



Statistics Finland 

ENERGY IN FINLAND

2020

Finland in brief

Area

Situated in northern Europe with an area of 338,432 km² 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 2019

Town	Latitude	January	July
Helsinki	60°	-4.6°C	17.5°C
Sodankylä	67°	-16.8°C	13.5°C

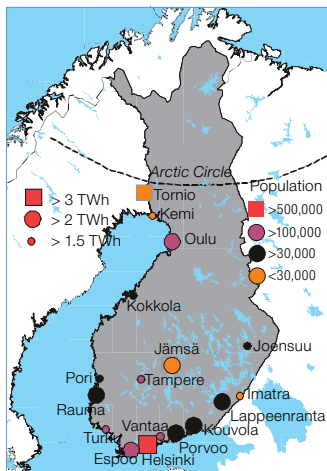
Economy

In 2019* GDP totalled € 240.6 bil., i.e. € 43,567/capita. In 2019* services were 69.4%, secondary production 28.0% and primary production 2.7% of the GDP.

Structure of industry, Value added gross in production in 2019*

	bil. €	%
Total industry	35.4	100
Mining and quarrying	0.8	2
Forest industry	5.2	15
Chemical industry	5.6	16
Metal industry	13.5	38
Basic metals and metal prod.	3.9	11
Electrical and electronics ind.	3.2	9
Other metal industry	6.3	18
Other manufacturing ind.	5.1	14
Energy supply	4.0	11
Water supply and waste management	1.2	3

Municipalities with high electricity consumption 2018



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 2019*

1,362 PJ (32.5 Mtoe)
247 GJ/capita (5.9 toe/capita)

CO₂ emissions in energy sector in 2019*

38.8 million t CO₂
7.0 t CO₂/capita

Contents

Total energy consumption	2
Renewable energy	9
Greenhouse gases	13
Electricity	19
Heating and cooling	33
Transport	37
International fossil fuel statistics	41
Industry and enterprises	45
Imports and exports	48
Net heat contents and conversion factors	51



The data in this pocketbook are based on the Preliminary Energy Statistics 2019 figures.

Inquiries: Enni Sanasvuori
+358 29 551 3058
energia@stat.fi
<http://www.stat.fi/energia>

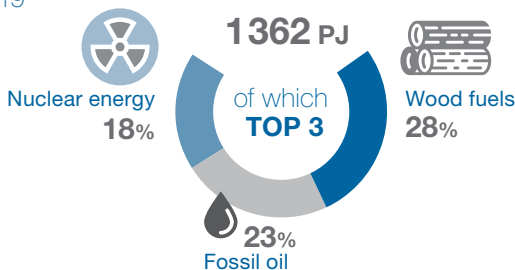
Cover photograph: Anna-Riikka Pitkänen
Cover design and layout: Hilikka Lehtonen, Statistics Finland
Printed by: PunaMusta Oy, Helsinki 2020

© 2020 Statistics Finland

Quoting is encouraged provided Statistics Finland is acknowledged as the source.

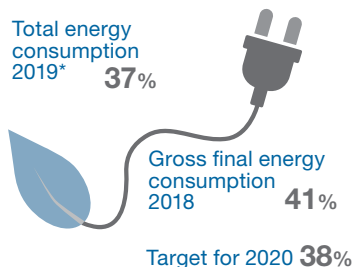
Total energy consumption

TOTAL ENERGY CONSUMPTION
2019*

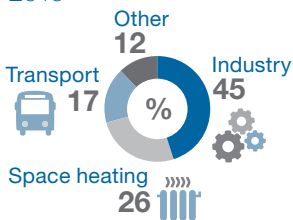


RENEWABLE ENERGY

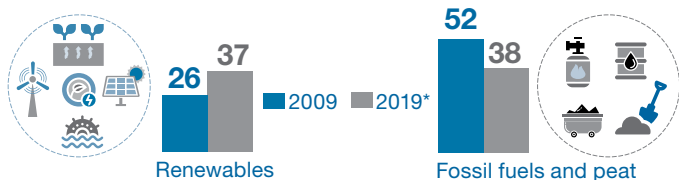
Total energy consumption
2019* **37%**



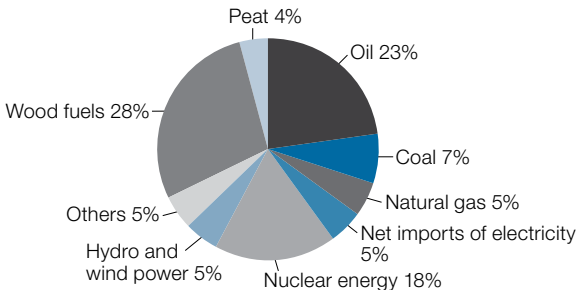
FINAL ENERGY CONSUMPTION 2019*



SHARES IN TOTAL ENERGY CONSUMPTION, %

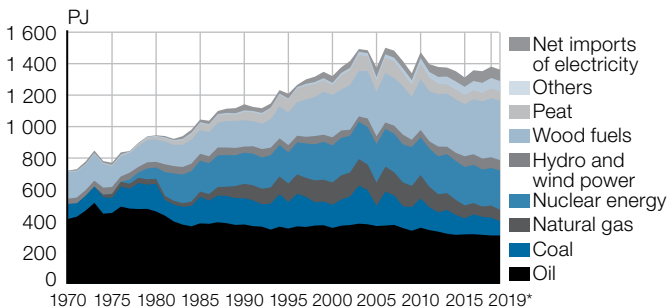


Total energy consumption by energy source 2019*



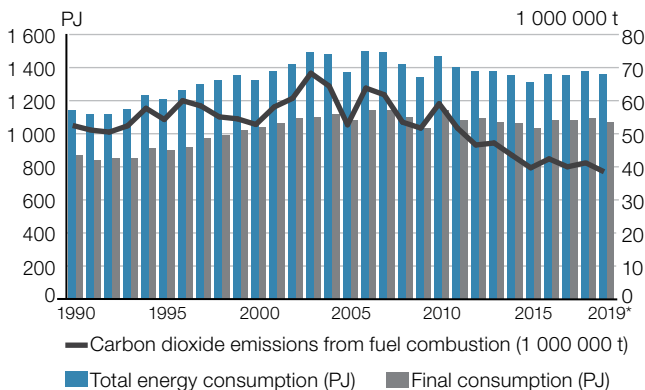
Total energy consumption in 2019* was 1 362 PJ.

Total energy consumption by energy source 1970–2019*

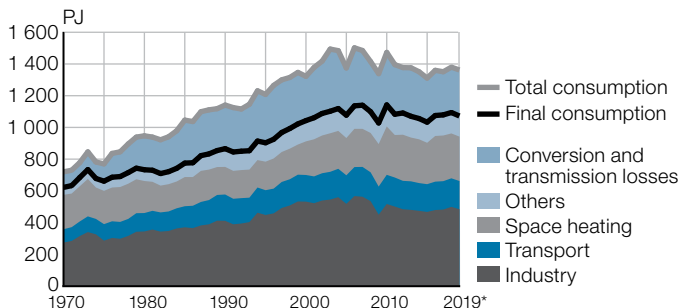


Oil includes transport biofuels.

Energy consumption and carbon dioxide emissions from fuel combustion 1990–2019*



Total energy consumption and final energy consumption by sector 1970–2019*



Primary energy consumption in EU28, PJ

	1990	1995	2000	2005	2010	2015	2017	2018
Germany	13 927	13 287	13 278	13 465	13 195	12 390	12 482	12 215
France	8 920	9 384	10 039	10 924	10 653	10 233	10 013	10 002
United Kingdom	8 422	8 832	9 293	9 357	8 587	7 640	7 398	7 373
Italy	5 766	6 339	6 955	7 571	7 004	6 244	6 236	6 165
Spain	3 456	3 966	4 795	5 696	5 145	4 942	5 243	5 216
Poland	4 150	4 022	3 552	3 683	4 043	3 770	4 152	4 231
Netherlands	2 449	2 736	2 803	2 935	3 003	2 672	2 727	2 710
Sweden	1 901	2 026	1 924	2 063	2 034	1 837	1 942	1 966
Belgium	1 910	2 020	2 195	2 159	2 267	1 928	2 055	1 961
Czechia	2 018	1 651	1 639	1 780	1 787	1 664	1 690	1 691
Finland	1 139	1 175	1 324	1 405	1 486	1 304	1 343	1 371
Romania	2 611	1 907	1 460	1 510	1 379	1 287	1 359	1 364
Austria	993	1 084	1 151	1 370	1 376	1 324	1 374	1 331
Hungary	1 147	1 022	990	1 103	1 031	975	1 026	1 025
Portugal	633	780	961	1 040	948	906	955	949
Greece	901	963	1 137	1 268	1 140	979	973	946
Bulgaria	1 121	927	739	805	728	752	767	768
Denmark	737	825	801	814	838	707	742	745
Slovakia	823	705	685	729	697	637	676	661
Ireland	404	429	573	626	616	583	603	609
Croatia	374	297	326	383	371	333	349	342
Slovenia	240	250	260	294	293	265	282	279
Lithuania	642	345	274	337	258	243	258	265
Estonia	392	209	191	211	234	223	236	258
Latvia	330	192	159	188	191	179	187	196
Luxembourg	146	137	151	200	193	173	180	187
Cyprus	66	80	98	104	112	95	106	107
Malta	32	33	34	38	39	31	34	34
EU28	65 649	65 626	67 786	72 057	69 648	64 318	65 385	64 969

