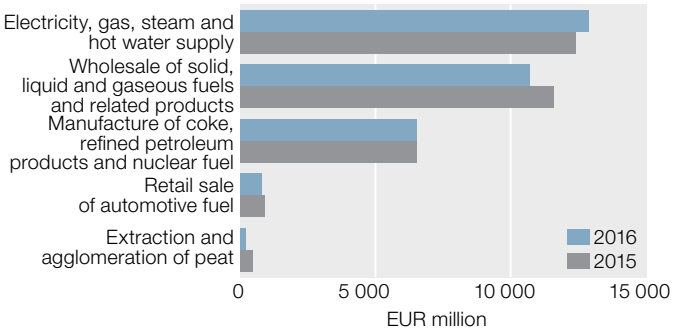


Total fuel consumption in industry in 2016 was 367 PJ.

Enterprises in energy sector in 2016

	Number of enterprises	Turnover, EUR mil.	Employees	Staff expenses, EUR mil.
Extraction and agglomeration of peat	417	214	970	35
Manufacture of coke, refined petroleum products and nuclear fuel	16	6 546	2 562	218
Electricity, gas, steam and hot water supply	919	12 877	12 041	843
Wholesale of solid, liquid and gaseous fuels and related products	131	10 703	998	79
Retail sale of automotive fuel	688	810	3 454	111

Turnover of enterprises in energy sector 2015–2016



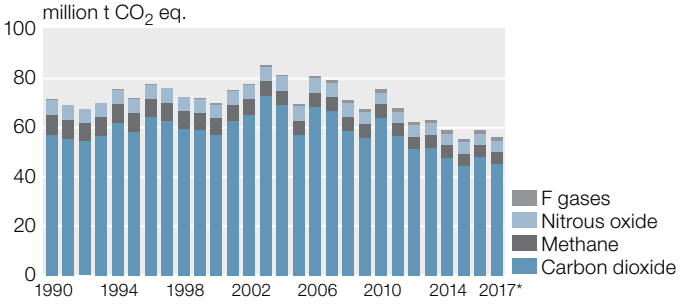
Source: Statistics Finland, Financial statements of enterprises.

Greenhouse gas emissions 1990–2017*

The gases included in the Kyoto Protocol

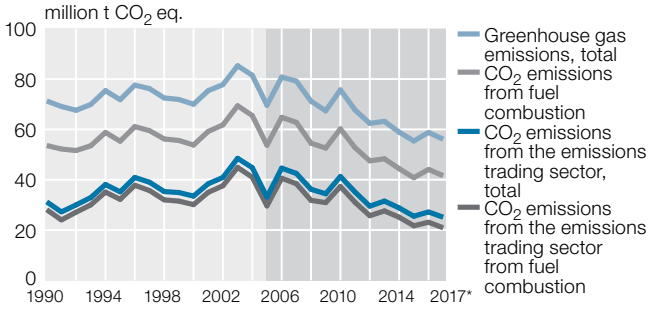
	1990	1995	2000	2005	2010	2014	2015	2016	2017*
	million tonnes of CO_2 equivalent								
Energy	53,6	55,3	53,8	53,7	60,2	44,5	40,8	44,1	41,6
Industrial prosesses and product use	5,4	4,9	5,8	6,7	6,1	5,6	5,9	6,1	6,1
Agriculture	7,5	6,8	6,5	6,5	6,6	6,5	6,5	6,5	6,5
Waste	4,7	4,6	3,9	2,8	2,6	2,2	2,1	2,0	1,9
Indirect CO_2 emissions from energy and industrial prosesses and product use	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Total emission without land use, land use change and forestry	**71,3**	**71,8**	**70,0**	**69,8**	**75,5**	**58,9**	**55,4**	**58,8**	**56,1**
Land use, land use change and forestry	–12,7	–12,4	–21,7	–27,7	–27,5	–28,3	–28,8	–27,1	–27,1

Greenhouse gas emissions by gases 1990–2017*



Source: Statistics Finland, Greenhouse Gas Inventory

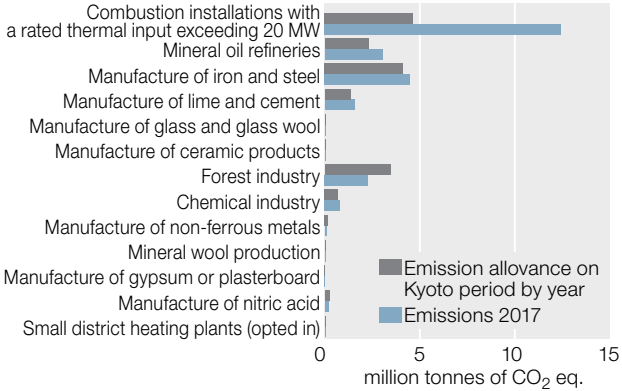
Finland's greenhouse gas emissions 1990–2017*



The EU's emissions trading started in 2005.

