Statistics Finland

ENERGY IN FINLAND
2019

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 2018

Town	Latitude	January	July
Helsinki	60°	–1.2°C	21.1°C
Sodankylä	67°	–11.7°C	20.1°C

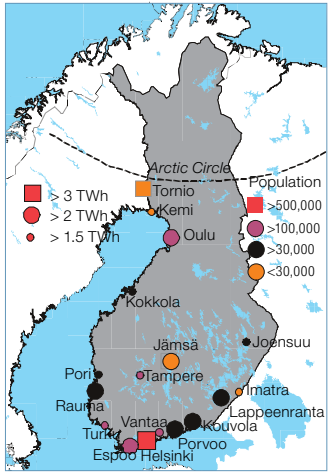
Economy

In 2018* GDP totalled € 233.6 bil., i.e. € 42,340/capita. In 2018* services were 69.1%, secondary production 28.2% and primary production 2.8% of the GDP.

Structure of industry, Value added gross in production in 2018*

	bil. €	%
Total industry	42.5	100
Mining and quarrying	1.0	2
Forest industry	4.8	11
Chemical industry	5.9	14
Metal industry	19.4	46
Basic metals and metal prod.	4.6	11
Electrical and electronics ind.	6.7	16
Other metal industry	8.0	19
Other manufacturing ind.	5.2	13
Energy supply	4.3	10
Water supply and waste management	1.9	4

Municipalities with high electricity consumption 2017



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 2018*

1,379 PJ (32.9 Mtoe)
251 GJ/capita (6.0 toe/capita)

CO_2 emissions in energy sector in 2018*

41.5 million t CO_2
7.5 t CO_2/capita

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Statistics Finland

The data in this pocketbook are based on the Preliminary Energy Statistics 2018 figures.

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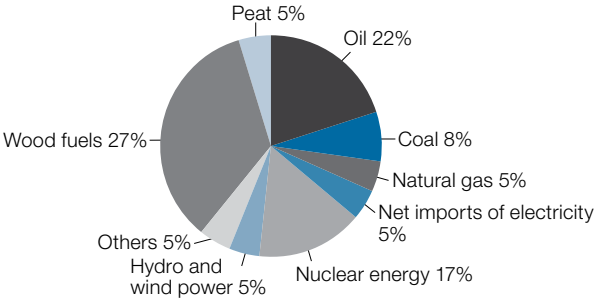
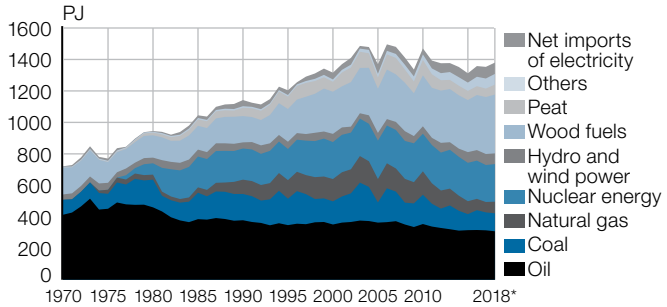
Total energy consumption by energy source 2018*



Total energy consumption in 2018* was 1 379 PJ.
Oil includes the bio part of transport fuels.

Total energy consumption by energy source 1970–2018*



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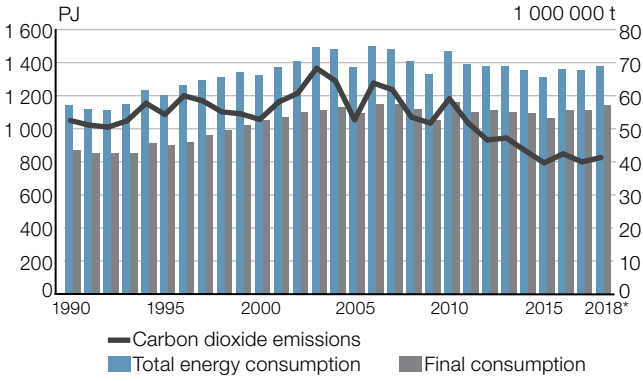
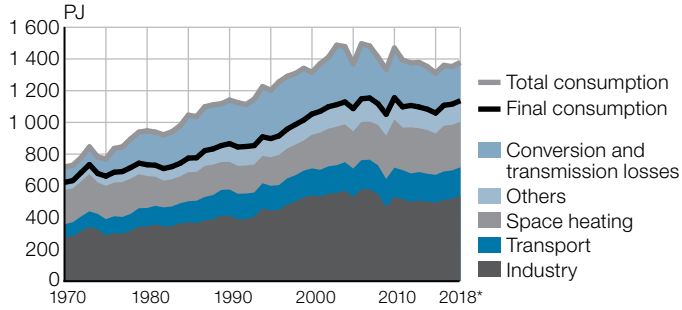
Energy consumption and carbon dioxide emissions 1990–2018*



Total energy consumption and final energy consumption by sector 1970–2018*



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	321.3	151.3	106.9	247.3	45.6	2.8
2014	312.1	126.2	95.6	247.0	47.7	4.0
2015	314.8	101.9	82.4	243.6	59.7	8.4
2016	316.3	126.5	72.2	243.1	56.3	11.0
2017	313.5	113.7	66.0	235.4	52.6	17.3
2018*	307.6	113.8	73.6	238.8	47.3	21.1
Share						
2018*	22%	8%	5%	17%	3%	1.5%
Annual Change						
17/18*	–2%	0%	12%	1%	–10%	22%

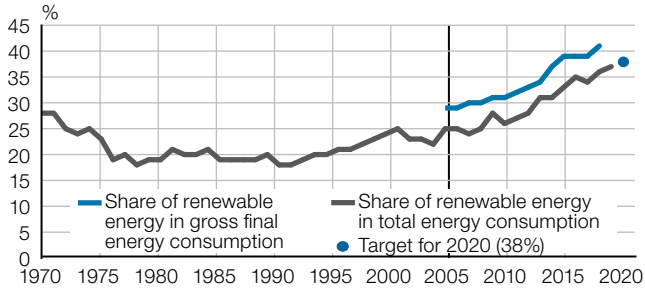
Oil includes the bio part of transport fuels.