Source: Eurostat

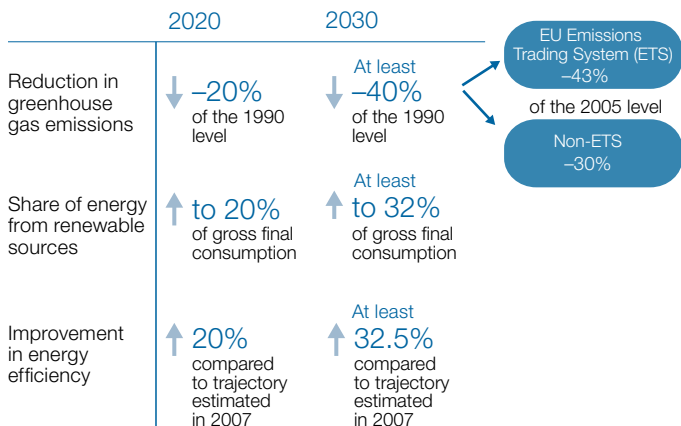
Total energy consumption by energy source, PJ

	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	352.0	167.6	117.6	197.8	46.0	0.0
1996	365.7	206.8	123.1	203.8	42.1	0.0
1997	362.4	190.8	121.1	218.7	42.5	0.1
1998	370.9	148.0	138.7	228.8	53.2	0.1
1999	373.4	149.9	138.9	240.7	45.2	0.2
2000	355.9	146.7	141.9	235.4	52.0	0.3
2001	370.0	165.8	153.9	238.4	46.9	0.3
2002	373.8	182.3	152.9	233.4	38.2	0.2
2003	382.7	241.4	169.2	238.1	34.0	0.3
2004	378.6	217.4	163.0	238.0	53.5	0.4
2005	368.4	127.7	149.1	243.9	48.3	0.6
2006	371.3	214.6	159.4	240.0	40.7	0.5
2007	375.3	188.1	147.5	245.5	50.4	0.7
2008	354.6	139.3	150.8	240.5	60.9	0.9
2009	338.3	150.1	134.6	246.6	45.3	1.0
2010	357.2	186.3	148.7	238.8	45.9	1.1
2011	341.7	145.2	130.0	242.9	44.2	1.7
2012	331.5	122.7	115.0	240.7	60.0	1.8
2013	319.1	151.3	106.9	247.3	45.6	2.8
2014	311.5	126.2	95.6	247.0	47.7	4.0
2015	314.9	101.9	82.4	243.6	59.7	8.4
2016	315.9	126.5	72.2	243.1	56.3	11.0
2017	311.7	113.6	66.0	235.4	52.6	17.3
2018	308.4	113.6	75.6	238.7	47.3	21.0
2019*	308.5	91.4	72.8	250.1	44.2	21.4
Share						
2019*	23%	7%	5%	18%	3%	2%
Annual change						
18/19*	0%	−20%	−4%	5%	−6%	2%

Oil includes transport biofuels.

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	1 208.1	1995
212.8	87.5	9.9	13.2	1 264.9	1996
237.2	88.0	12.1	27.6	1 300.3	1997
247.6	80.7	13.8	33.5	1 315.5	1998
272.8	71.8	14.6	40.0	1 347.3	1999
267.9	63.3	15.4	42.8	1 321.5	2000
261.5	88.0	17.2	35.9	1 377.7	2001
282.7	93.4	17.9	42.9	1 417.8	2002
287.8	102.7	20.0	17.5	1 493.8	2003
302.0	91.8	21.7	17.5	1 483.9	2004
280.9	70.9	23.5	61.3	1 374.6	2005
315.1	95.5	23.1	41.0	1 501.5	2006
302.3	104.8	25.5	45.2	1 485.1	2007
308.0	84.1	30.2	46.0	1 415.2	2008
272.1	74.8	32.2	43.5	1 338.5	2009
323.7	97.8	35.3	37.8	1 472.6	2010
318.4	85.6	36.7	49.9	1 396.4	2011
332.1	66.4	44.6	62.8	1 377.5	2012
338.5	57.6	50.0	56.6	1 375.8	2013
339.4	61.1	53.8	64.7	1 351.0	2014
330.9	58.0	53.0	58.8	1 311.5	2015
350.1	56.3	60.3	68.2	1 359.9	2016
362.8	53.9	64.2	73.5	1 350.9	2017
374.7	61.9	66.8	71.8	1 379.8	2018
379.3	56.3	68.6	72.2	1 361.8	2019*
					Share
28%	4%	5%	5%	100%	2019*
					Annual change
1%	-9%	3%	1%	-1%	18/19*

Joint EU28 climate and energy targets for 2020 and 2030



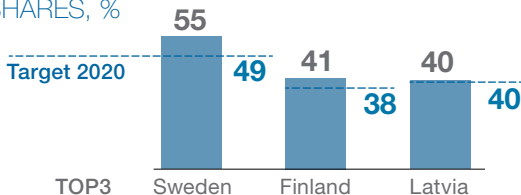
Source: Suomen kasvihuonekaasupäästöt 1990–2019
(Finland's Greenhouse Gas Emissions 1990–2019, in Finnish)
<https://www.stat.fi/tup/khkinv/khkaasut-suominir.html>

**Aim of the Government Programme (2019):
Finland to be carbon neutral in 2035.**

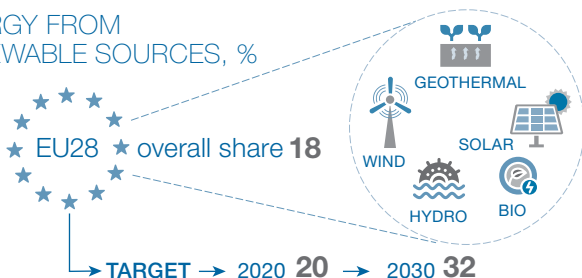
Renewable energy

OVERALL SHARES, %
2018

EU28
overall share

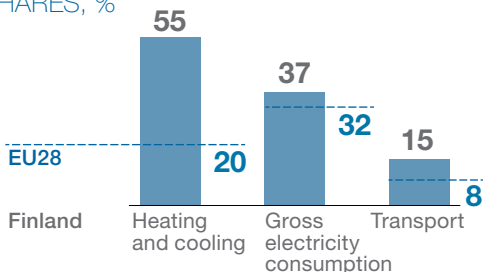


ENERGY FROM
RENEWABLE SOURCES, %
2018



SECTORAL SHARES, %
2018

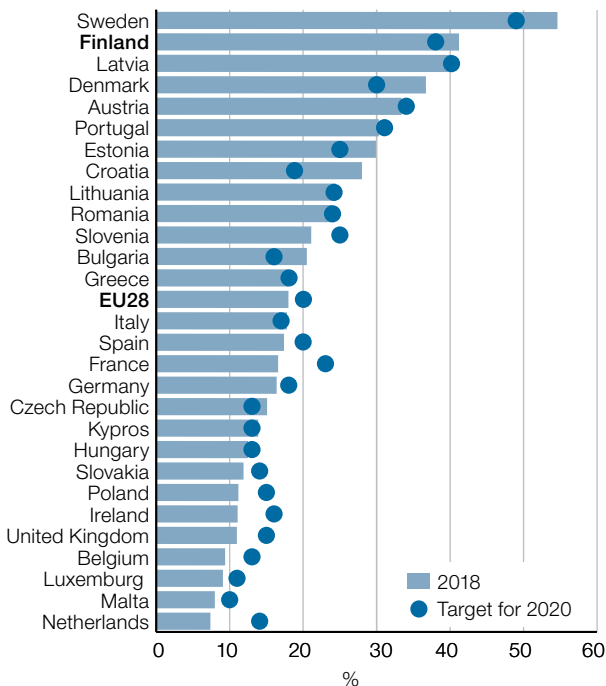
Share of energy



Shares of renewable energy from gross final consumption.

Source: Eurostat

Shares of renewable energy in gross final energy consumption in 2018 and the country-specific EU targets for 2020



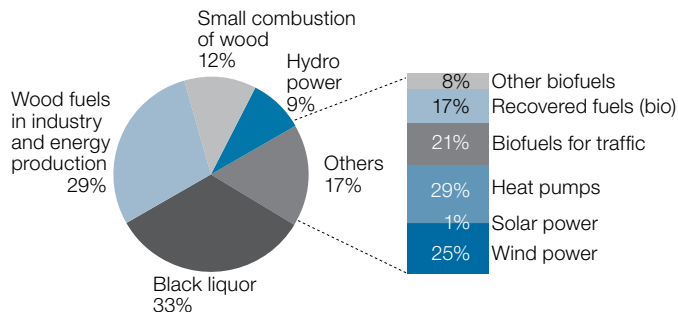
This indicator is calculated on the basis of data covered by Regulation (EC) No 1099/2008 on energy statistics. Reporting countries provide additional information on renewable source not covered by the Regulation. This indicator may be considered an estimate of the indicator described in Directive 2009/28/EC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

Source: Eurostat

Renewable energy in Finland, PJ

	Hydro power	Wind power	Wood fuels in industry and energy production	Black liquor	Small combustion of wood	Heat pumps	Others	Total	Share of total energy consumption, %
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
2010	45.9	1.1	116.4	135.7	71.7	10.4	17.3	398.3	27
2011	44.2	1.7	122.4	135.1	60.9	12.0	20.0	396.3	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	446.1	33
2015	59.7	8.4	130.5	142.1	58.4	17.3	38.3	454.6	35
2016	56.3	11.0	140.3	146.3	63.5	21.3	27.3	466.0	34
2017	52.6	17.3	145.7	154.8	62.4	23.0	37.3	493.0	36
2018	47.3	21.0	146.2	167.0	61.4	23.8	37.6	504.5	37
2019*	44.2	21.4	149.1	169.7	60.4	24.9	40.8	510.6	37

Renewable energy 2019*

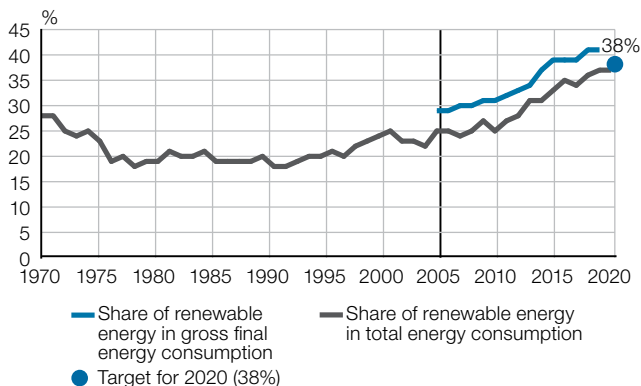


The divisions of the group Others are partly based on data for 2018.