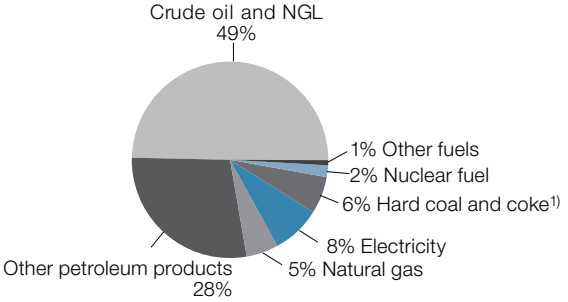
Source: Statistics Finland, Greenhouse Gas Inventory

National allowances under EU ETS and verified CO_2 emissions for 2017 by branch in Finland



Source: European Commission

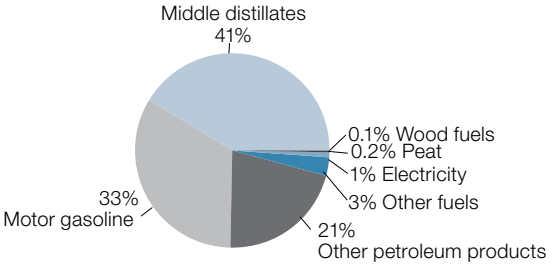
Value of energy imports 2017*



1) includes coking coal

Total imports of energy products were 8 818 million euros in 2017*.
That was 14.2% of total imports to Finland.

Value of energy exports 2017*



Total exports of energy products were 4 719 million euros in 2017*.
That was 7.9% of total exports from Finland.

Source: Finnish Customs/Foreign Trade Statistics

Energy imports 2017*

	Unit	Russia	Sweden	Norway	Other countries	Total Amount	Total Value mil. €
Coal and coal products	1000 t	2 606	0	–	1 528	**4 154**	**526**
Natural gas	mil. m^3	2 199	–	–	0	**2 199**	**436**
Oil and petroleum products [1]	1000 t	12 991	1 979	1 413	1 609	**17 993**	**6 956**
Peat	1000 t	19	4	–	4	**26**	**1**
Wood fuels [2]	1000 t	86	0	–	1	**87**	**9**
Nuclear fuel	tU	21	18	–	17	**56**	**151**
Electricity	TWh	6	15	0	1	**22**	**718**
Value	**€ mil.**	**5 350**	**1 579**	**602**	**1 618**		**8 818**

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

Source: Finnish Customs/ Foreign Trade Statistics

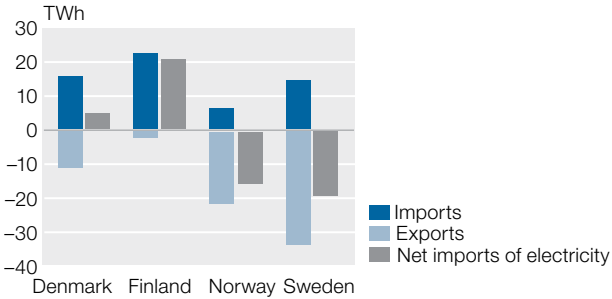
Energy exports 2017*

	Unit	Netherlands	Sweden	United Kingdom	Other countries	Total Amount	Total Value mil. €
Coke [1]	1000 t	58	–	–	81	**138**	**25**
Petroleum products	1000 t	1 635	1 577	1 171	4 465	**8 847**	**4 617**
Peat	1000 t	2	2	0	47	**50**	**8**
Wood fuels [2]	1000 t	–	15	–	23	**37**	**4**
Electricity	TWh	–	0	–	2	**2**	**55**
Value	**€ mil.**	**686**	**1 123**	**534**	**2 377**		**4 719**

