



Statistics Finland 

Energy in Finland

2021

Finland in brief

Area

Situated in northern Europe with an area of 338 462 km² of which 75% forest, 10% water, 7% cultivated land.

Source: Statistics Finland, Natural Resources Institute Finland

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.

Source: Statistics Finland

Average temperatures in 2020

Town	Latitude	January	July
Helsinki	60°	3.0°C	16.7°C
Sodankylä	67°	-9.4°C	15.0°C

Source: Finnish Meteorological Institute

Economy

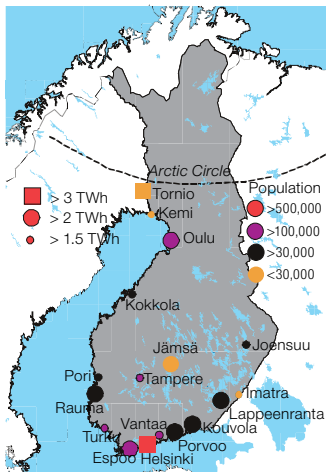
In 2020* GDP totalled € 237.5 bil., i.e. € 42 936/capita. In 2020* services were 69.4%, secondary production 27.8% and primary production 2.8% of the GDP.

Structure of industry, Value added gross in production in 2020*

	bil. €	%
Total industry	41.4	100
Mining and quarrying	1.0	2
Forest industry	3.8	9
Chemical industry	5.9	14
Metal industry	19.1	46
Basic metals and metal prod.	4.3	10
Electrical and electronics ind.	6.5	16
Other metal industry	8.3	20
Other manufacturing ind.	5.4	13
Energy supply	4.4	11
Water supply and waste management	1.9	5

Source: Statistics Finland

Municipalities with high electricity consumption 2019



Source: Statistics Finland, Finnish Energy

Productive forestland is the most valuable natural resource of Finland. The indigenous energy resources in the country are wood fuels, hydro power, peat and wind power. Finland also has some rich deposits of metallic ores from which copper, zinc, and nickel are extracted.

Total energy consumption in 2020*

1 281 PJ (30.6 Mtoe)
232 GJ/capita (5.5 toe/capita)

Source: Statistics Finland

CO₂ emissions in energy sector in 2020*

34.7 million t CO₂

Source: Statistics Finland

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The data in this pocketbook are based on the Preliminary Energy Statistics 2020 figures.

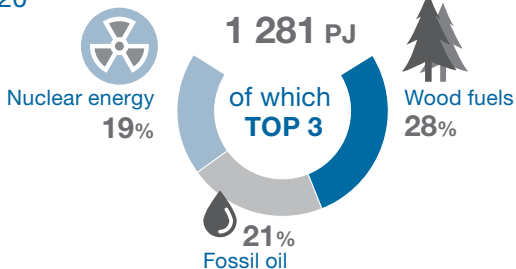
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Cover photograph: Shutterstock
Cover design and layout: Hilikka Lehtonen, Statistics Finland
Printed by: PunaMusta Oy, Helsinki 2021

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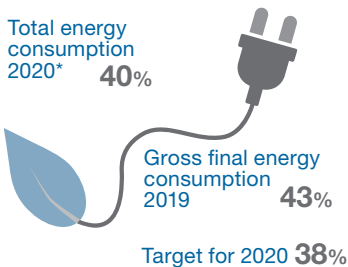
Total energy consumption