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	**1 378.0**	2013
339.4	61.1	53.8	64.7	**1 351.6**	2014
330.9	58.0	53.0	58.8	**1 311.4**	2015
350.1	56.3	60.3	68.2	**1 360.3**	2016
362.3	53.9	64.2	73.5	**1 352.3**	2017
374.5	62.6	67.8	71.8	**1 378.8**	2018*
					Share
27%	5%	5%	5%	**100%**	2018*
3%	16%	6%	–2%	**2%**	17/18*

Renewable energy, PJ

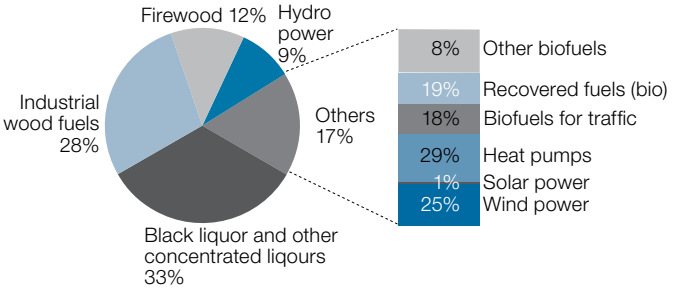
	Hydro power	Wind power	Wood fuels in industry and energy production	Black liquor and others	Small combustion of wood	Heat pumps	Others	Total	Share of total energy consumption, %
1970	33.9	–	20.2	57.7	92.2	..	..	**204.0**	28
1980	36.4	–	31.1	67.4	43.6	0.4	..	**178.9**	19
1990	38.7	0.0	36.5	86.1	44.7	1.2	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
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	37.4	**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	140.3	146.3	63.5	21.3	27.3	**466.0**	34
2017	52.6	17.3	145.3	154.8	62.3	23.0	37.3	**492.5**	36
2018*	47.3	21.1	143.6	168.2	62.7	24.6	38.8	**506.3**	37

Share of renewable energy in total energy consumption (1970–2018*) and gross final energy consumption (2004–2017), and target for 2020



Share of renewable energy in gross final energy consumption in 2017 was 41%.

Renewable energy 2018*



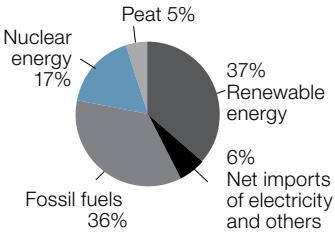
The divisions of the group Others are partly based on data for 2017.

The total consumption of renewable energy in 2018* was 506 PJ which is 37% of total energy consumption.

The figure differs from the EU target, which is calculated from final energy consumption.

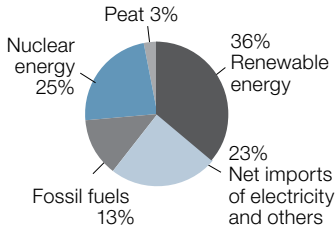
Shares of renewable energy 2018*

In total energy consumption



Total 1 379 PJ

In electricity supply



Total 87 TWh

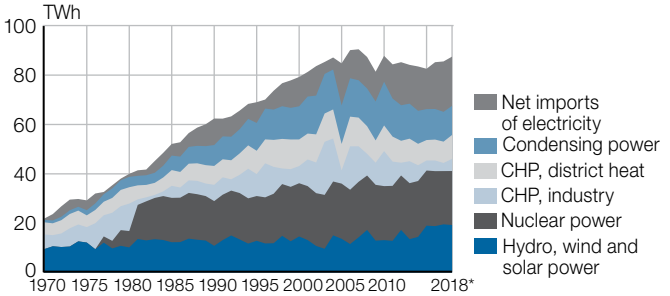
Supply and total consumption of electricity, TWh

	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	3.3	8.6	12.1	20.4	**85.5**
2018*	13.1	5.9	21.9	4.9	9.7	11.8	19.9	**87.4**
Share								
2018*	15%	7%	25%	6%	11%	13%	23%	**100%**
Annual Change								
17/18*	–10%	24%	1%	49%	12%	–2%	–2%	**2%**

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.

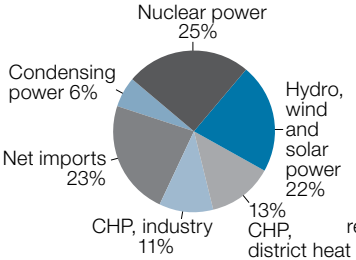
Sources: Statistics Finland, Finnish Energy Industries, Technical Research Centre of Finland VTT (wind power)

Electricity supply 1970–2018*

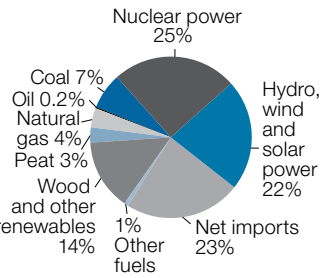


Electricity supply 2018*

By mode of production



By source



Total electricity supply in 2018* was 87.4 TWh.

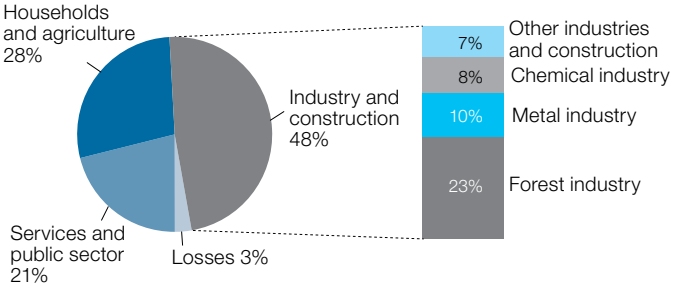
Sources: Statistics Finland, Finnish Energy Industries, Technical Research Centre of Finland VTT (wind power)

Electricity consumption by sector, TWh

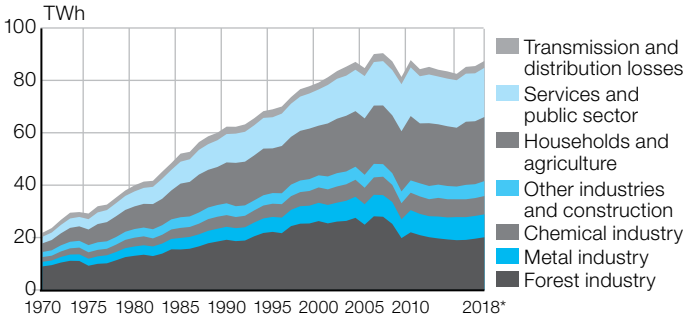
	Industry and construction					Households and agriculture	Services and public sector	Transm. and distrib. losses	Total
	Total	Forest industry	Metal industry	Chemical industry	Others				
1970	14.5	9.0	1.8	1.8	1.9	3.3	2.5	1.5	**21.8**
1975	17.1	9.2	2.7	2.4	2.7	6.0	3.9	2.2	**29.2**
1980	23.3	13.0	3.6	3.4	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	6.2	4.5	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	19.7	8.4	7.1	5.1	23.0	18.2	2.6	**84.1**
2014	39.7	19.3	8.4	6.9	5.1	22.8	18.2	2.8	**83.4**
2015	39.5	19.0	8.8	6.8	4.9	22.4	18.1	2.4	**82.5**
2016	40.1	19.1	8.7	6.8	5.5	24.1	18.4	2.6	**85.2**
2017	40.4	19.6	8.7	6.8	5.3	24.0	18.3	2.8	**85.5**
2018*	41.5	20.1	8.7	7.0	5.7	24.5	18.8	2.6	**87.4**
Share									
2018*	48%	23%	10%	8%	7%	28%	21%	3%	**100%**
Annual Change									
17/18*	3%	3%	1%	3%	7%	2%	3%	–5%	**2%**

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

Electricity consumption by sector 2018*



Electricity consumption by sector 1970–2018*



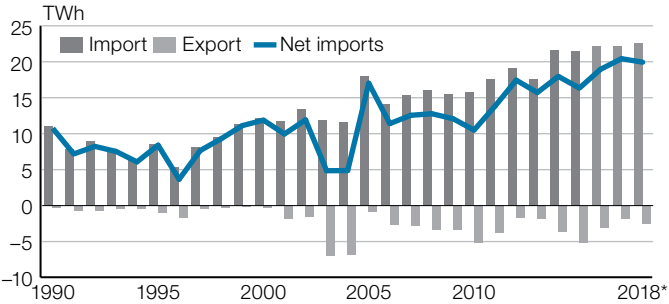
Sources: Finnish Energy Industries and Statistics Finland