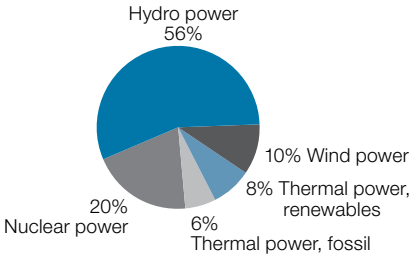
1) Includes coke tar
2) Includes wood pellets and other wood fuels

Source: Finnish Customs/ Foreign Trade Statistics

Imports and exports of electricity in Nordic countries 2017



Total electricity generation in Nordic Countries 2017



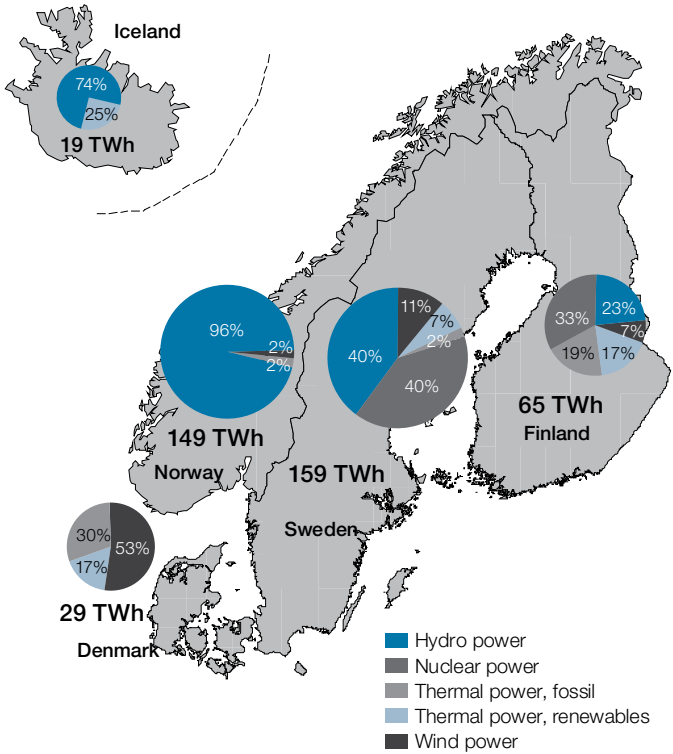
Total generation 421 TWh

Electricity consumption in Nordic Countries 2017, TWh

Sweden	140
Norway	133
Finland	85
Denmark	34
Iceland	19
Total	**412**

Source: Entso-e: Monthly Statistics 2017

Electricity generation in Nordic Countries 2017

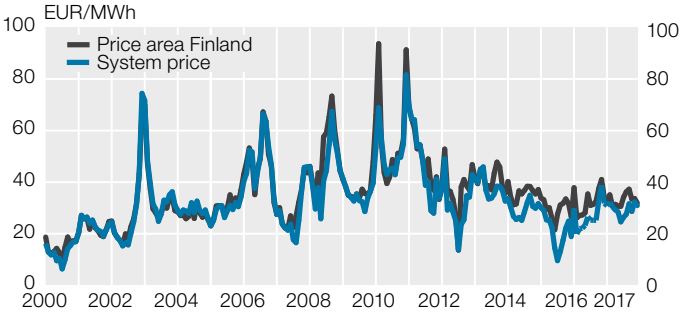


Source: Entso-e: Monthly Statistics 2017

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

Year	Month	Oslo	Stockholm	Helsinki	Copenhagen	Tallinn	System
2017	1	31.29	31.93	33.29	33.55	33.27	30.81
	2	31.83	33.10	35.07	32.61	35.13	32.28
	3	30.96	30.39	30.68	29.76	30.66	30.40
	4	29.86	28.88	31.40	28.90	31.18	29.23
	5	28.03	29.58	30.67	29.61	30.66	28.46
	6	23.52	27.03	30.64	29.04	30.65	24.61
	7	26.18	30.83	34.17	31.94	34.33	26.37
	8	26.80	33.63	36.28	34.30	36.34	27.58
	9	30.17	36.46	37.27	38.49	37.27	31.59
	10	27.62	30.60	33.42	31.69	33.43	28.65
	11	31.33	31.96	33.67	34.68	33.70	32.27
	12	31.07	30.63	31.92	29.18	32.02	30.92
2018	1	32.41	32.39	37.08	31.57	37.11	32.93