The total consumption of renewable energy in 2019* was 511 PJ which is 37% of total energy consumption.

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

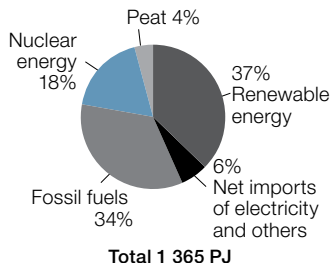
Share of renewable energy in total energy consumption (1970–2019*) and gross final energy consumption (2004–2018) and target for 2020



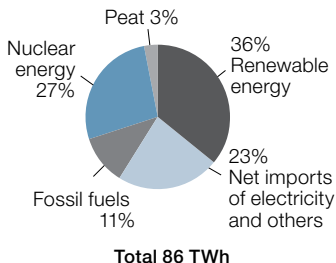
Share of renewable energy in gross final energy consumption in 2018 was 41%.

Shares of renewable energy 2019*

In total energy consumption

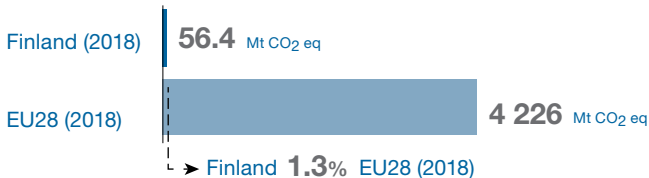


In electricity supply

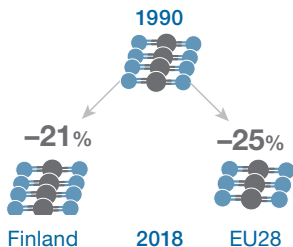


Greenhouse gases

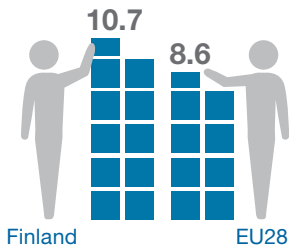
TOTAL EMISSIONS¹⁾



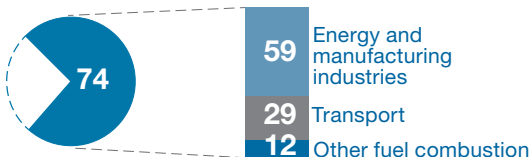
TOTAL EMISSIONS¹⁾ BETWEEN 1990 AND 2018



TOTAL EMISSIONS¹⁾ PER CAPITA 2018 tonnes



ENERGY SECTOR EMISSIONS OF TOTAL EMISSIONS¹⁾ IN FINLAND, % 2019*



*According to Statistics Finland's instant preliminary data

1) Without LULUCF

Source: EEA and Statistics Finland

Greenhouse gas emissions 1990–2019*

The gases included in the Kyoto Protocol

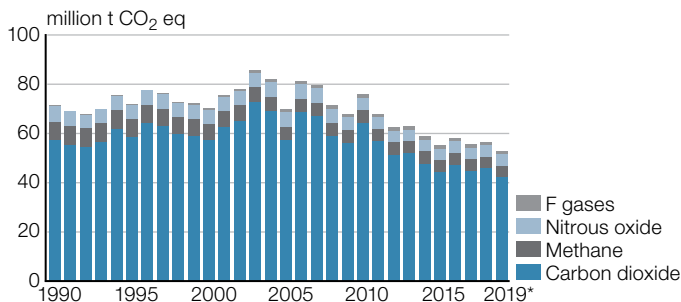
	1990	1995	2000	2005	2010	2015	2017	2018	2019*
	million tonnes of CO ₂ equivalent								
Energy	53.5	55.3	53.7	53.7	60.3	40.6	41.0	42.1	38.8
Industrial processes and product use	5.4	5.1	6.0	6.8	6.2	5.8	5.8	5.8	5.5
Agriculture	7.5	6.7	6.6	6.5	6.7	6.6	6.6	6.6	6.6
Waste	4.7	4.6	3.8	2.8	2.6	2.1	1.9	1.8	1.7
Indirect CO ₂ emissions	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	71.2	71.8	70.3	69.9	75.7	55.1	55.4	56.4	52.8
Land use, land use change and forestry	-14.8	-14.1	-18.9	-24.4	-22.5	-18.9	-17.2	-10.3	-17.4

* Finland's instant preliminary data

Emissions to the atmosphere are positive and removals are negative in the table.

Source: Statistics Finland, Greenhouse Gas Inventory,

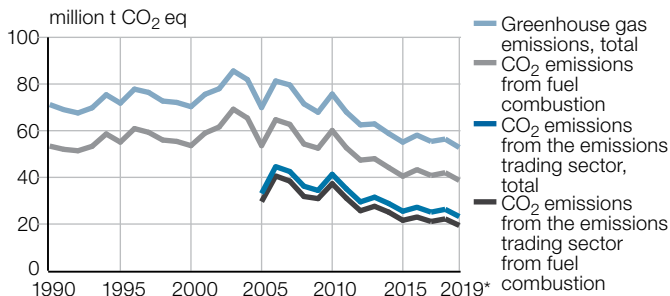
Greenhouse gas emissions by gases 1990–2019*



* Finland's instant preliminary data

Source: Statistics Finland, Greenhouse Gas Inventory

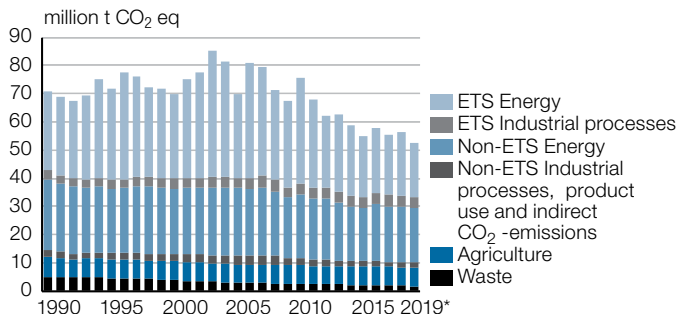
Finland's greenhouse gas emissions 1990–2019*



The EU's emissions trading started in 2005.

Source: Statistics Finland, Greenhouse Gas Inventory

Emissions of the emissions trading sector and emissions not included in the EU ETS 1990–2019*



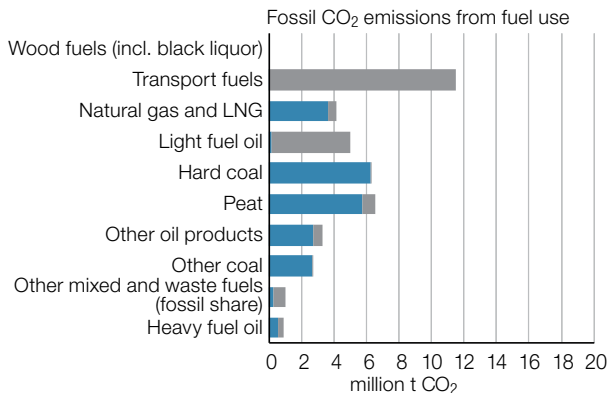
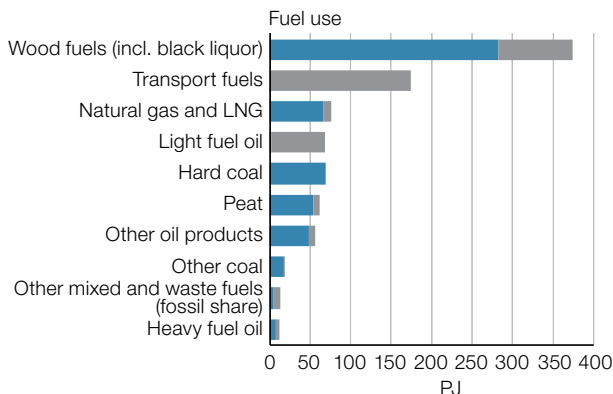
ETS = Emissions Trading System emissions,

Non-ETS = emissions not included in the EU ETS

Total emissions in 1990 to 2004 have been divided into emissions of the sectors in the EU Emissions Trading System (EU ETS) and emissions not included in the EU Emissions Trading System (EU ETS) by coverage according to the emissions trading period 2005 to 2007.

* According to Statistics Finland's instant preliminary data.