Energy sources in electricity generation, PJ

	Hydro and wind 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	**503.3**	7
2016	67.4	243.1	38.7	1.4	15.1	14.8	65.6	68.2	**514.3**	8
2017	70.0	235.4	29.7	1.2	13.3	13.7	68.8	73.5	**505.5**	7
2018*	68.4	238.8	37.7	1.5	18.7	16.9	69.2	71.8	**522.9**	7

Solar power is included in hydro and wind power.
Sources: Statistics Finland, Finnish Energy Industries and Technical Research Centre of Finland VTT (wind power)

Imports and exports of electricity 1990–2018*



Source: Finnish Energy Industries

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Electricity network information

	1990	2000	2015	2016	2017
Transformer substations, number					
High voltage substations	715	591	944	970	973
Distribution substations	114 019	124 851	136 417	136 753	141 475
Lengths of low voltage lines (0.4 kV–1 kV), km					
Overhead lines	162 076	158 576	139 243	134 814	130 809
Cables (inc. sea cable)	45 705	63 327	102 746	107 978	115 432
Cabling rate	22 %	29 %	42 %	44 %	47 %
Lengths of medium voltage lines (over 1 kV–70 kV), km					
Overhead lines	122 329	121 754	115 967	113 033	108 971
Cables (inc. sea cable)	10 586	12 116	27 144	32 786	40 466
Cabling rate	8 %	9 %	19 %	22 %	27 %
Lengths of high voltage lines (110 kV–400 kV), km					
110 kV	14 000	15 050	16 231	16 495	16 352
220 kV	2 471	2 510	2 092	1 576	1 576
400 kV	3 164	3 926	5 191	5 401	5 414

Source: Energy Authority

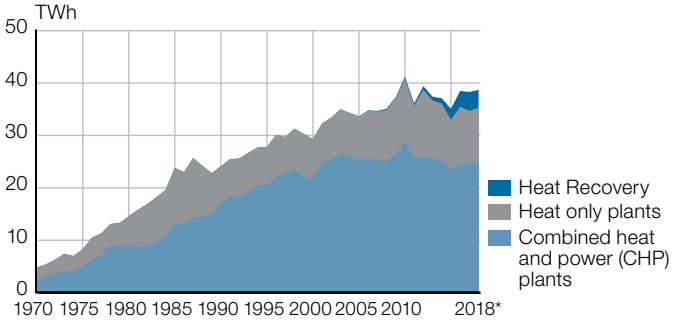
Production and consumption of district heat, TWh

	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**
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**	3.9	19.6	3.4	11.6	**34.6**
2017	13.6	24.7	**38.3**	3.4	19.3	3.5	12.1	**34.9**
2018*	13.7	25.0	**38.7**	3.6	19.2	3.5	12.4	**35.1**

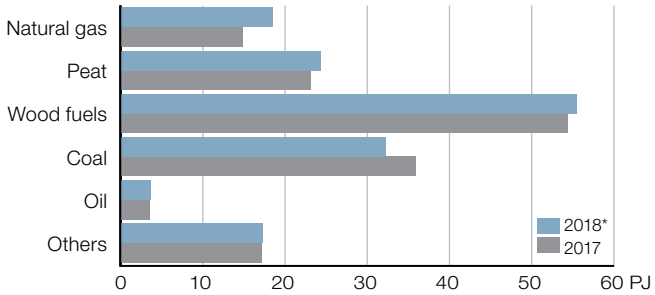
1) Heat only plants include fuel-powered heating plants and heat recovery for example from heat pumps, flue gas scrubbers and condensers. 9% of total heat production originates from heat recovery (including heat pumps).

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

Production of district heat 1970–2018*

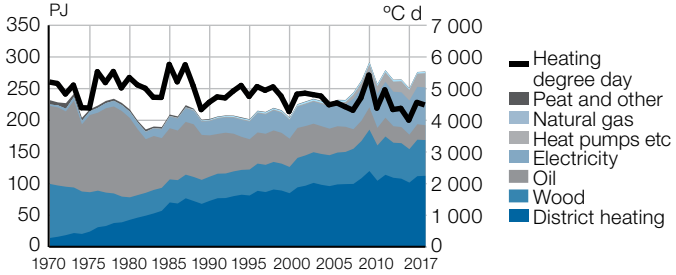


Fuel consumption in production of district heat 2017–2018*

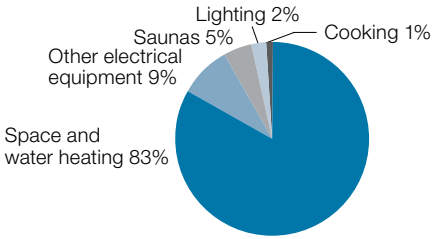


Sources: Statistics Finland, Finnish Energy Industries

Consumption of energy for heating residential, commercial and public buildings 1970–2017



Energy consumption in households 2017



Energy consumption in households in 2017 was 239 PJ.

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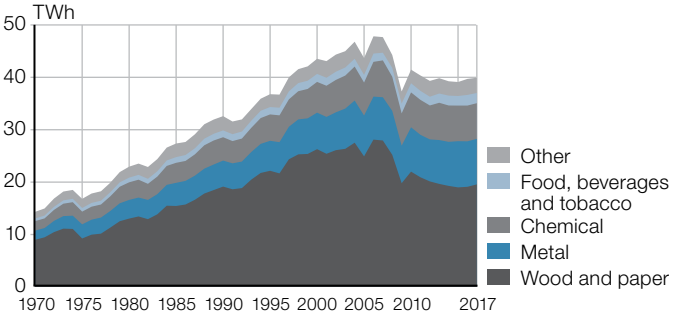
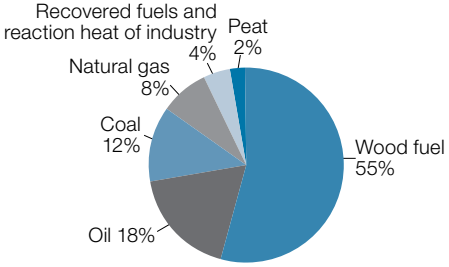
Electricity consumption by branch of industry 1970–2017



Fuel consumption in industry 2017

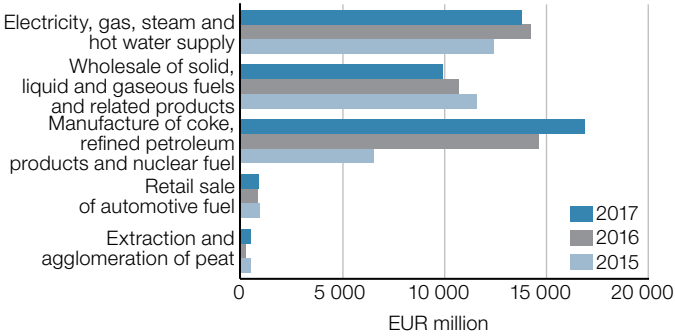


Total fuel consumption in industry in 2017 was 380 PJ.