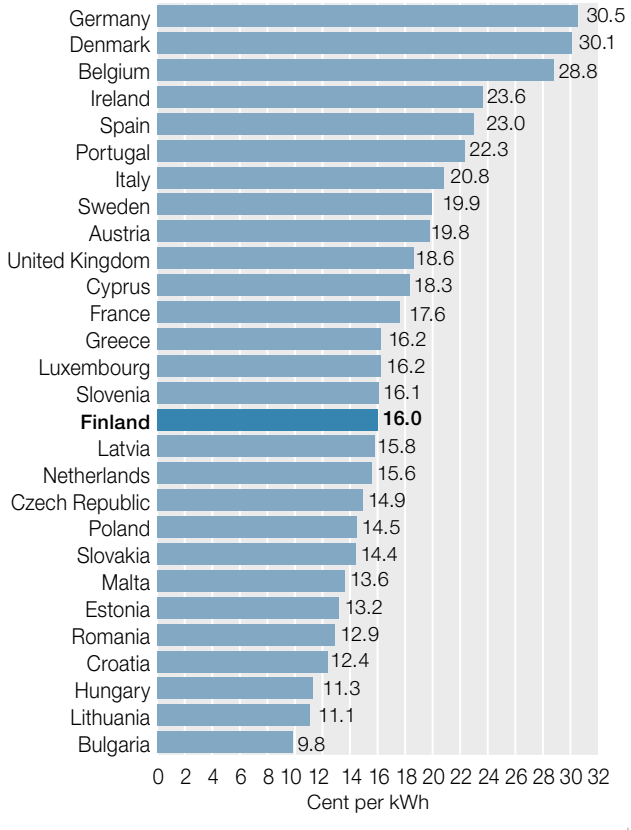
Development of spot prices on Nord Pool



The system price is the price calculated on the basis of all bids and offers at the Power Exchange, in which possbile restrictions caused by the electricity transmission capacity are not taken into account.

Source: Nord Pool

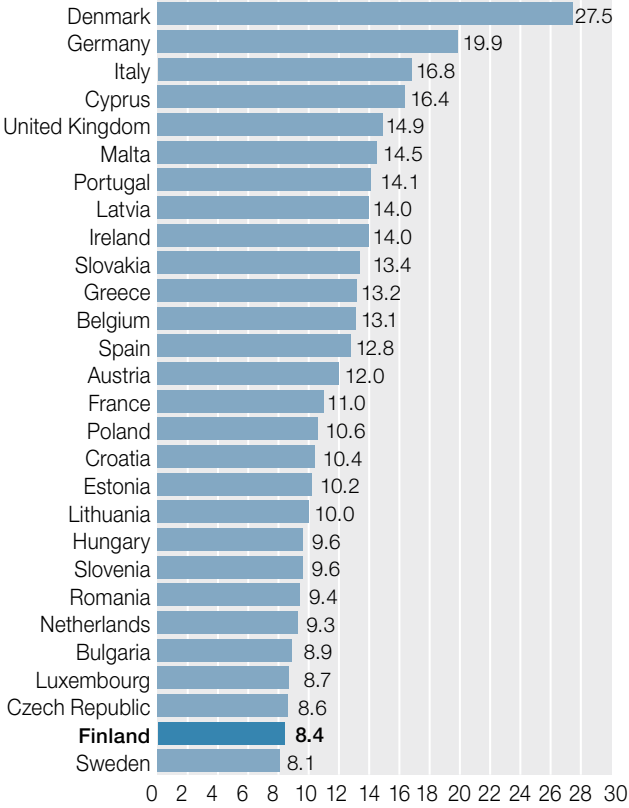
Electricity prices for households on the 2nd half of 2017