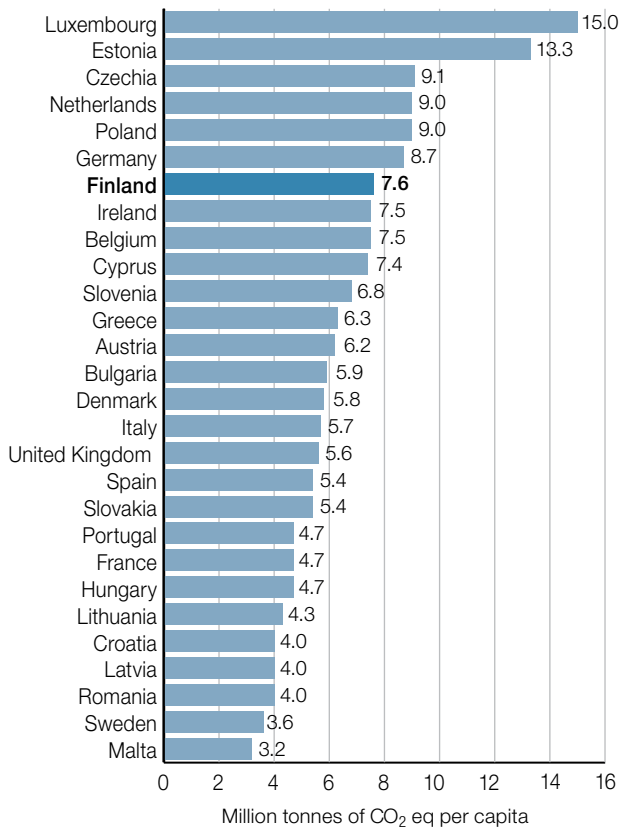
Fuel use and emissions of the emissions trading sector and emissions not included in the EU ETS by fuel type in 2018



■ Emissions trading sector, i.e. emissions included in the EU Emissions Trading System

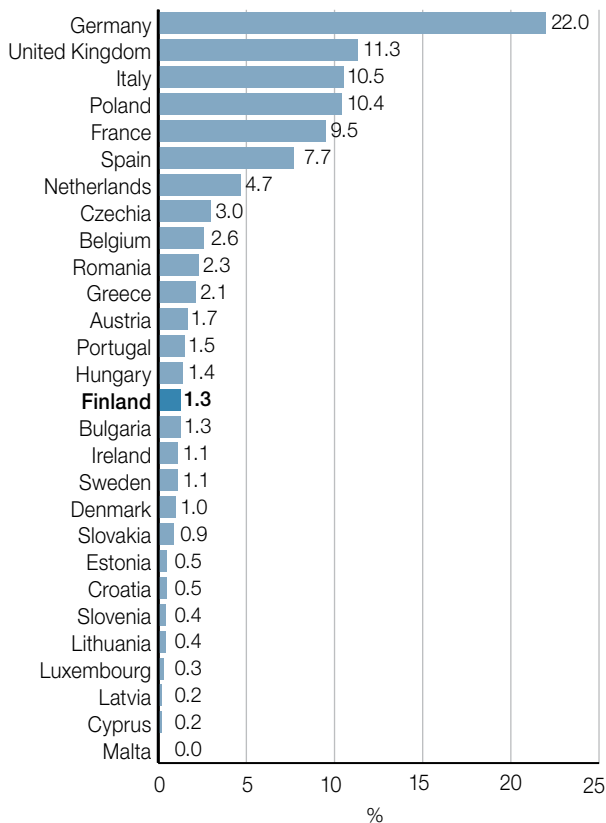
■ Emissions not included in the EU Emissions Trading System

Greenhouse gas emissions in EU energy sector per capita 2018



Source: European Environment Agency

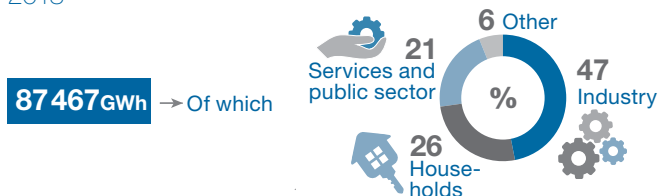
Share in the EU's energy sector greenhouse gas emissions in 2018



Source: European Environment Agency

Electricity

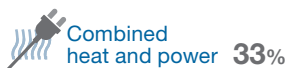
TOTAL ELECTRICITY CONSUMPTION 2018



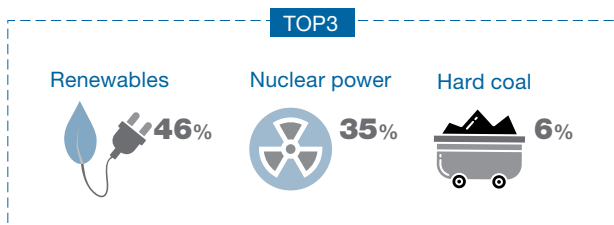
TOTAL ELECTRICITY CONSUMPTION INCREASE 1980–2019



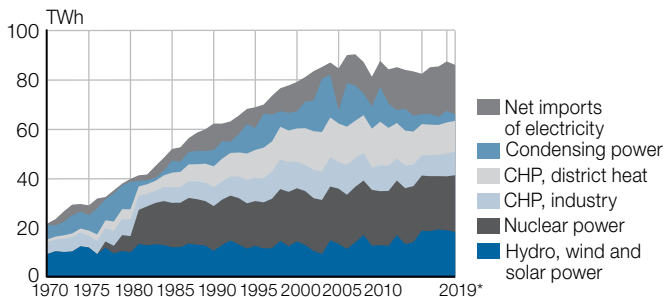
TOTAL ELECTRICITY GENERATION 2019*



ELECTRICITY PRODUCTION 2019*

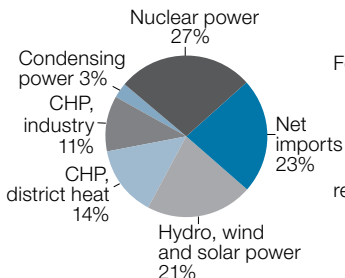


Electricity supply 1970–2019*

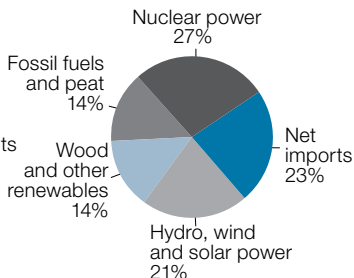


Electricity supply 2019*

By mode of production



By source



Total electricity supply in 2019* was 86.1 TWh.

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

Supply and total consumption of electricity, TWh

	Hydro power	Wind power ¹⁾	Nuclear power	Con- densing power ²⁾	CHP indus- try	CHP district heat	Net imports	Total consump- tion
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	4.7	9.2	12.7	19.9	87.5
2019*	12.3	6.2	22.9	2.6	9.6	12.4	20.0	86.1

Share

2019*	14%	7%	27%	3%	11%	14%	23%	100%
-------	-----	----	-----	----	-----	-----	-----	-------------

Annual change

18/19*	–6%	4%	5%	–45%	5%	–2%	1%	–2%
--------	-----	----	----	------	----	-----	----	------------

1) Wind power also includes the production of solar power.

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

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

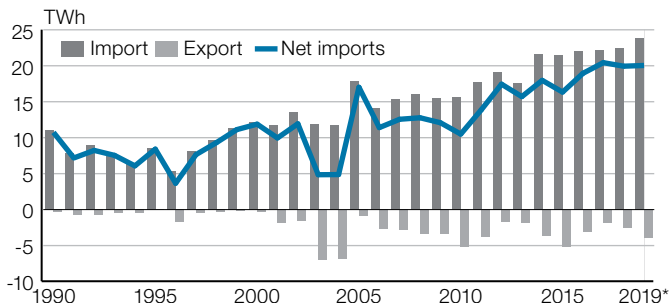
Energy sources in electricity generation, PJ

	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
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	68.6	238.7	31.1	1.7	17.3	19.1	77.0	71.8	525.3	8
2019*	66.4	250.1	22.5	1.4	16.5	15.0	73.3	72.2	517.5	6

Solar power is included in hydro and wind power.

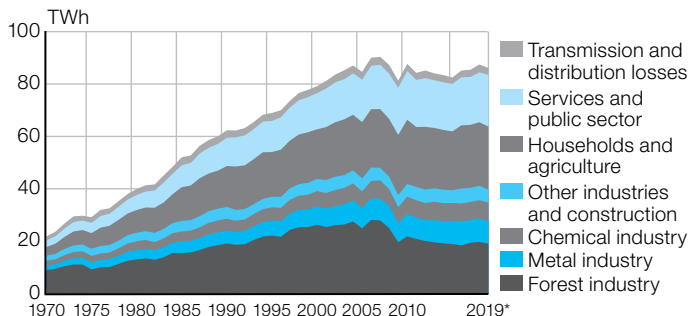
Sources: Statistics Finland, Finnish Energy and Technical Research Centre of Finland VTT (wind power)

Imports and exports of electricity 1990–2019*

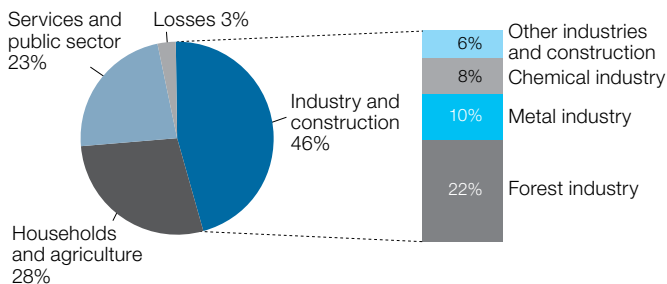


Source: Finnish Energy

Electricity consumption by sector 1970–2019*



Electricity consumption by sector 2019*



Sources: Finnish Energy and Statistics Finland

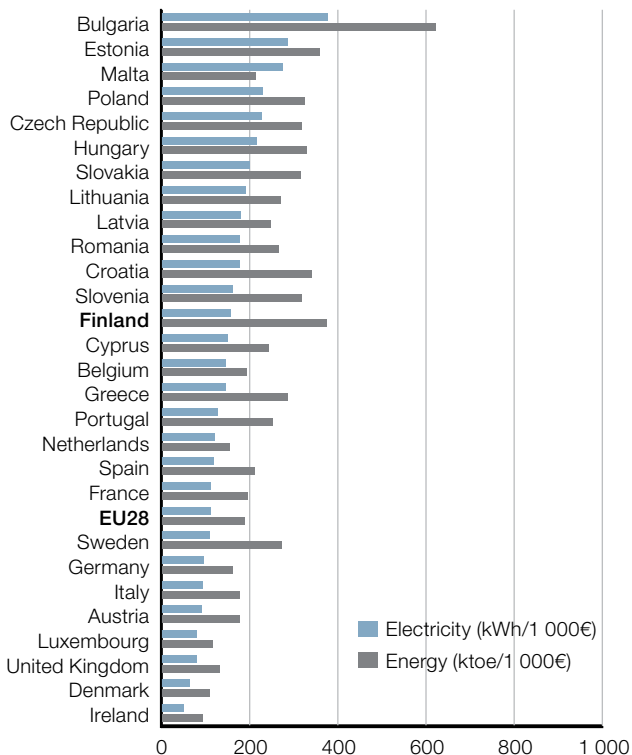
All-time record for the highest electricity consumption was 15 105 MWh on 7 January 2016 at 5 pm.