Enterprises in energy sector in 2017

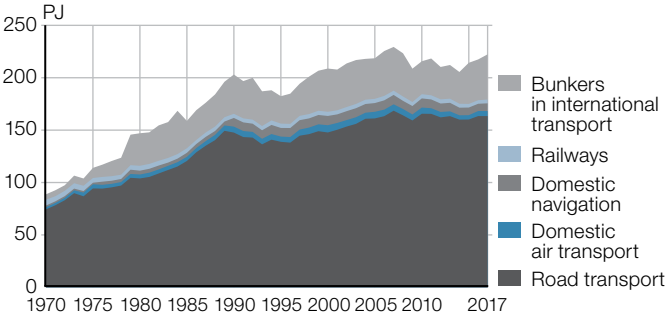
	Number of enterprises	Turnover, EUR mil.	Employees	Staff expenses, EUR mil.
Extraction and agglomeration of peat	470	459	1 406	58
Manufacture of coke, refined petroleum products and nuclear fuel	15	16 860	6 052	517
Electricity, gas, steam and hot water supply	915	13 799	14 215	991
Wholesale of solid, liquid and gaseous fuels and related products	124	9 913	1 006	84
Retail sale of automotive fuel	645	842	3 408	112

Turnover of enterprises in energy sector 2015–2017

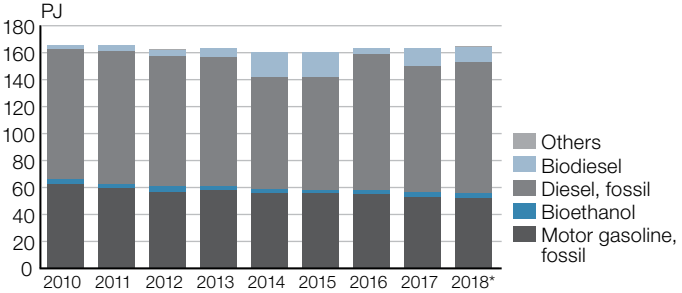


Source: Statistics Finland, Financial statements of enterprises.

Energy consumption in transport 1970–2017



Fuel consumption in road transport 2010-2018*

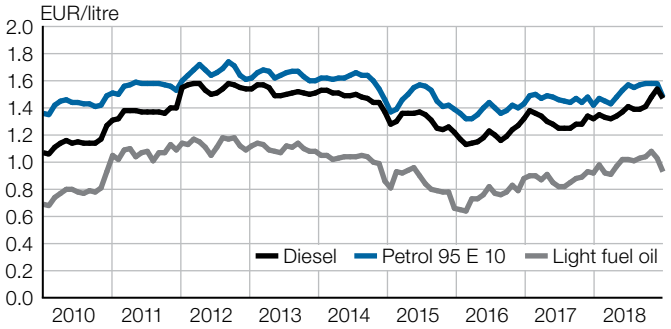


Average prices of liquid fuels, €/litre

Year	Light fuel oil	Diesel	Petrol 95 E 10	Petrol 98 E 5
2010	0.78	1.14	1.43	1.47
2011	1.07	1.37	1.56	1.62
2012	1.13	1.55	1.67	1.72
2013	1.11	1.52	1.64	1.70
2014	1.02	1.48	1.61	1.67
2015	0.84	1.30	1.46	1.53
2016	0.76	1.19	1.38	1.46
2017	0.88	1.30	1.46	1.54
2018	1.00	1.40	1.52	1.61

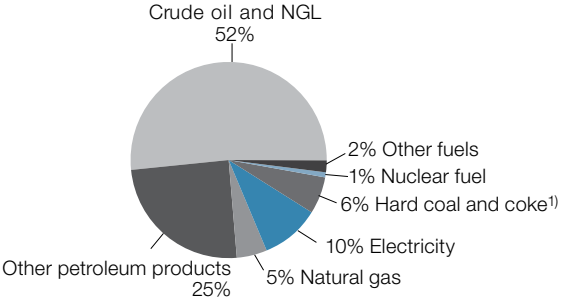
Source: Statistics Finland, Consumer Price Index

Development of liquid fuel prices 2010–2018



Source: Statistics Finland, Consumer Price Index

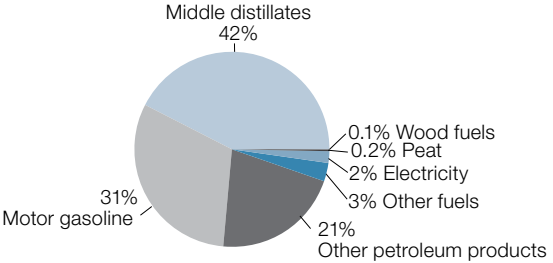
Value of energy imports 2018*



1) includes coking coal

Total imports of energy products were 10 750 million euros in 2018*.
That was 16.2% of total imports to Finland.

Value of energy exports 2018*



Total exports of energy products were 5 438 million euros in 2018*.
That was 8.5% of total exports from Finland.

Source: Finnish Customs/Foreign Trade Statistics

Energy imports 2018*

	Unit	Russia	Sweden	Norway	Other countries	Total Amount	Total Value mil. €
Coal and coal products	1000 t	2 713	0	0	1 617	**4 330**	**593**
Natural gas	mil. m^3	2 444	–	–	0	**2 444**	**578**
Oil and petroleum products [1]	1000 t	12 539	1 820	1 948	1 434	**17 741**	**8 320**
Peat	1000 t	38	4	–	2	**44**	**1**
Wood fuels [2]	1000 t	87	0	–	7	**95**	**11**
Nuclear fuel	tU	20	18	–	46	**83**	**98**
Electricity	TWh	8	14	0	1	**23**	**1 024**
Value	**€ mil.**	**6 546**	**1 827**	**956**	**1 422**		**10 750**

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

Source: Finnish Customs/ Foreign Trade Statistics

Energy exports 2018*

	Unit	Sweden	Nether-lands	United King-dom	Other coun-tries	Total Amount	Total Value mil. €
Coke [1]	1000 t	33	29	4	41	**107**	**27**
Petroleum products	1000 t	1 831	1 344	1 025	4 530	**8 729**	**5 269**
Peat	1000 t	2	4	–	56	**63**	**9**
Wood fuels [2]	1000 t	7	–	–	36	**43**	**6**
Electricity	TWh	0	–	–	2	**3**	**122**
Value	**€ mil.**	**1 420**	**685**	**566**	**2 768**		**5 438**