Total energy consumption 2020*

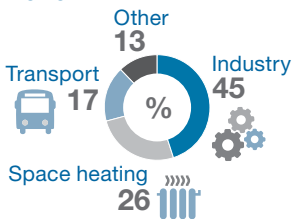


Renewable energy

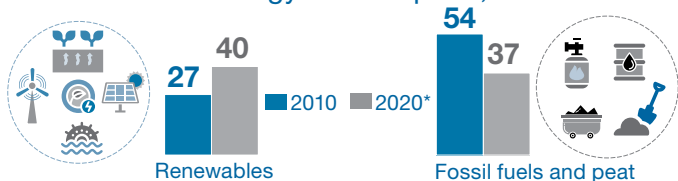
Total energy consumption 2020* **40%**



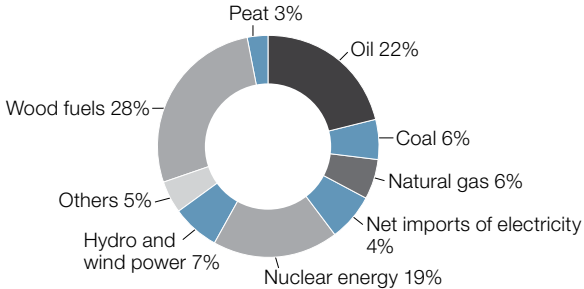
Final energy consumption 2020*



Shares in total energy consumption, %

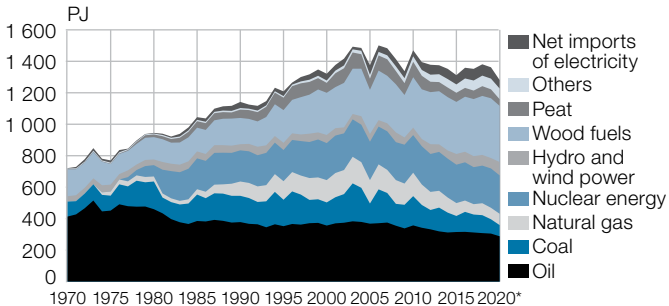


Total energy consumption by energy source in 2020*, %



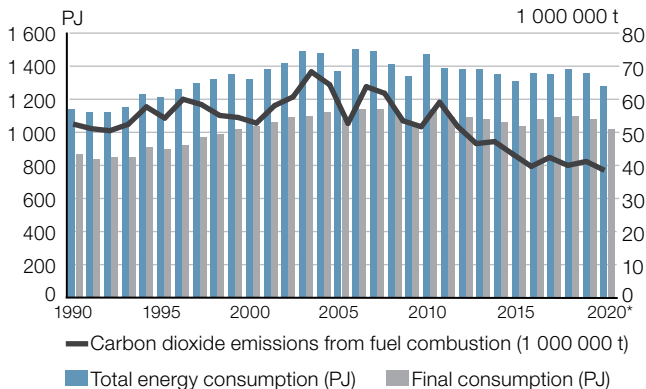
Total energy consumption in 2020* was 1 281 PJ.

Total energy consumption by energy source 1970–2020*, PJ

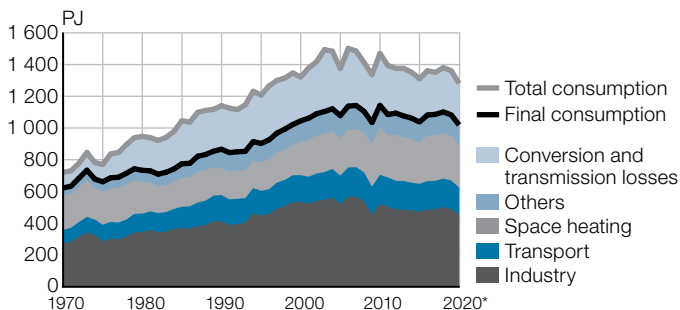


Oil includes transport biofuels.

Energy consumption and carbon dioxide emissions from fuel combustion 1990–2020*, PJ and 1 000 000 t



Total energy consumption and final energy consumption by sector 1970–2020*, PJ



Primary energy consumption in EU27, PJ

	1990	1995	2000	2005	2010	2015	2018	2019
Germany	13 927	13 287	13 278	13 465	13 195	12 390	12 231	11 836
France	8 920	9 384	10 010	10 924	10 653	10 230	10 004	9 850
Italy	5 766	6 339	6 955	7 571	7 004	6 244	6 165	6 108
Spain	3 451	3 963	4 795	5 696	5 145	4 942	5 216	5 056
Poland	4 150	4 022	3 552	3 683	4 043	3 770	4 229	4 109
Netherlands	2 449	2 736	2 803	2 935	3 003	2 675	2 689	2 657
Belgium	1 910	2 020	2 195	2 159	2 269	1 927	1 965	2 056
Sweden	1 901	2 026	1 924	2 051	2 024	1 835	1 978	1 917
Czechia	2 018	1 651	1 639	1 780	1 781	1 651	1 695	1 666
Austria	993	1 084	1 151	1 370	1 376	1 325	1 332	1 348
Finland	1 139	1 175	1 324	1 405	1 484	1 306	1 371	1 342
Romania	2 611	1 907	1 460	1 510	1 379	1 287	1 364	1 339
Hungary	1 147	1 022	990	1 103	1 031	975	1 025	1 029
Greece	901	963	1 137	1 268	1 140	979	947	933
Portugal	633	780	961	1 040	948	906	949	924
Bulgaria	1 121	927	739	805	728	752	769	763
Denmark	737	825	800	814	838	709	730	704
Slovakia	823	705	685	729	697	637	661	669
Ireland	404	429	573	626	616	584	614	614
Croatia	374	297	326	383	371	333	342	344
Slovenia	240	250	265	304	294	266	278	273
Lithuania	642	345	274	337	258	243	267	263
Estonia	393	217	191	211	233	223	254	197
Latvia	330	192	159	188	191	179	196	191
Luxembourg	146	137	151	200	193	173	187	188
Cyprus	66	80	98	104	112	95	107	106
Malta	32	33	34	38	39	31	35	37
EU27	57 222	56 798	58 469	62 698	61 046	56 670	57 598	56 520
United Kingdom ¹⁾	8 422	8 832	9 293	9 357	8 587	7 645	7 420	7 297

1) The United Kingdom was a member state of the European Union until 31 January 2020.