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	25.0	8.5	6.5	4.7	22.1	17.3	3.3	87.3
2009	37.6	19.6	7.2	6.1	4.7	23.0	18.0	2.8	81.3
2010	41.8	21.9	8.5	6.6	4.8	24.6	18.6	2.8	87.7
2011	40.7	20.9	8.1	6.7	5.1	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	8.4	7.1	5.2	23.0	18.2	2.6	84.1
2014	39.7	19.2	8.5	6.9	5.2	22.8	18.2	2.8	83.4
2015	39.5	18.9	8.9	6.8	4.9	22.4	18.1	2.4	82.5
2016	40.1	18.4	9.0	7.0	5.8	24.1	18.4	2.6	85.2
2017	40.4	19.4	8.7	6.9	5.4	24.0	18.3	2.8	85.5
2018	41.2	19.7	8.9	7.0	5.5	24.2	19.0	3.0	87.5
2019*	39.7	19.1	8.6	7.1	4.9	24.1	19.7	2.6	86.1
Share									
2019*	46%	22%	10%	8%	6%	28%	23%	3%	100%
Annual change									
18/19*	-4%	-3%	-4%	2%	-11%	-1%	4%	-14%	-2%

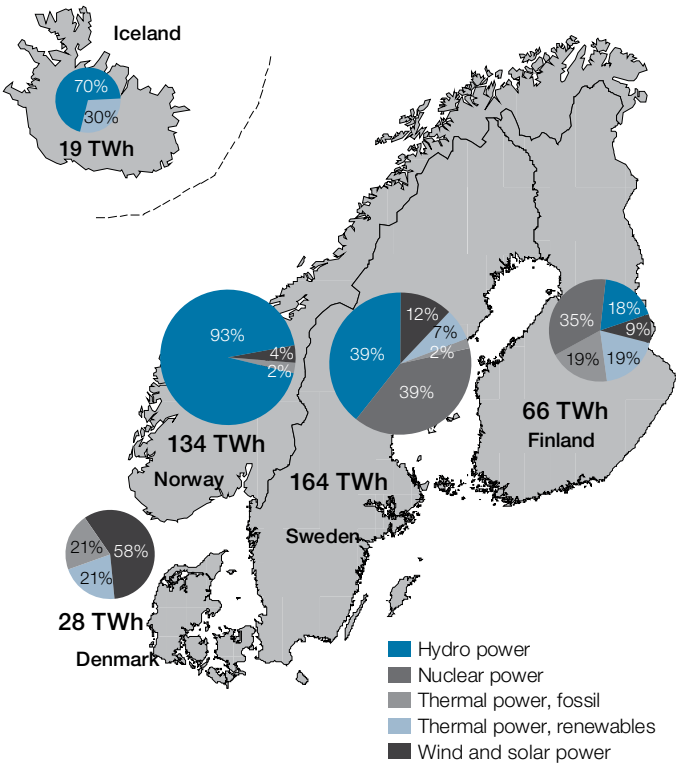
Sources: Statistics Finland, Finnish Energy, VTT Technical Research Centre of Finland

Consumption of energy and electricity per GDP-unit in EU countries 2018



Source: Eurostat

Electricity generation in the Nordic countries 2019*

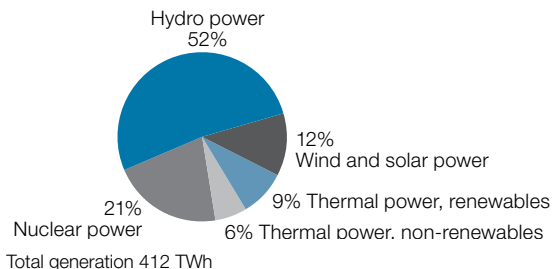


Source: Eurostat
Only 2018 data was available for Iceland.

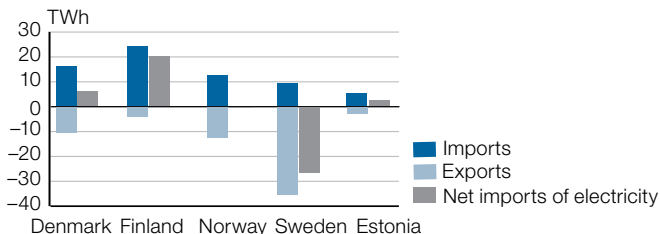
Electricity consumption in the Nordic countries, Estonia and EU28 2019*, TWh

	2018	2019	Change-%
Sweden	142	138	-3 %
Norway	136	134	-2 %
Finland	87	86	-2 %
Denmark	35	34	-1 %
Iceland (2018 data)	19	19	
Nordic countries total	420	412	-2 %
Estonia	9	9	-2 %
EU28 countries	3 151	3 110	-1 %

Total electricity generation in the Nordic countries 2019*



Imports and exports of electricity in the Nordic countries 2019*



Source: Eurostat
Only 2018 data was available for Iceland.

Electricity consumption in EU, TWh

	1990	1995	2000	2005	2010	2015	2016	2017	2018
Germany ¹⁾	481	473	501	539	547	528	531	531	525
France	323	368	410	451	472	448	455	452	449
United Kingdom	284	304	340	357	338	316	311	307	307
Italy	219	243	279	310	310	297	296	302	303
Spain	129	146	195	248	251	239	240	247	246
Poland	109	104	109	116	129	139	144	146	151
Sweden	131	127	131	133	135	128	131	130	131
Netherlands	75	85	100	108	112	109	111	112	114
Belgium	59	70	79	84	86	83	83	84	84
Finland	59	66	76	82	85	80	82	82	84
Austria	44	48	53	60	62	64	64	65	65
Czechia	53	52	52	58	58	59	60	61	61
Greece	30	36	45	53	55	52	55	56	51
Romania	60	46	41	47	46	47	47	49	50
Portugal	24	29	39	47	51	47	47	48	49
Hungary	33	29	31	36	36	38	39	40	41
Denmark	29	32	33	34	33	32	32	32	32
Bulgaria	36	31	25	27	28	30	30	31	31
Ireland	12	15	20	24	26	26	26	27	28
Slovakia	25	23	23	24	25	25	26	27	27
Croatia	14	10	12	15	16	16	16	16	17
Slovenia	9	9	11	13	12	13	13	14	14
Lithuania	13	7	7	9	9	10	11	11	11
Estonia	7	5	5	6	7	7	8	8	8
Latvia	8	4	4	6	6	6	6	6	7
Luxembourg	4	5	6	6	7	6	6	6	6
Cyprus	2	2	3	4	5	4	4	5	5
Malta	1	1	2	2	2	2	2	2	2
EU28	2 274	2 370	2 634	2 899	2 948	2 851	2 877	2 898	2 900

Until 1990 the territory of the Federal Republic of Germany

Source: Eurostat

Electricity spot prices of the nordic power exchange Nord Pool 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
2019	39.29	38.36	44.04	39.84	45.86	38.94

Development of spot prices on Nord Pool 1999–2019

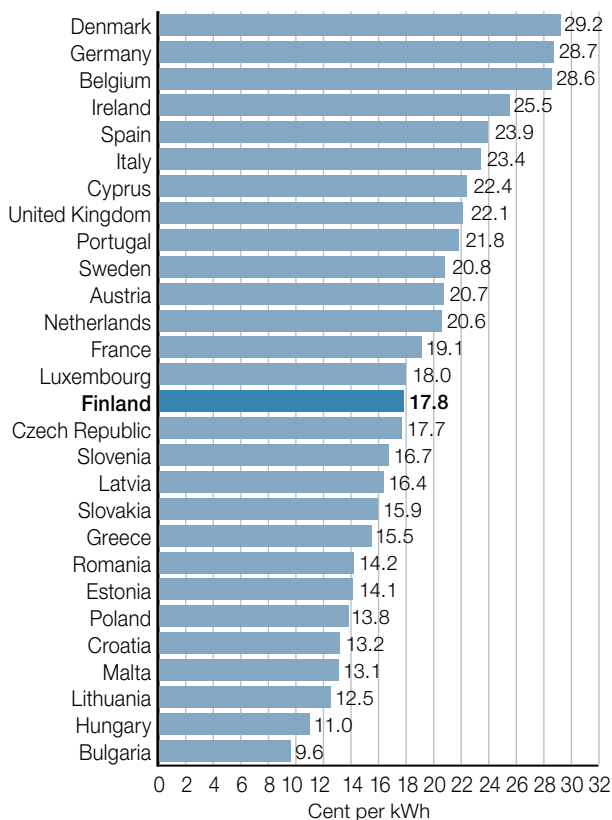


The system price is the price calculated on the basis of all bids and offers at the Power Exchange, in which possible restrictions caused by the electricity transmission capacity are not taken into account.

Source: Nord Pool

The spot price of electricity was negative in Finland for the first time on 10 February 2020 for four hours.