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

Source: Finnish Customs/ Foreign Trade Statistics

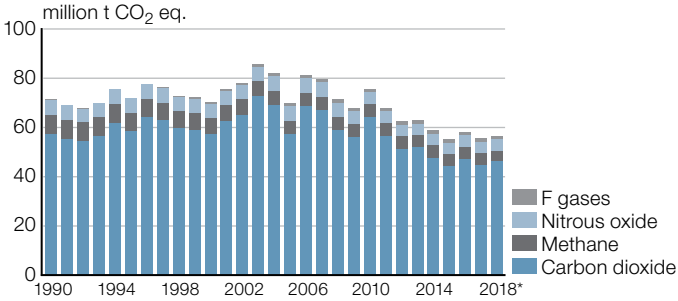
Greenhouse gas emissions 1990–2018*

The gases included in the Kyoto Protocol

	1990	1995	2000	2005	2010	2015	2016	2017	2018*
	million tonnes of CO_2 equivalent								
Energy	53.6	55.3	53.7	53.7	60.2	40.6	43.4	41.0	42.4
Industrial prosesses and product use	5.4	5.1	6.0	6.8	6.2	5.9	6.1	5.9	5.9
Agriculture	7.5	6.8	6.5	6.5	6.6	6.5	6.6	6.5	6.3
Waste	4.7	4.6	3.9	2.8	2.6	2.1	2.0	1.9	1.8
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**	**71.9**	**70.2**	**69.9**	**75.7**	**55.2**	**58.1**	**55.4**	**56.5**
Land use, land use change and forestry	–14.8	–14.0	–18.9	–24.4	–22.1	–20.1	–18.5	–20.4	–14.2

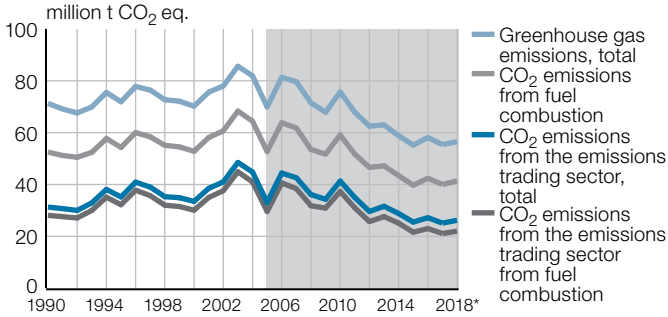
Source: Statistics Finland, Greenhouse Gas Inventory

Greenhouse gas emissions by gases 1990–2018*



Source: Statistics Finland, Greenhouse Gas Inventory

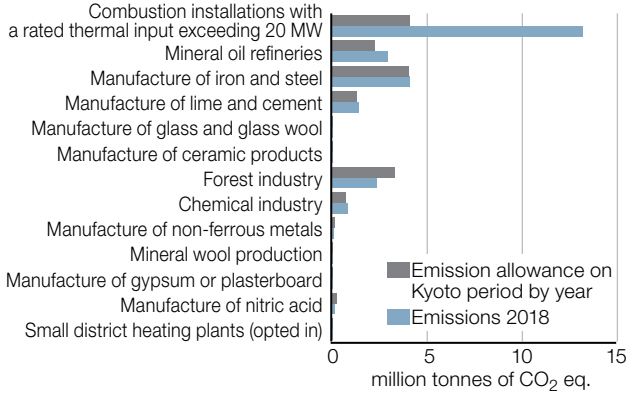
Finland's greenhouse gas emissions 1990–2018*



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 2018 by branch in Finland



Source: European Commission

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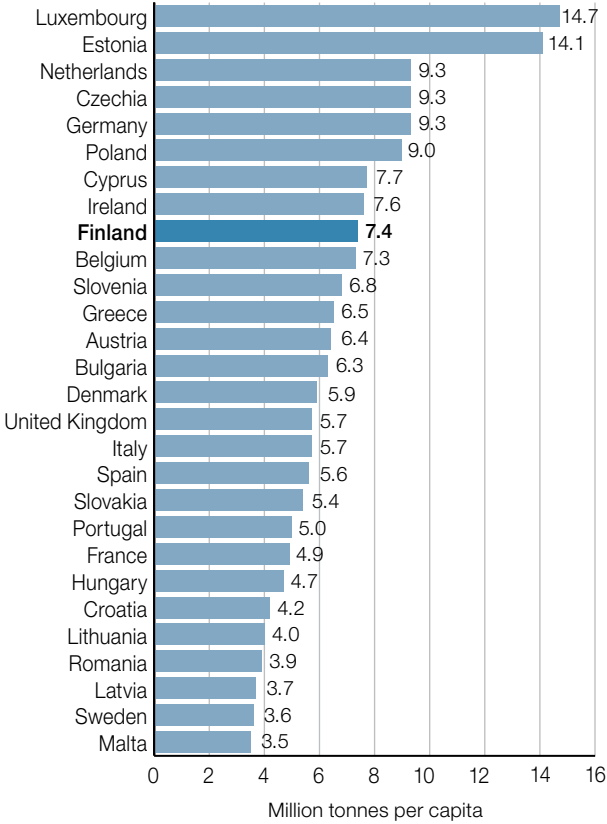
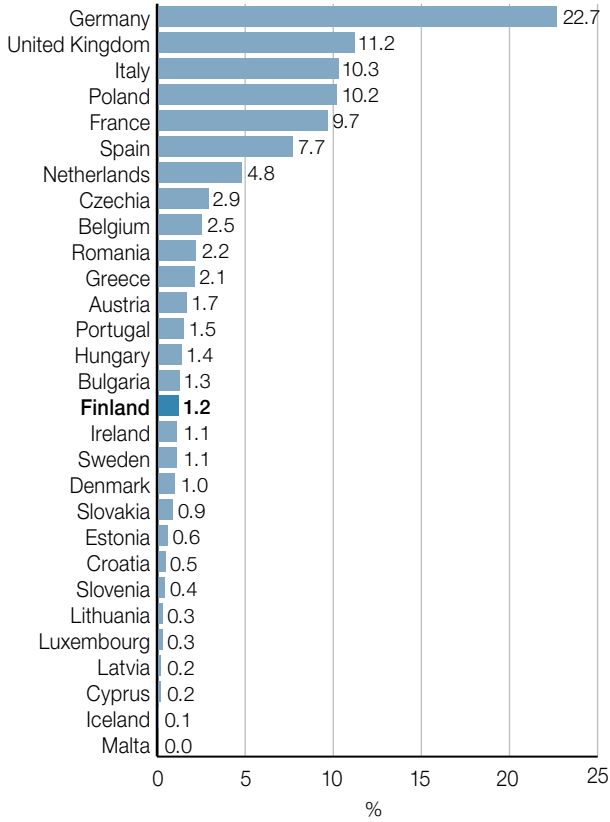
Greenhouse gas emissions in EU energy sector per capita 2017



Source: European Environment Agency

Share of greenhouse gas emissions from EU energy sector by country 2017



Source: European Environment Agency

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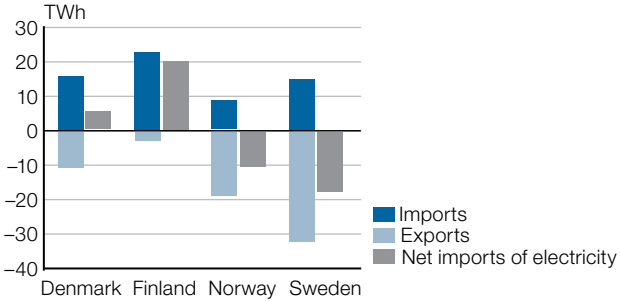
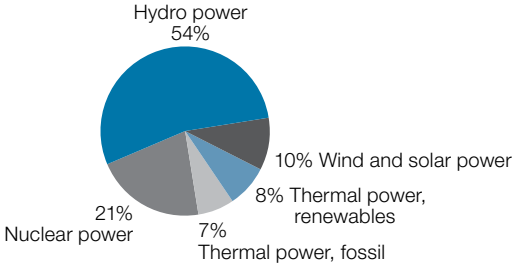
Imports and exports of electricity in Nordic countries 2018