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

Source: Eurostat

Electricity prices for industry on the 2nd half of 2017



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

Source: Eurostat

Total energy consumption in EU, PJ

	1985	1990	1995	2000	2005	2010	2015	2016
Germany	15 040	14 917	14 304	14 333	14 316	13 921	13 145	13 283
France	8 540	9 530	10 116	10 776	11 568	11 186	10 596	10 414
United Kingdom	8 530	8 819	9 305	9 653	9 804	8 909	8 034	7 931
Italy	5 590	6 427	6 773	7 294	7 958	7 449	6 538	6 479
Spain	3 170	3 771	4 274	5 177	6 038	5 453	5 084	5 115
Poland	..	4 326	4 138	3 711	3 861	4 215	4 004	4 184
Netherlands	2 550	2 870	3 154	3 259	3 518	3 594	3 239	3 288
Belgium	1 840	2 034	2 254	2 483	2 473	2 550	2 272	2 405
Sweden	1 960	1 986	2 155	2 047	2 136	2 126	1 908	2 061
Czech Republic	..	2 097	1 756	1 732	1 902	1 902	1 778	1 749
Finland	**990**	**1 208**	**1 229**	**1 357**	**1 445**	**1 553**	**1 393**	**1 449**
Austria	1 120	1 048	1 135	1 215	1 425	1 428	1 398	1 418
Romania	..	2 432	1 939	1 534	1 641	1 499	1 358	1 357
Hungary	990	1 208	1 096	1 059	1 177	1 114	1 054	1 076
Greece	..	935	999	1 185	1 315	1 202	1 024	1 011
Portugal	520	762	864	1 059	1 150	1 017	964	974
Belgium	..	1 158	950	776	827	744	775	759
Denmark	820	749	846	826	818	839	706	729
Slovakia	..	912	742	766	797	748	688	691
Ireland	370	430	463	604	638	636	594	622
Croatia	..	399	329	353	410	395	357	359
Lithuania	..	666	362	296	365	284	289	295
Slovenia	..	239	254	270	307	307	275	285
Estonia	..	408	230	208	235	257	264	260
Latvia	..	332	194	162	192	194	183	184
Luxembourg	130	147	139	153	201	194	175	176
Cyprus	..	67	82	101	106	115	95	102
Malta	..	24	32	34	39	39	32	30
EU 28	..	**69 903**	**70 113**	**72 423**	**76 663**	**73 872**	**68 222**	**68 688**

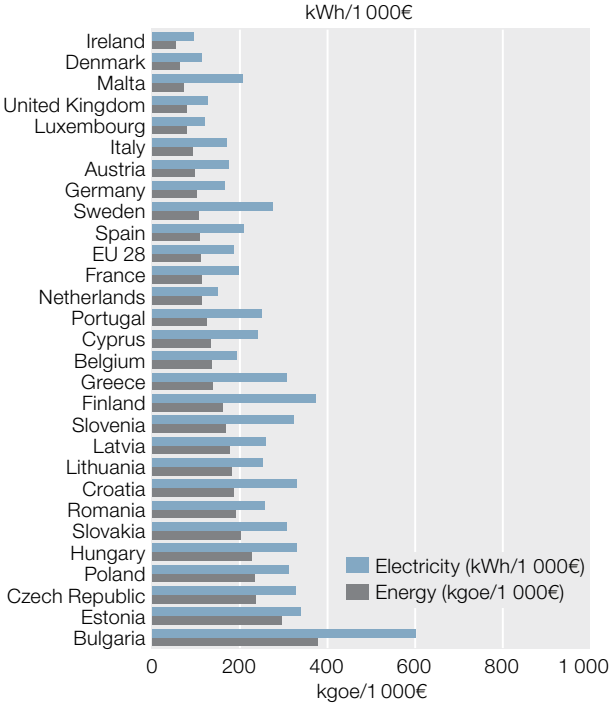
Source: Eurostat

Electricity consumption in EU, TWh

	1985	1990	1995	2000	2005	2010	2015	2016
Germany	425	455	451	483	522	532	515	517
France	253	302	343	384	422	444	434	441
United Kingdom	242	274	295	330	349	329	304	304
Italy	174	215	238	273	301	299	287	286
Spain	103	126	141	188	242	245	232	233
Poland	92	96	90	98	105	119	128	133
Sweden	114	120	125	129	131	131	125	127
Netherlands	61	72	82	96	104	107	104	105
Belgium	48	58	68	78	80	83	82	82
Finland	**49**	**59**	**65**	**76**	**81**	**83**	**78**	**81**
Austria	37	43	47	52	57	60	61	62
Czech Republic	43	48	48	49	55	56	57	58
Greece	24	28	34	43	51	53	51	53
Portugal	17	24	29	38	46	50	46	46
Romania	..	54	40	34	39	41	43	44
Hungary	30	32	28	29	32	34	37	38
Denmark	25	28	31	32	33	32	31	31
Bulgaria	..	35	29	24	26	27	28	29
Ireland	21	12	15	20	24	25	26	26
Slovakia	10	25	22	22	23	24	24	25
Croatia	0	13	10	12	14	16	15	15
Slovenia	..	9	9	11	13	12	13	13
Lithuania	..	12	6	6	8	8	9	10
Estonia	..	7	5	5	6	7	7	7
Latvia	..	8	4	4	6	6	6	6
Luxembourg	4	4	5	6	6	7	6	6
Cyprus	..	2	2	3	4	5	4	4
Malta	..	1	1	2	2	2	2	2
EU 28	**1 772**	**2 164**	**2 263**	**2 529**	**2 784**	**2 840**	**2 755**	**2 786**