Source: Eurostat

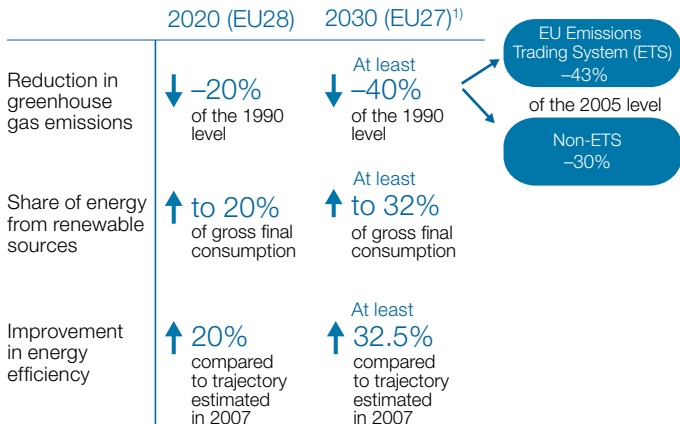
Total energy consumption by energy source, PJ

	Oil	Coal	Natural gas	Nuclear energy	Hydro power	Wind power
1970	412.9	94.8	0.0	0.0	33.9	0.0
1975	451.0	94.8	26.5	0.0	43.5	0.0
1980	460.3	176.2	32.2	72.3	36.4	0.0
1985	385.3	167.8	34.1	196.1	44.0	0.0
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	0.6
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	338.4	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	319.0	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	127.0	72.3	243.1	56.3	11.0
2017	311.7	114.1	66.0	235.4	52.6	17.3
2018	308.4	114.1	75.6	238.7	47.3	21.0
2019	305.2	91.1	73.3	250.0	44.1	21.7
2020*	287.6	71.0	72.2	243.9	56.2	28.7
Share						
2020*	22%	6%	6%	19%	4%	2%
Annual Change						
19/20*	-6%	-22%	-1%	-2%	28%	32%

Oil includes transport biofuels.

Wood fuels	Peat	Others	Net imports of electricity	Total	
170.1	0.9	6.0	1.9	720.5	1970
130.7	1.7	7.2	14.4	769.8	1975
142.1	17.1	6.0	4.4	946.9	1980
151.3	41.1	9.1	17.0	1 045.8	1985
167.2	53.3	9.8	38.7	1 141.4	1990
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
305.9	84.1	30.2	46.0	1 413.2	2008
269.9	74.8	32.2	43.5	1 336.4	2009
321.2	97.8	35.3	37.8	1 470.1	2010
316.4	85.6	36.7	49.9	1 394.4	2011
330.5	66.4	44.6	62.8	1 375.9	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	1 360.5	2016
362.8	53.9	64.2	73.5	1 351.4	2017
374.7	61.9	66.8	71.8	1 380.3	2018
380.1	56.7	67.7	72.2	1 362.1	2019
356.7	42.5	67.9	53.8	1 280.5	2020*
					Share
28%	3%	5%	4%	100%	2020*
					Annual Change
-6%	-25%	0%	-25%	-6%	19/20*

Joint EU climate and energy targets for 2020 and 2030



1) Targets for 2030 do not take into account the most recent proposal by the European Commission. In July 2021, the European Commission proposed a legislative package aiming for at least 55% reduction in greenhouse gas emissions in the EU from 1990 levels by 2030. The proposed legislative package would thus tighten the current EU reduction target of 40%. The proposed package also seeks to upgrade renewable energy and energy-efficiency targets.

Source: Suomen kasvihuonekaasupäästöt 1990–2020 (Finland's Greenhouse Gas Emissions 1990–2020, in Finnish) http://www.stat.fi/tup/julkaisut/tiedostot/julkaisuluettelo/yymp_kahup_1990-2020_2021_23462_net.pdf

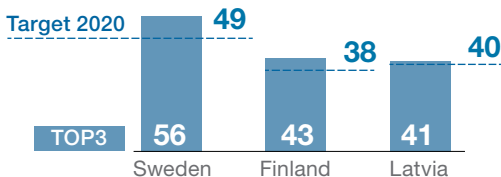
Aim of the Government Programme (2019):
Finland to be carbon neutral in 2035.

Renewable energy

Overall shares, %

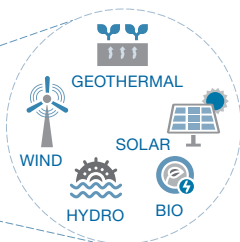
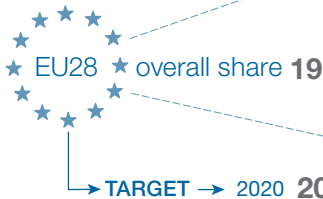
2019

EU28
overall share



Energy from renewable sources, %

2019

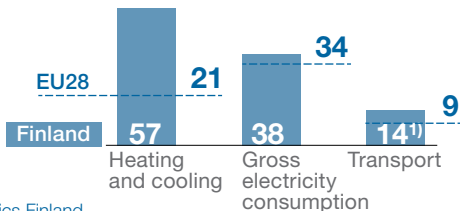


1) The target for 2030 does not take into account the most recent proposal by the European Commission (July 2021) which seeks to further raise the EU-level target for renewable energy sources.