Total electricity generation in Nordic Countries 2018



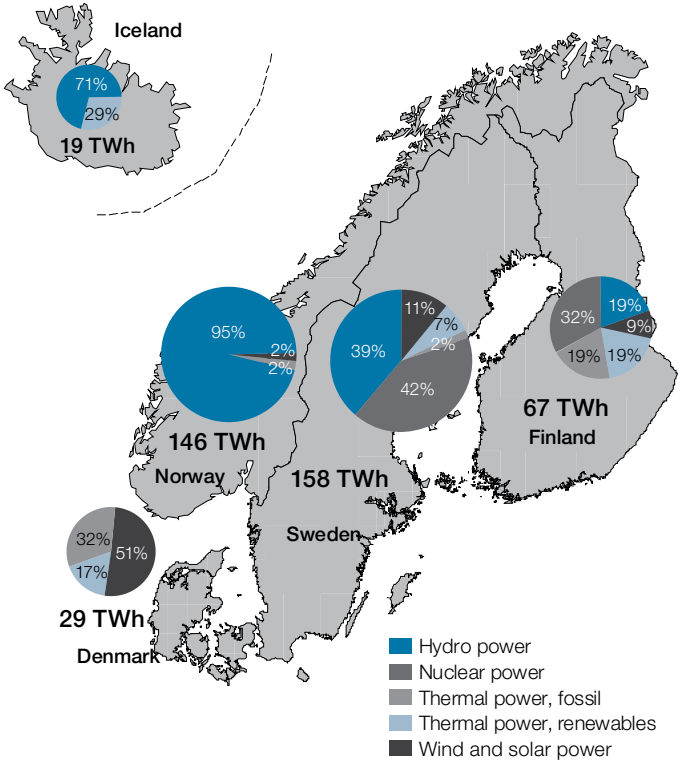
Total generation 420 TWh

Electricity consumption in Nordic Countries 2018, TWh

Sweden	141
Norway	135
Finland	87
Denmark	34
Iceland	19
Total	**417**

Source: Entso-e: Monthly Statistics 2018, Statistics Norway

Electricity generation in Nordic Countries 2018

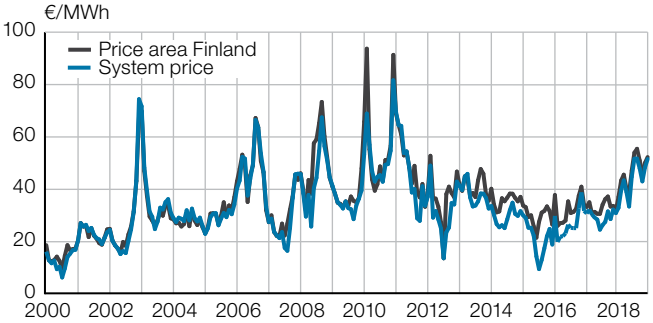


Source: Entso-e: Monthly Statistics 2018, Statistics Norway

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

Year	Oslo	Stockholm	Helsinki	Copenhagen	Tallinn	System
2013	37.56	39.45	41.16	39.61	43.14	38.10
2014	27.33	31.62	36.02	32.15	37.61	29.61
2015	19.85	22.00	29.66	24.49	31.08	20.98
2016	26.17	29.23	32.45	29.40	33.06	26.91
2017	29.04	31.24	33.19	31.97	33.20	29.41
2018	43.65	44.54	46.80	46.20	47.07	43.99

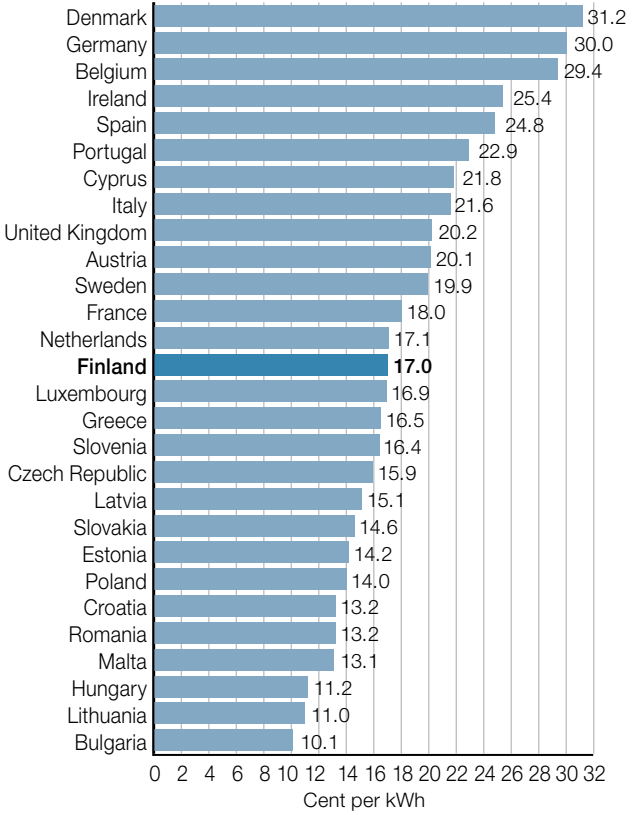
Development of spot prices on Nord Pool



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

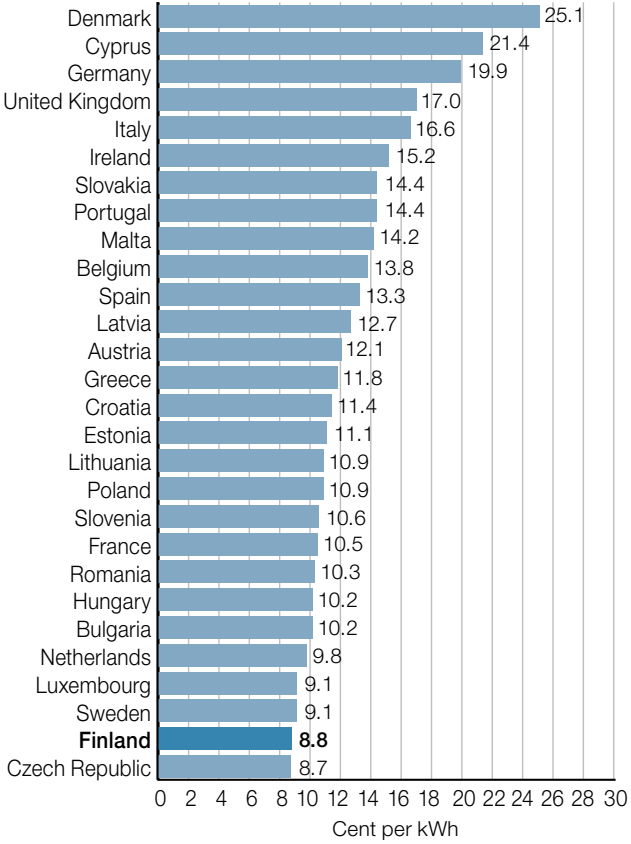
Electricity prices for households on the 2nd half of 2018