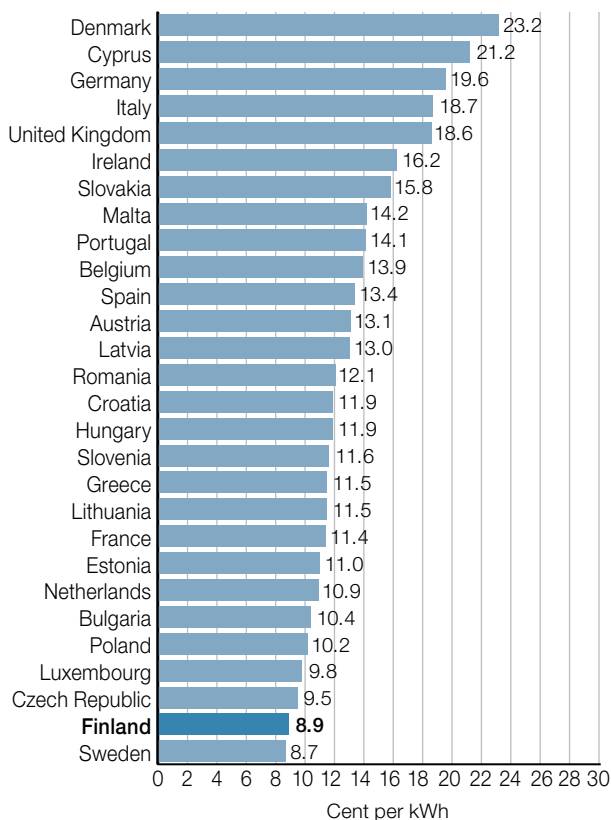
Electricity prices for households on the 2nd half of 2019



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

Source: Eurostat

Electricity prices for industry on the 2nd half of 2019



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

Source: Eurostat

Electricity network information

	1990	2000	2015	2017	2018
Transformer substations, number					
High voltage substations	715	591	944	973	982
Distribution substations	114 019	124 851	136 417	141 475	144 121
Lengths of low voltage lines (0.4 kV–1 kV), km					
Overhead lines	162 076	158 576	139 243	130 809	126 830
Cables (inc. sea cable)	45 705	63 327	102 746	115 432	12 353
Cabling rate	22%	29%	42%	47%	49%
Lengths of medium voltage lines (over 1 kV–70 kV), km					
Overhead lines	122 329	121 754	115 967	108 971	103 602
Cables (inc. sea cable)	10 586	12 116	27 144	40 466	46 728
Cabling rate	8%	9%	19%	27%	31%
Lengths of high voltage lines (110 kV–400 kV), km					
110 kV	14 000	15 050	16 231	16 352	16 410
220 kV	2 471	2 510	2 092	1 576	1 576
400 kV	3 164	3 926	5 191	5 414	5 463

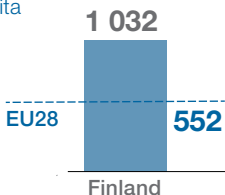
Source: Energy Authority

Of power cuts, 73 per cent were due to failures caused by storms, snow and ice in 2019.

Heating and cooling

FINAL ENERGY CONSUMPTION IN HOUSEHOLDS 2018

kgoe per capita



Source: Eurostat

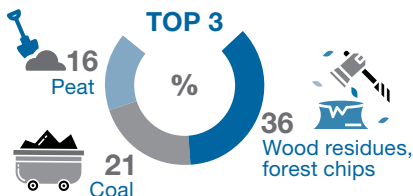
ENERGY CONSUMPTION IN HOUSEHOLDS, %



Space and
water heating

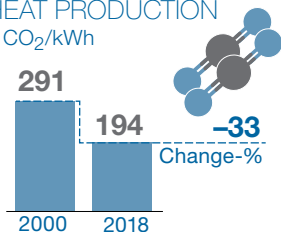
Finland **83** EU28 **79**

FUEL CONSUMPTION IN PRODUCTION OF DISTRICT HEAT 2018

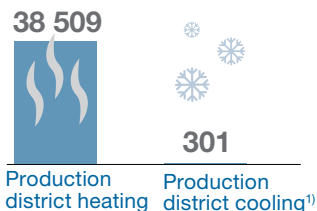


SPECIFIC CARBON DIOXIDE EMISSIONS OF DISTRICT HEAT PRODUCTION

g CO₂/kWh



DISTRICT HEATING AND COOLING, GWh



1) Source: Finnish Energy

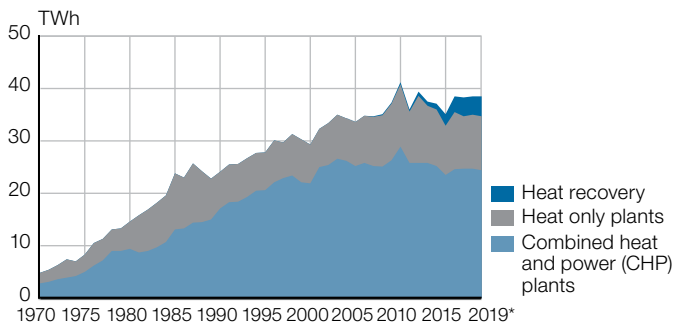
Production and consumption of district heat, TWh

	Net production of district heat			Net-work and measuring losses	Consumption of district heat			
	Heat only plants ¹⁾	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
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	13.8	24.7	38.5	3.7	18.7	3.4	12.7	34.8
2019*	14.1	24.4	38.5	3.6	18.8	3.4	12.7	34.9

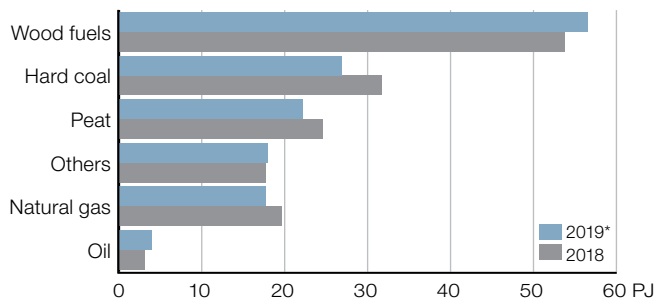
1) Heat only plants include fuel-powered heating plants and heat recovery for example from heat pumps, flue gas scrubbers and condensers. 10% of total heat production originates from heat recovery (including heat pumps).

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

Production of district heat 1970–2019*

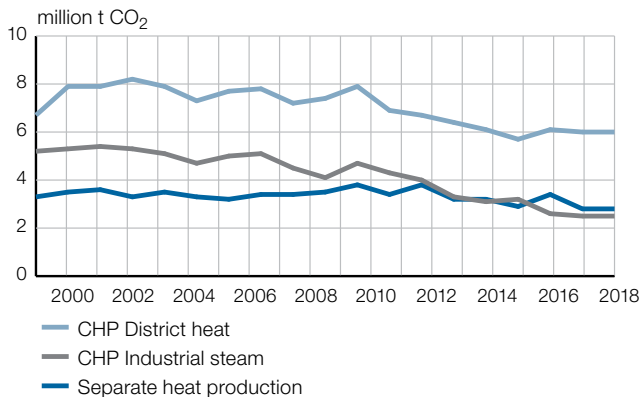


Fuel consumption in production of district heat 2018–2019*

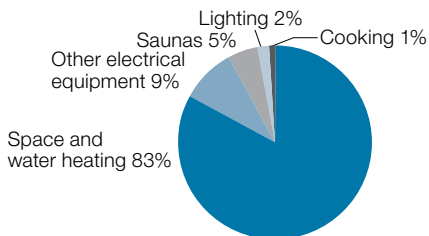


Sources: Statistics Finland, Finnish Energy

CO₂ emissions of heat production 2000–2018



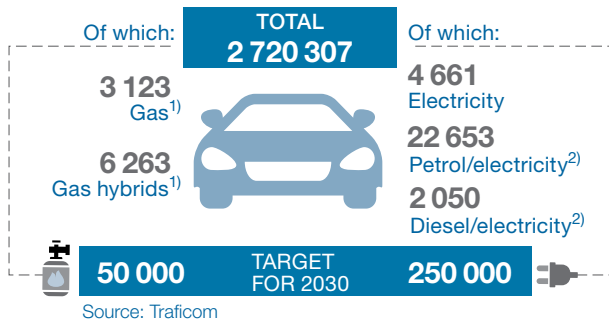
Energy consumption in households 2018



Energy consumption in households in 2018 was 236 PJ.

Transport

PASSENGER CARS IN TRAFFIC, THE END OF 2019

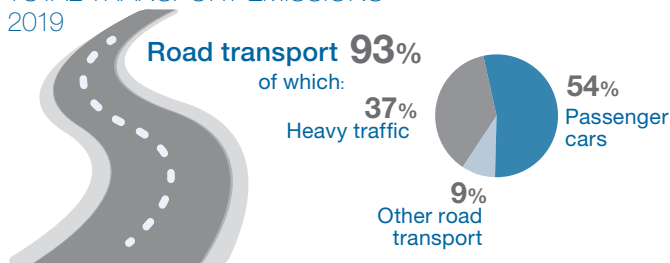


Traffic performance,
times around the world



1 257 317

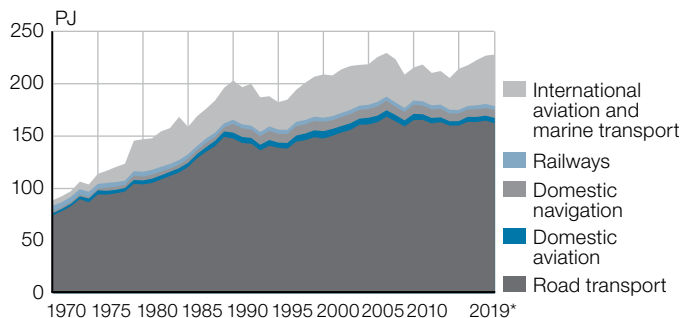
TOTAL TRANSPORT EMISSIONS 2019



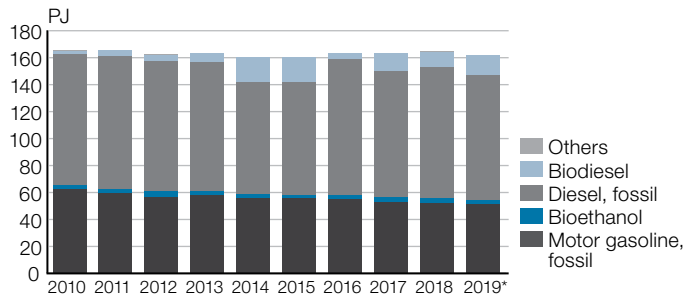
1) Does not include cars using liquefied petrol gas (LPG)

2) Plug-in hybrid

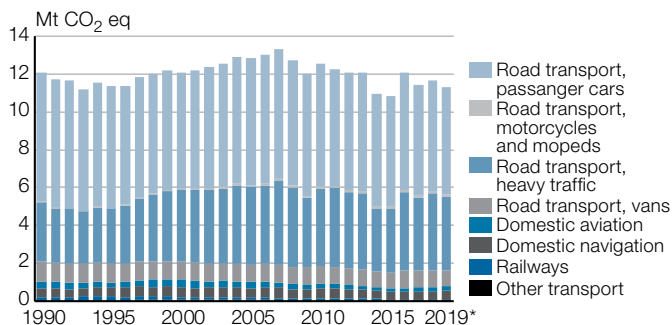
Energy consumption in transport 1970–2019*



Fuel consumption in road transport 2010–2019*



Emissions from transport 1990–2019*

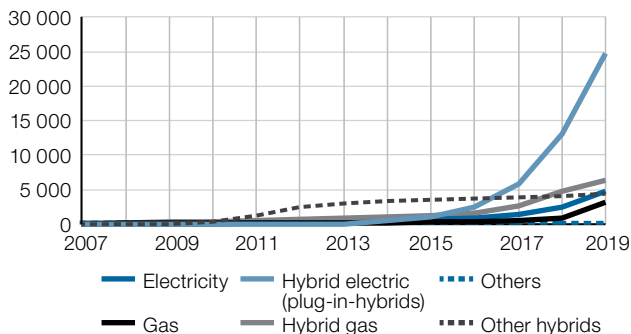


Includes emissions from fuels used in transport.