Sectoral RES shares, %

2019

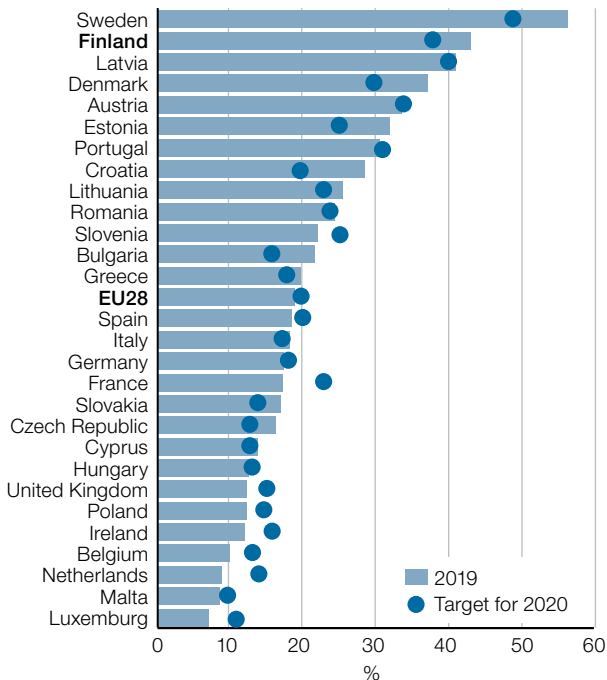
Share of energy



1) Corrected by Statistics Finland

Source: Eurostat/Shares, Statistics Finland

Shares of renewable energy in gross final energy consumption in 2019 and the country-specific EU targets for 2020, %



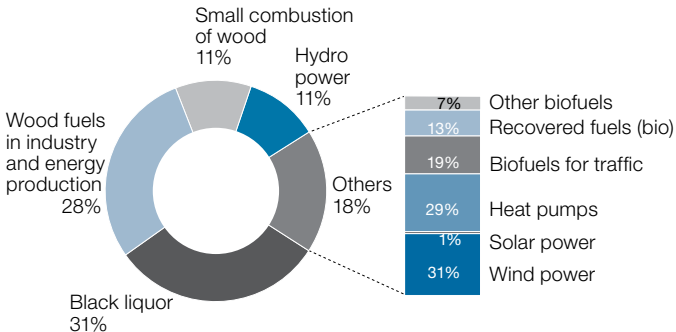
This indicator is calculated on the basis of data covered by Regulation (EC) No 1099/2008 on energy statistics. Reporting countries provide additional information on renewable source not covered by the Regulation. This indicator may be considered an estimate of the indicator described in Directive 2009/28/EC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

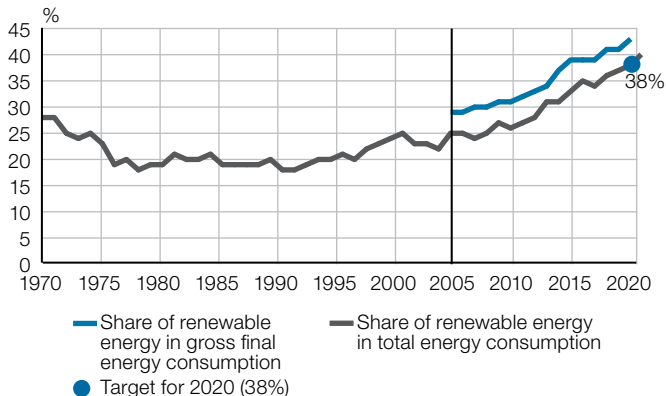
	Hydro power	Wind power	Wood fuels in industry and energy production	Black liquor	Small combustion of wood	Heat pumps	Others	Total	Share of total energy consumption (%)
1980	36.4	–	31.1	67.4	43.6	0.4	..	178.9	19
1990	38.7	0.0	36.5	86.1	44.7	1.2	0.3	207.4	18
2000	52.0	0.3	84.7	137.9	45.3	1.5	3.1	325.2	25
2010	45.9	1.1	116.4	135.7	69.2	10.4	15.9	395.8	27
2011	44.2	1.7	122.4	135.1	58.9	12.0	19.2	394.4	28
2012	60.0	1.8	130.2	135.8	64.6	15.7	20.8	430.0	31
2013	45.6	2.8	136.3	140.7	61.5	16.1	24.3	428.4	31
2014	47.7	4.0	135.2	141.9	62.3	17.8	36.0	446.1	33
2015	59.7	8.4	130.5	142.1	58.4	17.3	36.4	454.6	35
2016	56.3	11.0	140.3	146.3	63.5	21.3	25.1	466.0	34
2017	52.6	17.3	145.7	154.8	62.4	23.0	35.0	493.0	36
2018	47.3	21.0	146.2	167.0	61.4	23.8	34.8	504.5	37
2019	44.1	21.7	149.9	169.7	60.4	25.1	37.6	511.1	38
2020*	56.2	28.1	141.7	158.1	56.5	25.8	36.0	505.0	40

Renewable energy in 2020*, %



The divisions of the group Others are partly based on data for 2019. The total consumption of renewable energy in 2020* was 505 PJ which is 40% of total energy consumption. The figure differs from the EU target, which is calculated from final energy consumption.

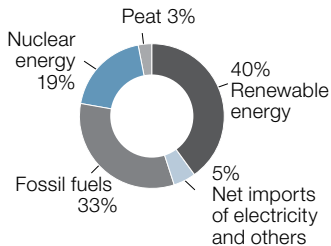
Share of renewable energy in total energy consumption (1970–2020*) and gross final energy consumption (2004–2019) and target for 2020, %



Share of renewable energy in gross final energy consumption in 2019 was 43%.