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

Source: Eurostat

Electricity prices for industry on the 2nd half of 2018



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

Source: Eurostat

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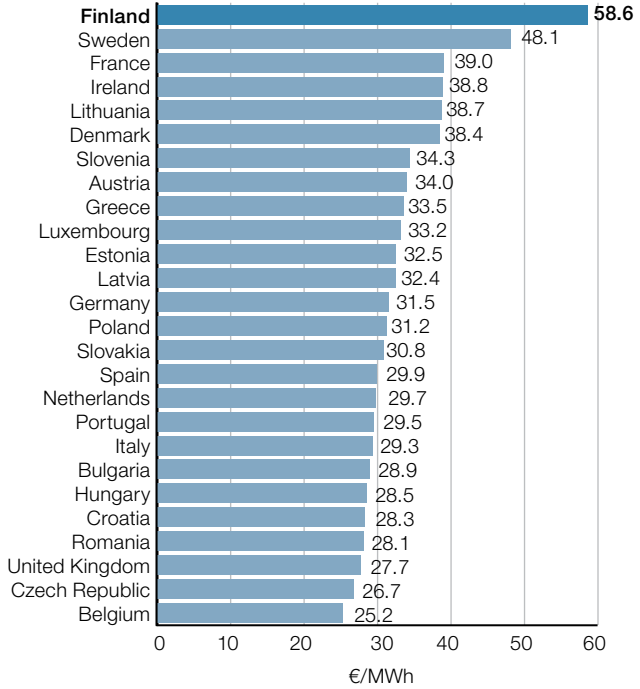
Gas prices for non-household consumers on the 2nd half of 2018



Annual consumption 10 000 GJ – 100 000 GJ. Excluding VAT and other recoverable taxes and levies.

Source: Eurostat

Primary energy consumption in EU, PJ

	1990	1995	2000	2005	2010	2015	2016	2017
Germany	13 927	13 287	13 278	13 409	13 061	12 362	12 464	12 490
France	8 920	9 384	10 039	10 924	10 653	10 230	10 058	10 028
United Kingdom	8 422	8 832	9 293	9 357	8 587	7 664	7 528	7 403
Italy	5 766	6 339	6 955	7 571	7 004	6 244	6 195	6 236
Spain	3 456	3 966	4 816	5 717	5 163	4 965	4 992	5 260
Poland	4 150	4 022	3 553	3 683	4 043	3 770	3 970	4 150
Netherlands	2 449	2 736	2 803	2 936	3 003	2 670	2 714	2 702
Belgium	1 910	2 020	2 195	2 159	2 267	1 929	2 063	2 057
Sweden	1 901	2 026	1 924	2 068	2 034	1 888	1 964	1 946
Czech Republic	2 018	1 651	1 638	1 780	1 787	1 664	1 677	1 690
Austria	992	1 084	1 151	1 363	1 357	1 321	1 327	1 363
Romania	2 611	1 907	1 460	1 508	1 380	1 287	1 282	1 355
Finland	**1 139**	**1 175**	**1 324**	**1 405**	**1 486**	**1 304**	**1 354**	**1 337**
Hungary	1 147	1 022	990	1 103	1 031	975	994	1 025
Greece	901	960	1 131	1 261	1 133	970	956	968
Portugal	633	780	961	1 040	948	906	911	954
Bulgaria	1 122	927	739	805	729	752	740	768
Denmark	738	825	800	814	838	709	727	743
Slovakia	823	705	685	729	697	637	643	676
Ireland	404	429	573	626	618	583	612	603
Croatia	374	297	326	383	371	333	337	349
Slovenia	240	250	260	294	293	265	274	278
Lithuania	642	345	274	337	258	243	253	258
Estonia	393	210	191	211	233	223	247	236
Latvia	330	192	159	188	191	179	180	187
Luxembourg	146	137	151	200	193	173	174	180
Cyprus	66	80	98	104	112	95	101	106
Malta	32	33	34	38	39	31	30	34
EU 28	**65 653**	**65 624**	**67 800**	**72 011**	**69 510**	**64 371**	**64 767**	**65 381**

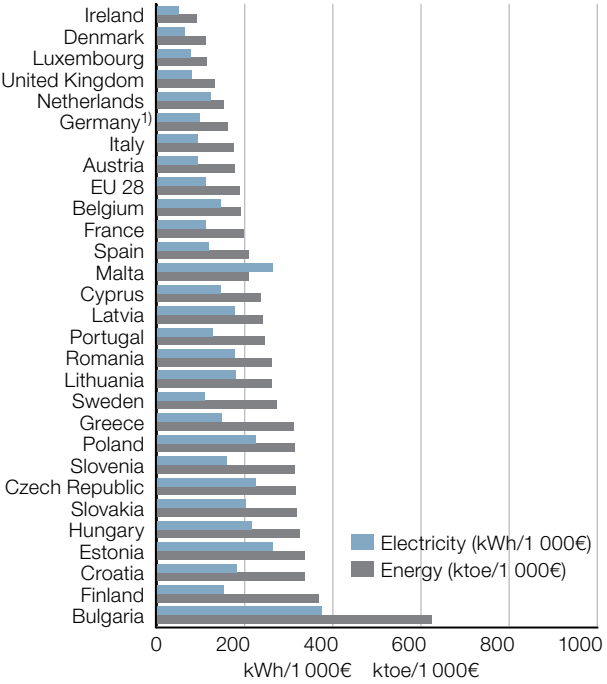
Source: Eurostat

Electricity consumption in EU, TWh

	1990	1995	2000	2005	2010	2015	2016	2017
Germany	481	473	501	539	547	528	530	531
France	323	368	410	451	472	448	455	452
United Kingdom	284	304	340	357	338	311	311	308
Italy	219	243	279	310	310	297	296	302
Spain	129	146	195	248	251	239	240	243
Poland	109	104	109	116	129	139	144	146
Sweden	131	127	131	133	135	128	131	130
Netherlands	75	85	100	108	112	109	111	112
Belgium	59	70	79	84	86	83	83	84
Finland	**59**	**66**	**76**	**82**	**85**	**80**	**82**	**82**
Austria	44	48	53	59	62	63	64	65
Czech Republic	53	52	52	58	58	59	60	61
Greece	30	36	45	53	55	52	55	56
Romania	60	46	41	47	46	47	47	49
Portugal	24	29	39	47	51	47	47	48
Hungary	33	29	31	36	36	38	39	40
Denmark	29	32	33	34	33	32	32	32
Bulgaria	37	31	25	27	28	30	30	31
Slovakia	25	23	23	24	25	25	26	27
Ireland	12	15	20	24	26	26	26	27
Croatia	14	10	12	15	16	16	16	16
Slovenia	9	9	11	13	12	13	13	14
Lithuania	13	7	7	9	9	10	11	11
Estonia	7	5	5	6	7	7	8	8
Latvia	8	4	4	6	6	6	6	6
Luxembourg	4	5	6	6	7	6	6	6
Cyprus	2	2	3	4	5	4	4	5
Malta	1	1	2	2	2	2	2	2
EU 28	**2 275**	**2 370**	**2 634**	**2 898**	**2 949**	**2 846**	**2 877**	**2 896**