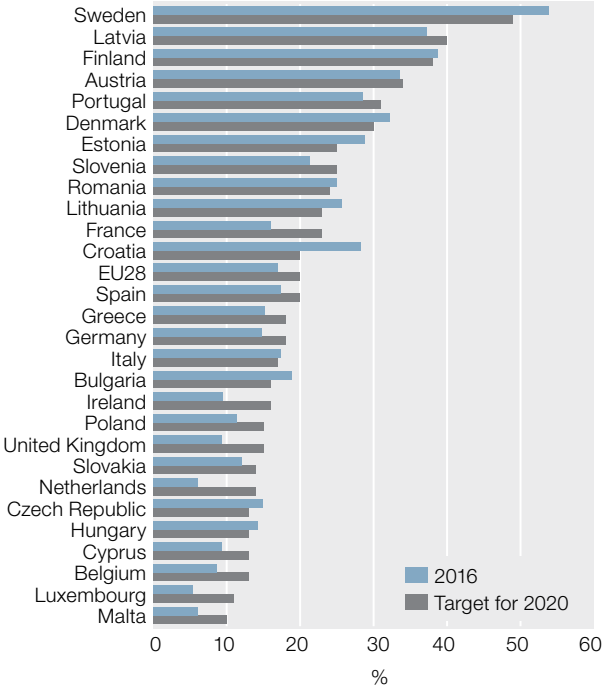
Source: Eurostat

Consumption of energy and electricity per GDP-unit in EU countries 2016



Source: Eurostat

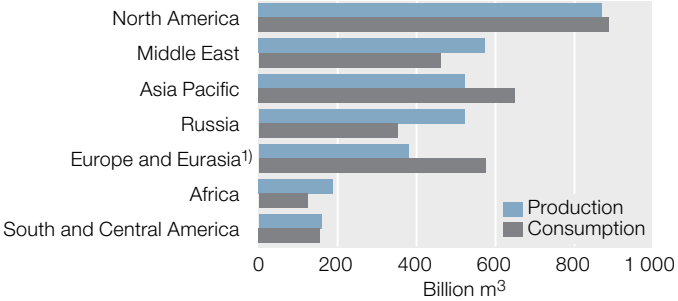
Share of renewable energy in gross final energy consumption in 2016, and the target for 2020



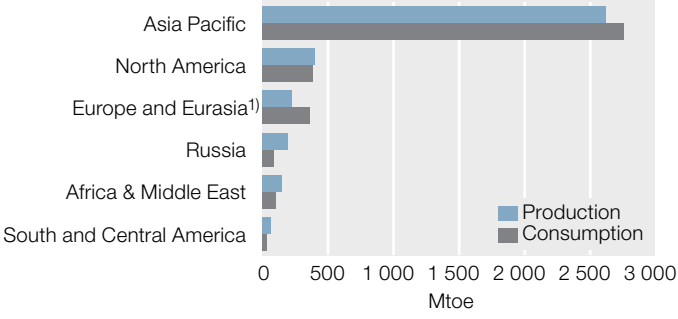
This indicator is calculated on the basis of data covered by Regulation (EC) No 1099/2008 on energy statistics. Reporting countries provide additional information on renewable source not covered by the Regulation. This indicator may be considered an estimate of the indicator described in Directive 2009/28/EC 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 2016