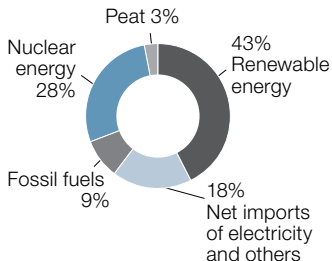
Shares of renewable energy in 2020*, %

In total energy consumption



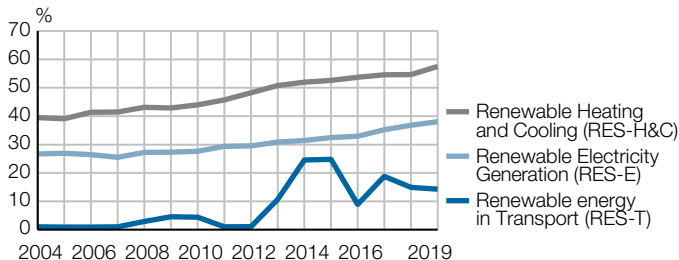
Total 1 277 PJ

In electricity supply

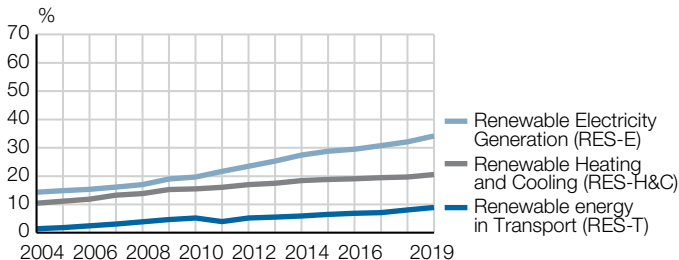


Total 81 TWh

Renewable energy indicators: Share of renewable energy by sectors 2004–2019 in Finland ¹⁾, %



Renewable energy indicators: Share of renewable energy by sectors 2004–2019 in EU28 ¹⁾, %



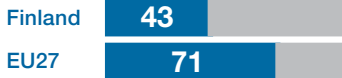
1) This indicator is based on the definitions included in the Directive 2009/28/EC (Renewable Energy Directive) on the promotion of the use of energy from renewable sources.

Source: European Commission

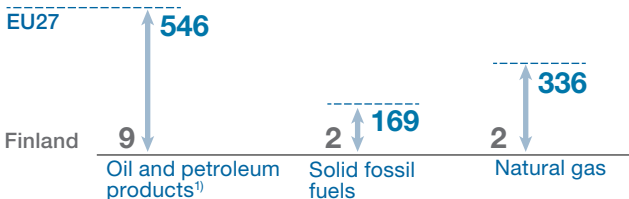
Renewable energy surpassed fossil fuels and peat in total energy consumption in Finland in 2020.