* According to Statistics Finland's instant preliminary data.

Source: Emissions data by vehicle type: VTT Lipasto

Number of electric, hybrid and gas powered passenger cars in traffic 2007–2019



Total amount of passenger cars in traffic was 2 720 307 by the end of 2019.

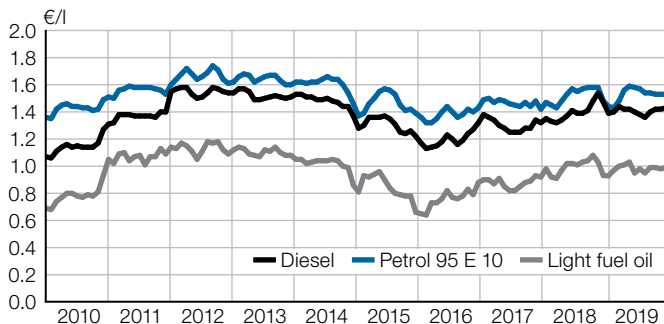
Source: Traficom

Average prices of liquid fuels in Finland, €/l

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
2019	0.98	1.40	1.52	1.61

Source: Statistics Finland, Consumer Price Index

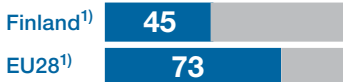
Development of liquid fuel prices in Finland 2010–2019



Source: Statistics Finland, Consumer Price Index

International fossil fuel statistics

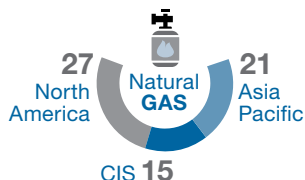
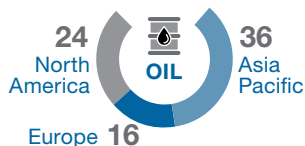
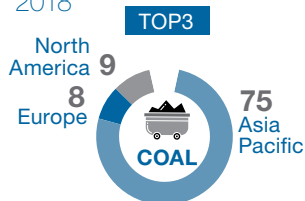
GROSS AVAILABLE ENERGY, %
2018



1) Excludes peat

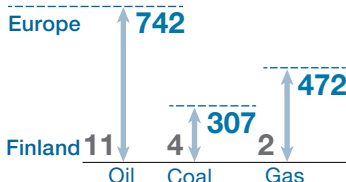
Source: Eurostat

GLOBAL CONSUMPTION, %
2018

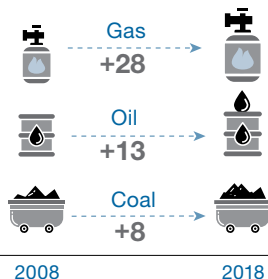


CIS Countries are Azerbaijan, Belarus, Kazakhstan, Russia, Turkmenistan, Uzbekistan, other CIS

CONSUMPTION 2018
Mtoe

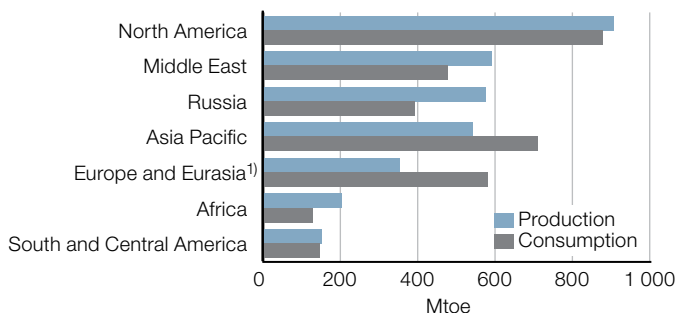


GLOBAL CONSUMPTION
2008–2018, %
10 year change

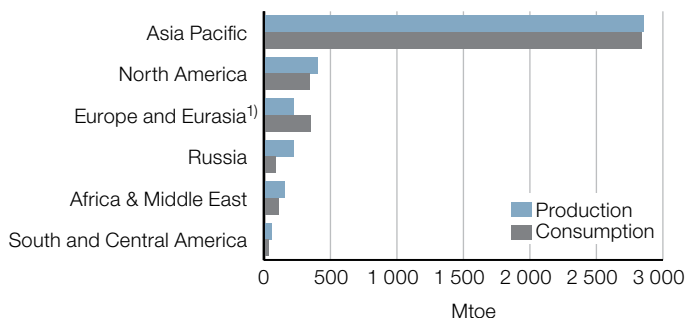


Source: BP Statistical Review of World Energy 2019

Gas production and consumption by region in 2018



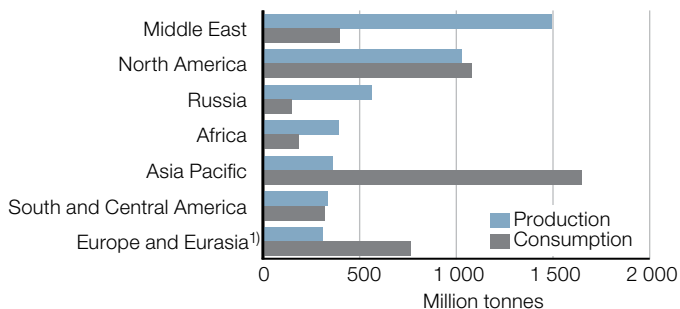
Coal production and consumption by region in 2018



1) excludes Russia

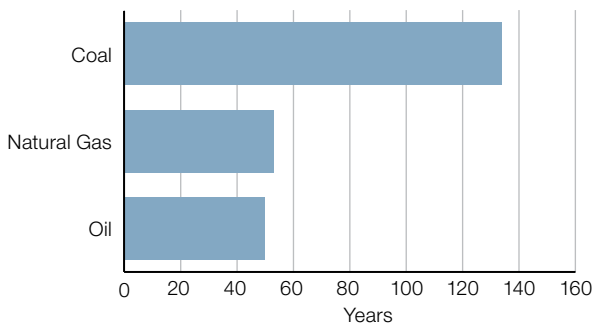
Source: BP Statistical Review of World Energy 2019

Oil production and consumption by region in 2018



1) excludes Russia

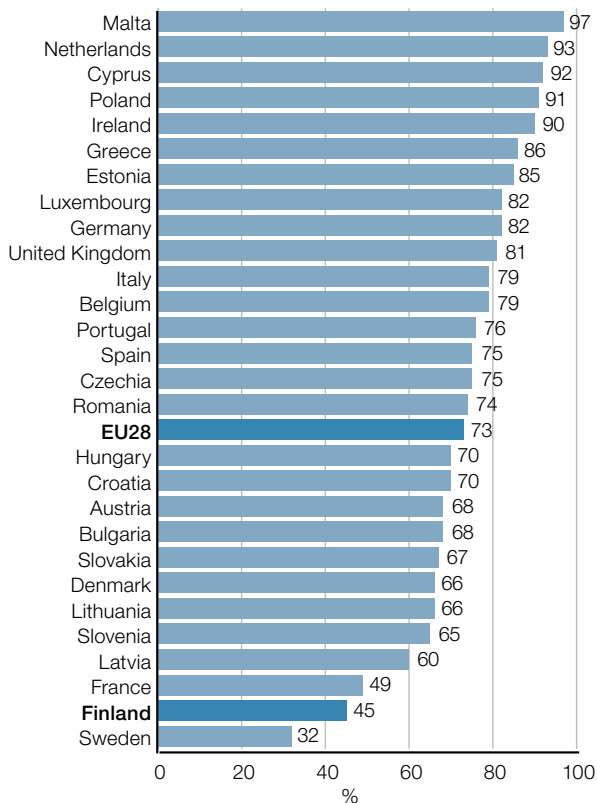
World oil, natural gas and coal reserve sufficiency



Total reserves at the end of 2018: oil 244 billion tonnes, natural gas 197 trillion m³, coal 1 055 billion tonnes.