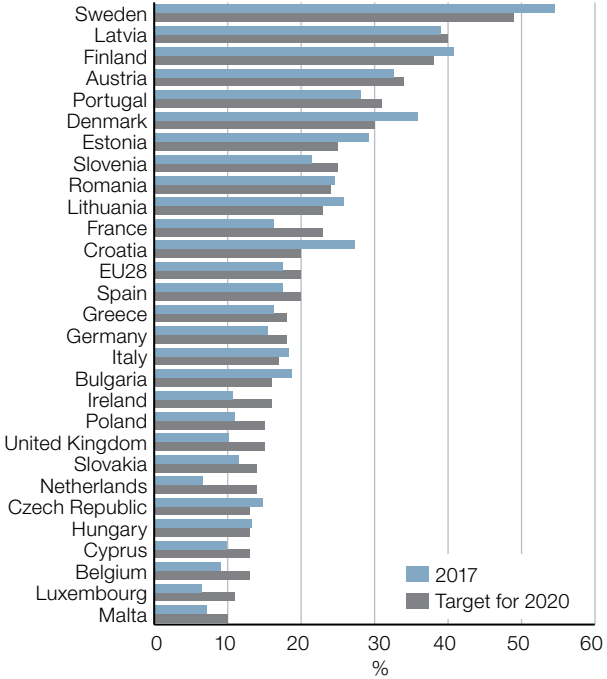
Source: Eurostat

Consumption of energy and electricity per GDP-unit in EU countries 2017



1) Until 1990 former territory of the FRG
Source: Eurostat

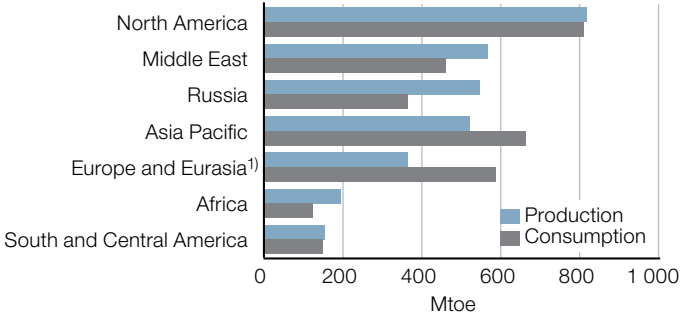
Share of renewable energy in gross final energy consumption in 2017, and the target for 2020



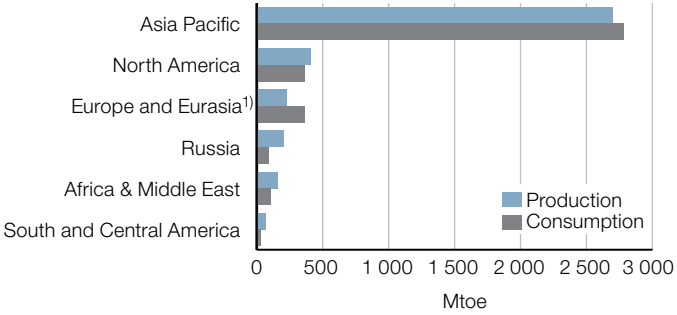
This indicator is calculated on the basis of data covered by Regulation (EC) No 1099/2008 on energy statistics. Reporting countries provide additional information on renewable source not covered by the Regulation. This indicator may be considered an estimate of the indicator described in Directive 2009/28/EC 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 2017



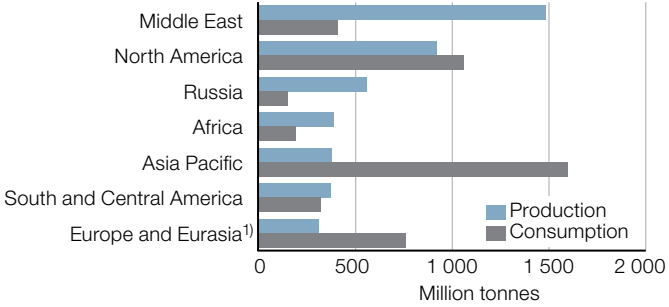
Coal production and consumption by region in 2017



1) excludes Russia

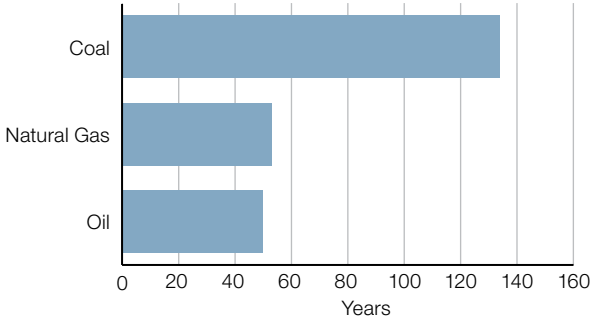
Source: BP Statistical Review of World Energy 2018

Oil production and consumption by region in 2017



1) excludes Russia

World oil, natural gas and coal reserve sufficiency



Total reserves at the end of 2017: oil 239 billion tonnes, natural gas 193 trillion m^3, coal 1 035 billion tonnes.

Source: BP Statistical Review of World Energy 2018

Net heat contents and densities of energy sources

Fuels	Unit	Net heat content GJ	Net heat content MWh	Density t/m³
Heavy fuel oil, sulphur content <1%	t	40.4	11.2	0.99
Heavy fuel oil, sulphur content ≥1%	t	40.2	11.2	1.00
Light fuel oil	t	43.0	11.9	0.84
Diesel oil	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 gasoline	t	41.7	11.6	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	24.9	6.9	
Coke	t	29.3	8.1	
Natural gas	1 000 m³ (0°C)	36.5	10.1	
Coke oven gas	1 000 m³	16.7	4.6	
Blast furnace gas	1 000 m³	3.8	1.1	
Milled peat	t	9.8	2.7	0.32
Sod peat	t	12.1	3.4	0.38
Black liquor	t (dry matter)	11.5	3.2	
Chips from roundwood	t	7–11		
Forest residue chips	t	8–13		
Bark	t	5–11		
Saw dust	t	6–10		
Wood pellets	t	15–18		
Biogas[1]	1 000 m³	17–28		

1 Excl. biomethane and synthetic biogas.

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 gasolines	68.6	Default bio share 8%
Diesel fuel	65.5	Default bio share 11%
Light fuel oil	73.5	
Heavy fuel oil	79.2	
Kerosenes	73.2	
LPG	64.9	
Other oils	71.3–79.2	
Hard coal	93.2	
Coke	107.0	
Natural gas	55.3	
Milled peat	107.6	
Bark, wood fuel	109.6	
Industrial wood residue	109.6	
Black liquor	109.6	

Source: Statistics Finland/Fuel classification 2018
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.

Due to rounding, the sum of percentages does not always add up to 100%.

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%

Source: Technical Research Centre of Finland (VTT) and Tampere University

Explanation of symbols

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

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/energia2018/.

Energy in Finland

Statistical pocketbook on energy statistics.

www.tilastokeskus.fi/energia

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