Fossil fuels

Gross available energy, % 2019

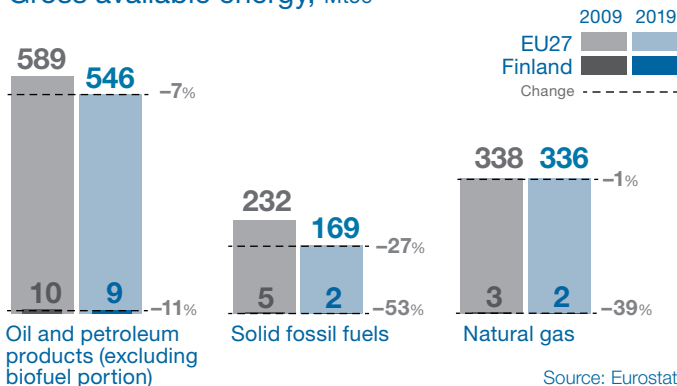


Consumption 2019 Mtoe



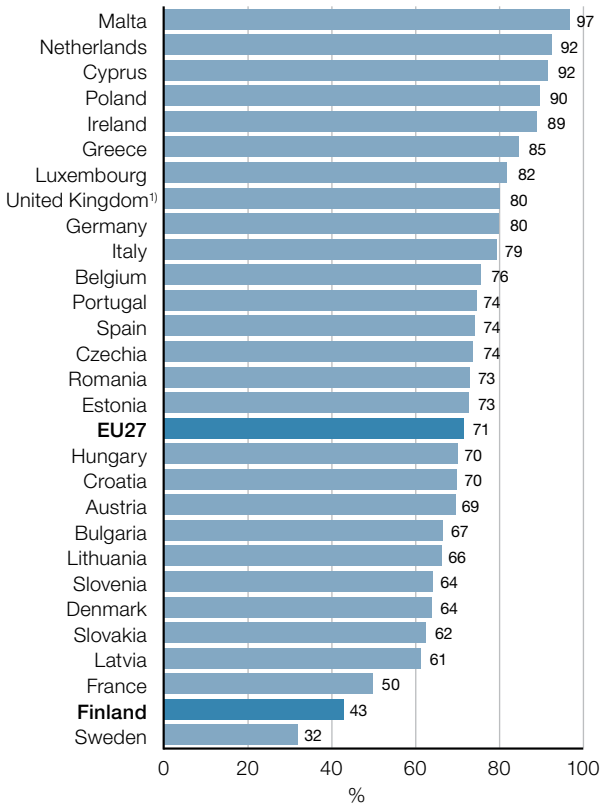
1) excluding biofuel portion

Gross available energy, Mtoe



Source: Eurostat

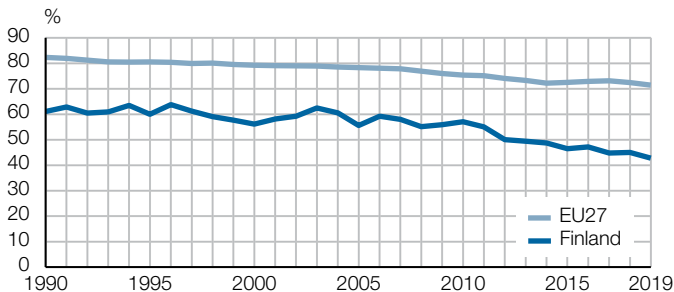
Share of fossil fuels in gross available energy in 2019, %



1) The United Kingdom was a member state of the European Union until 31 January 2020.

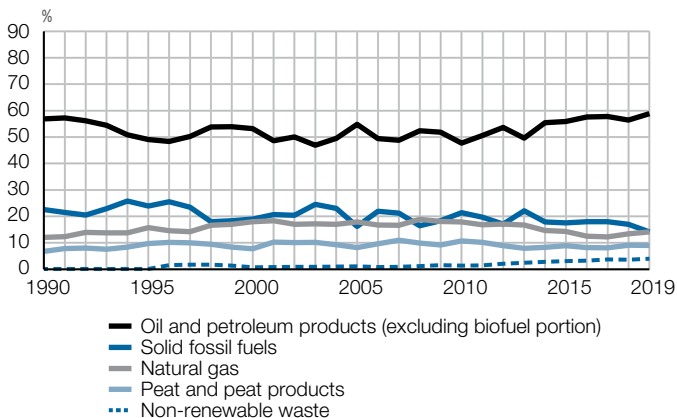
Source: Eurostat

Share of fossil fuels in gross available energy 1990–2019, %



Source: Eurostat

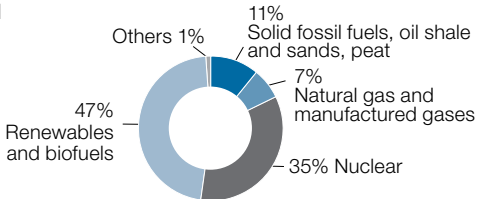
Share of fossil fuels in gross available energy in Finland 1990–2019, %