Source: BP Statistical Review of World Energy 2019

Share of fossil fuels in gross available energy in 2018



Source: Eurostat

Industry and enterprises

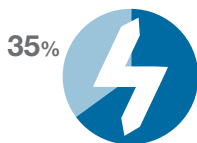
ENERGY SECTOR EMPLOYEES 2018



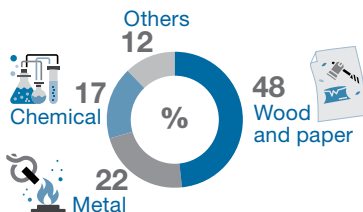
TURNOVER OF THE ENERGY SECTOR 2018



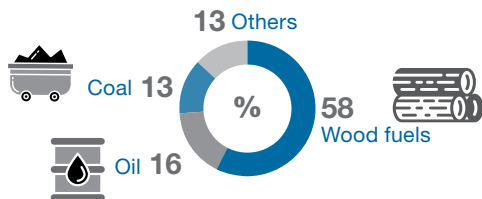
INDUSTRY OF TOTAL ENERGY CONSUMPTION 2019*



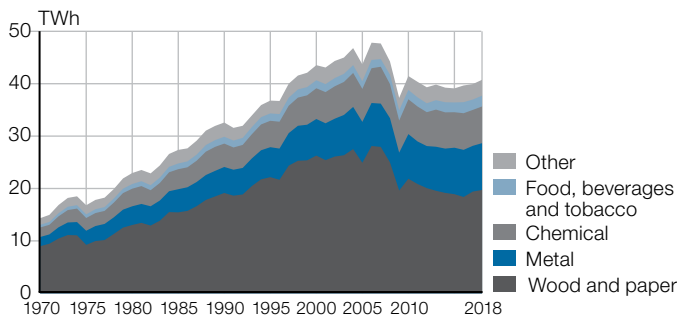
INDUSTRY ELECTRICITY CONSUMPTION 2018



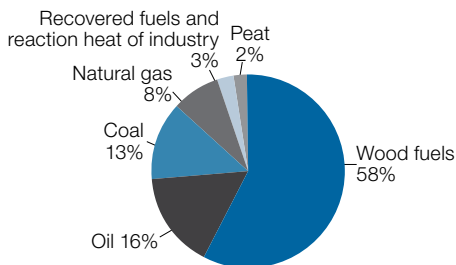
INDUSTRY FUEL CONSUMPTION 2018



Electricity consumption by branch of industry 1970–2018



Fuel consumption in industry 2018



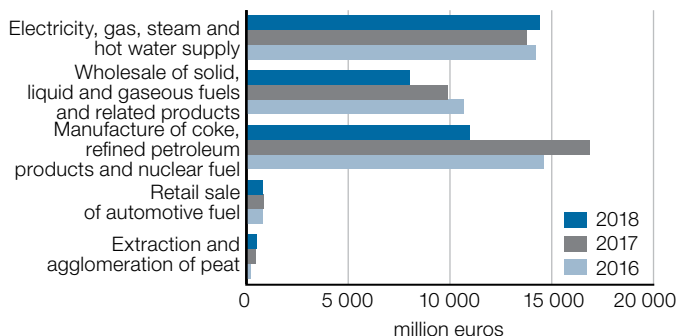
Total fuel consumption in industry in 2018 was 386 PJ.

In manufacturing: Energy use was highest in South Karelia and total electricity use was highest in Lapland in 2018.

Enterprises in energy sector in 2018

	Turnover, EUR mil.	Staff expenses, EUR mil.	Number of enter- prises	Employ- ees
Electricity, gas, steam and hot water supply	14 429	851	907	12 173
Manufacture of coke, refined petroleum products and nuclear fuel	10 977	327	14	3 753
Wholesale of solid, liquid and gaseous fuels and related products	8 012	70	118	868
Retail sale of automotive fuel	821	106	648	3 253
Extraction and agglomeration of peat	509	64	452	1 511
Total	34 747	1 417	2 139	21 558

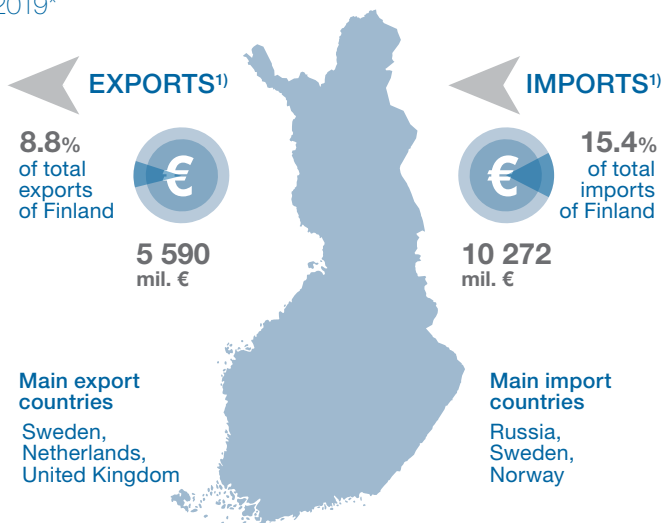
Turnover of enterprises in energy sector 2016–2018



Source: Statistics Finland, Financial statements of enterprises.

Imports and exports

TOTAL ENERGY PRODUCTS 2019*



1) Source: Finnish Customs / Foreign Trade Statistics

ENERGY DEPENDENCE²⁾ 2018



FINLAND 45% while

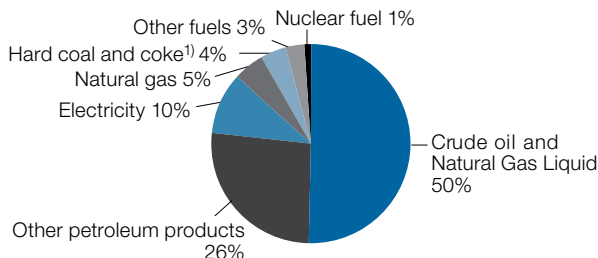


EU28 56%

2) Nuclear energy is counted as domestic energy.

Source: Eurostat

Value of energy imports 2019*



1) includes coking coal

Total imports of energy products were 10 272 million euros in 2019*. That was 15.4% of total imports to Finland.

Energy imports 2019*

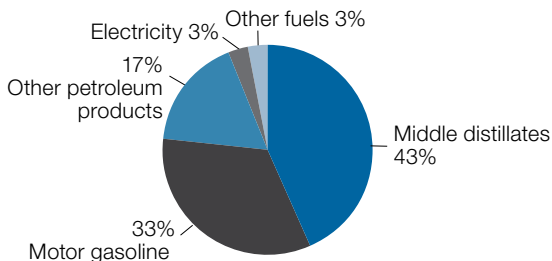
	Unit	Russia	Sweden	Norway	Other countries	Total Amount	Total Value mil. €
Coal and coal products	1000 t	2 007	0	0	1 391	3 398	431
Natural gas	mil. m ³	2 289	–	–	0	2 289	512
Oil and petroleum products ¹⁾	1000 t	13 574	1 639	1 312	1 269	17 794	7 951
Peat	1000 t	41	8	–	5	54	2
Wood fuels ²⁾	1000 t	74	0	–	26	101	13
Nuclear fuel	tU	21	17	–	18	56	86
Electricity	TWh	8	16	0	0	24	1 078
Value	€ mil.	6 574	1 764	629	1 306		10 272

1) Includes natural gas condensate

2) Includes wood pellets and other wood fuels

Source: Finnish Customs/ Foreign Trade Statistics

Value of energy exports 2019*



Total exports of energy products were 5 590 million euros in 2019*. That was 8.8% of total exports from Finland.

Energy exports 2019*

	Unit	Sweden	Nether-lands	United King- dom	Other coun-tries	Total Amount	Total Value mil. €
Coke ¹⁾	1000 t	117	38	4	42	201	49
Petroleum products	1000 t	2 253	1 063	710	4 369	8 394	5 310
Peat	1000 t	6	5	—	46	57	9
Wood fuels ²⁾	1000 t	5	0	—	24	30	5
Electricity	TWh	0	—	—	4	4	181
Value	€ mil.	1 668	519	396	3 006		5 590

1) Includes coke tar

2) Includes wood pellets and other wood fuels

Source: Finnish Customs/ Foreign Trade Statistics

Net heat contents and densities of energy sources

Fuels	Unit	Net heat content		Density t/m ³
		GJ	MWh	
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
Light fuel oil	t	43.2	12	0.83
Diesel oil	t	42.7	11.9	0.81
Kerosenes	t	43.3	12	0.79
Other kerosines	t	43.1	12	0.83
Naphtha	t	44.3	12.3	0.7
Motor gasoline	t	41.9	11.6	0.74
Aviation gasolines	t	43.7	12.1	0.71
LPG	t	46.3	12.9	0.52
Refinery gases	t	50	13.9	
Hard coal	t	24.8	6.9	
Coke	t	29.3	8.1	
Natural gas	1 000 m ³ (0°C)	36.4	10.1	
Coke oven gas	1 000 m ³	16.7	4.6	
Blast furnace gas	1 000 m ³	3.8	1.1	
Milled peat	t	10.1	2.8	0.32
Sod peat	t	12.3	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 m ³	17.0–28.0	10	

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	67.0	Default bio share 9%
Diesel fuel	65.8	Default bio share 11%
Light fuel oil	73.1	
Heavy fuel oil	79.2	
Kerosenes	73.2	
LPG	64.9	
Other oils	71.3–79.2	
Hard coal	92.7	
Coke	107	
Natural gas	55.3	
Milled peat	107.6	
Bark, wood fuel	112	
Industrial wood residue	112	
Black liquor	95.3	

Source: Statistics Finland/Fuel classification 2019

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/energia2019/.

Energy in Finland

Statistical pocketbook on energy statistics.

www.tilastokeskus.fi/energia



" FOLLOW US
– NEWS NOTIFICATIONS,
SOCIAL MEDIA "

STATISTICS FINLAND

- Compiles statistics concerning social conditions
- Supports decision-making based on facts
- Produces reliable and up-to-date information
- Promotes the use of statistical data

GUIDANCE AND INFORMATION SERVICE

+358 29 551 2220

info@stat.fi

www.stat.fi

Communications and networks
Statistics Finland
tel. +358 29 551 2220
www.stat.fi

ISSN 2242–9085 (pdf)
ISBN 978–952–244–659–6 (pdf)
ISSN 1457–0491 (print)
ISBN 978–952–244–658–9 (print)
Product number 3055 (print)

Publication orders:
Customer service, PunaMusta Oy
tel. +358 10 2308 365
verkkokauppa@punamusta.com