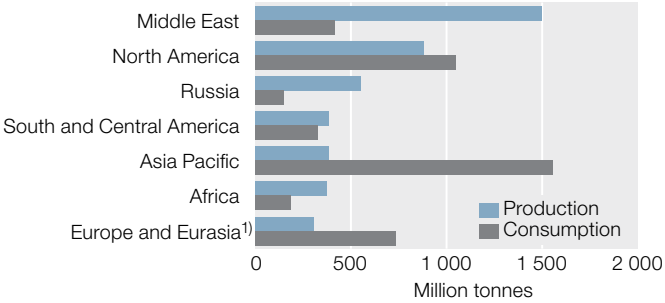
Coal production and consumption by region in 2016



1) excludes Russia

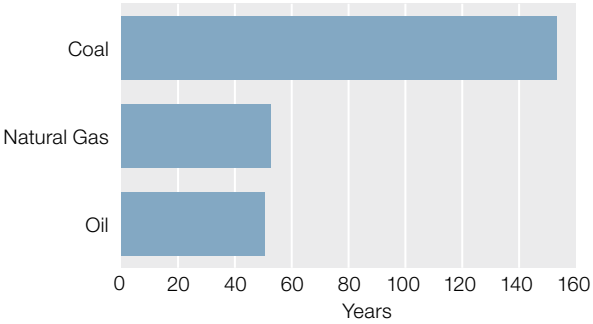
Source: BP Statistical Review of World Energy 2017

Oil production and consumption by region in 2016



1) excludes Russia

World oil, natural gas and coal reserve sufficiency



Total reserves at the end of 2016: oil 241 billion tonnes, natural gas 187 trillion m^3, coal 1 139 billion tonnes.

Source: BP Statistical Review of World Energy June 2017

Electricity network information

	1990	2000	2014	2015	2016
Transformer substations, number					
High voltage substations	715	591	946	944	970
Distribution substations	114 019	124 851	133 512	136 417	136 753
Lengths of low voltage lines (0.4 kV–1 kV), km					
Overhead lines	162 076	158 576	141 971	139 243	134 814
Cables (inc. sea cable)	45 705	63 327	97 924	102 746	107 978
Cabling rate	22%	29%	41%	42%	44%
Lengths of medium voltage lines (over 1 kV–70 kV), km					
Overhead lines	122 329	121 754	117 927	115 967	113 033
Cables (inc. sea cable)	10 586	12 116	23 161	27 144	32 786
Cabling rate	8%	9%	16%	19%	22%
Lengths of high voltage lines (110 kV–400 kV), km					
110 kV	14 000	15 050	16 136	16 231	16 495
220 kV	2 471	2 510	2 225	2 092	2 092
400 kV	3 164	3 926	5 191	5 191	5 401

Source: Energy Authority

Energy statistics by Statistics Finland

Energy table service

The Energy table service provides information on the energy industry as an extensive compilation of Excel tables and statistical graphs. The service is available in Finnish, English or Swedish, and is updated annually. The Energy online service is available at http://pxhopea2.stat.fi/sahkoiset_julkaisut/energia2017/.

Energy in Finland

Statistical pocketbook on energy statistics.

Homepage of the Energy topic 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 GJ	Net heat content MWh	Density t/m^3
Crude oil	t	41.8	11.6	0.86
Heavy fuel oil	t	40.4	11.2	0.99
Light fuel oil	t	43.0	11.9	0.84
Diesel fuel	t	43.0	11.9	0.83
Kerosenes	t	43.3	12.0	0.79
Other kerosines	t	43.1	12.0	0.83
Naphtha	t	44.3	12.3	0.70
Motor gasolines	t	42.0	11.7	0.75
Aviation gasolines	t	43.7	12.1	0.71
LPG	t	46.3	12.9	0.52
Refinery gases	t	50.0	13.9	
Hard coal	t	25.0	6.9	
Coke	t	29.3	8.1	
Natural gas	1 000 m^3 (0°C)	36.5	10.1	
Blast furnace gas	1 000 m^3	3.8	1.1	
Coke oven gas	1 000 m^3	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 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	= 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	69.6	Default bio share 7%
Diesel fuel	66.3	Default bio share 10%
Light fuel oil	73.5	
Heavy fuel oil	79.2	
Kerosenes	73.2	
LPG	64.9	
Other oils	71,3–79,2	
Hard coal	93.3	
Coke	107.0	
Natural gas	55.3	
Milled peat	107	
Bark, wood fuel	109.6	
Industrial wood residue	109.6	
Black liquor	109.6	

Source: Statistics Finland/Fuel classification 2017
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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