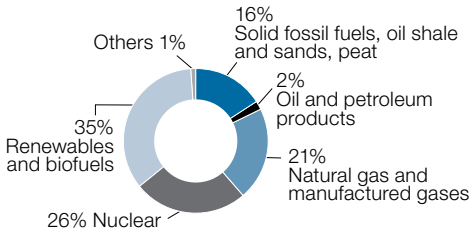
Source: Eurostat

Electricity production by fuel source in 2019, %

Finland



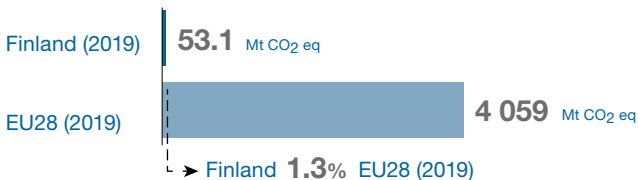
EU27



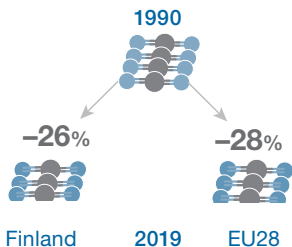
Source: European Commission

Greenhouse gases

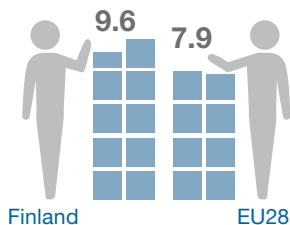
Total emissions¹⁾



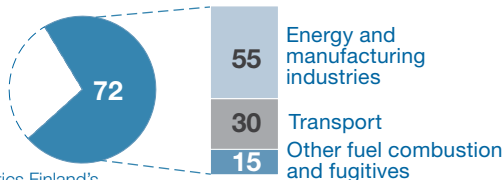
Total emissions¹⁾ between 1990 and 2019



Total emissions¹⁾ per capita 2019 tonnes



Energy sector emissions of total emissions¹⁾ in Finland, % 2020*



*According to Statistics Finland's instant preliminary data

1) Without LULUCF

Source: EEA and Statistics Finland

Greenhouse gas emissions 1990–2020*

The gases included in the Kyoto Protocol

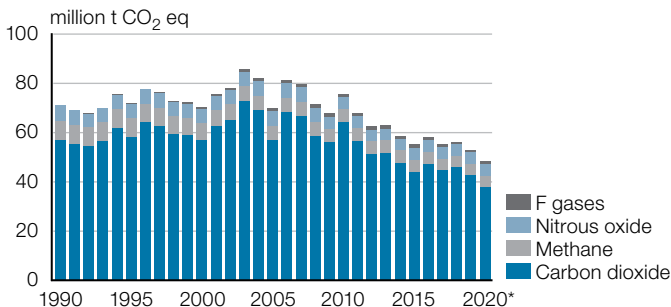
	1990	1995	2000	2005	2010	2015	2018	2019	2020*
	million tonnes of CO ₂ equivalent								
Energy	53.5	55.3	53.7	53.7	60.2	40.6	42.1	39.1	34.7
Industrial processes and product use	5.4	5.1	6.0	6.8	6.2	5.8	5.8	5.5	5.2
Agriculture	7.5	6.7	6.6	6.5	6.7	6.6	6.5	6.6	6.6
Waste	4.7	4.6	3.8	2.8	2.6	2.1	1.8	1.8	1.7
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	56.3	53.1	48.3
Land use, land use change and forestry	-13.5	-13.3	-15.1	-20.5	-20.8	-17.9	-8.2	-14.7	-23.0

* Finland's instant preliminary data

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

Source: Statistics Finland, Greenhouse Gas Inventory

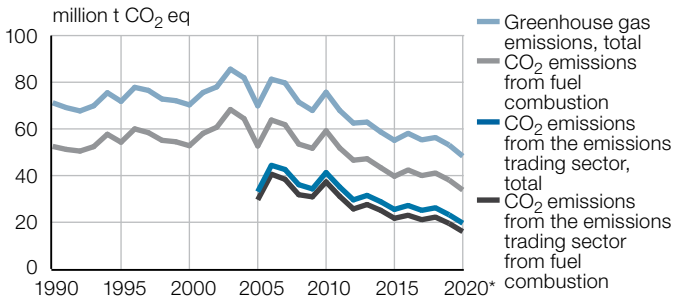
Greenhouse gas emissions by gases 1990–2020*



* Finland's instant preliminary data

Source: Statistics Finland, Greenhouse Gas Inventory

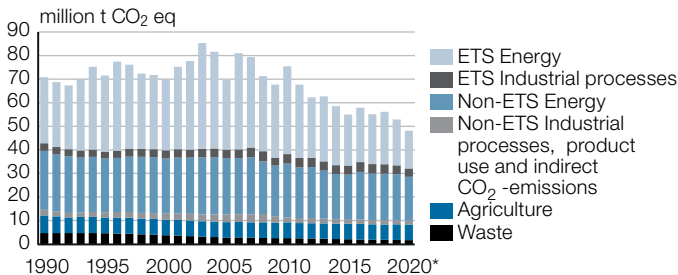
Finland's greenhouse gas emissions 1990–2020*



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 1990–2020*



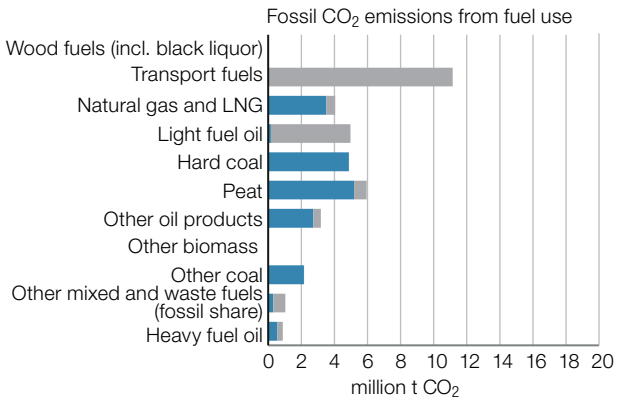
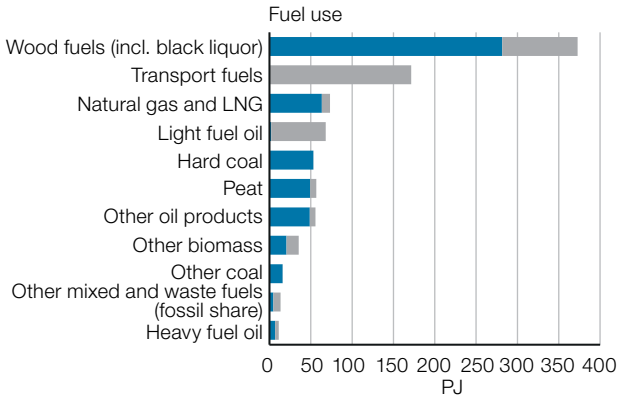
ETS = Emissions Trading System emissions,

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.

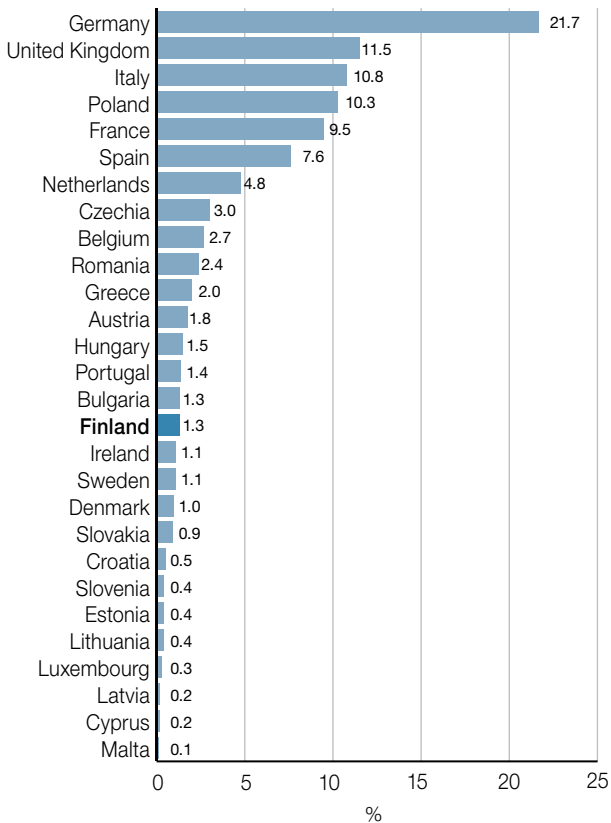
Fuel use and emissions of the emissions trading sector and emissions not included in the EU ETS by fuel type in 2019*



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

■ Emissions not included in the EU Emissions Trading System

Share in the EU's energy sector greenhouse gas emissions in 2019



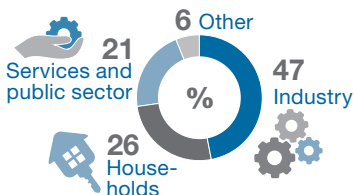
Source: European Environment Agency

Electricity

Total electricity consumption 2019

86085 GWh

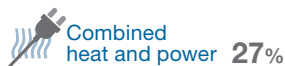
→ Of which



Total electricity consumption increase 1980–2020*



Total electricity generation 2020*



Electricity production 2020*

TOP3

Renewables



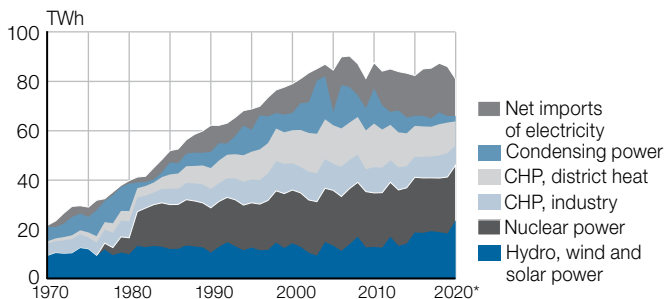
Nuclear power



Hard coal

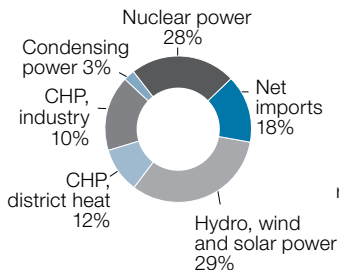


Electricity supply 1970–2020*, TWh

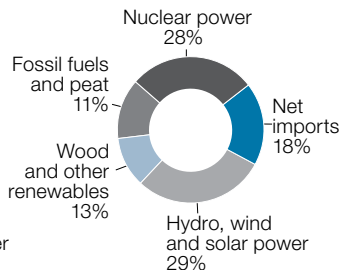


Electricity supply in 2020*, %

By mode of production



By source



Total electricity supply in 2020* was 81.1 TWh

Sources: Statistics Finland, Finnish Energy, VTT Technical Research Centre of Finland (wind power until 2011)

Supply and total consumption of electricity, TWh

	Hydro power	Wind power ¹⁾	Nuclear power	Con- densing power ²⁾	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	4.7	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
2020*	15.6	8.2	22.4	2.2	8.1	9.7	14.9	81.1
Share								
2020*	19%	10%	28%	3%	10%	12%	18%	100%
Annual Change								
19/20*	27%	34%	–2%	–16%	–16%	–22%	–25%	–6%

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, VTT Technical Research Centre of Finland (wind power until 2011)

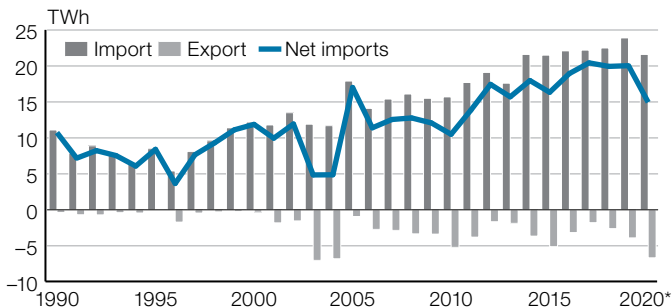
Energy sources in electricity generation, PJ

	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	66.3	250.0	20.6	1.9	16.0	15.4	74.8	72.2	517.2	6
2020*	85.8	243.9	16.3	1.5	18.1	10.7	56.8	53.8	486.8	5

Solar power is included in hydro and wind power.

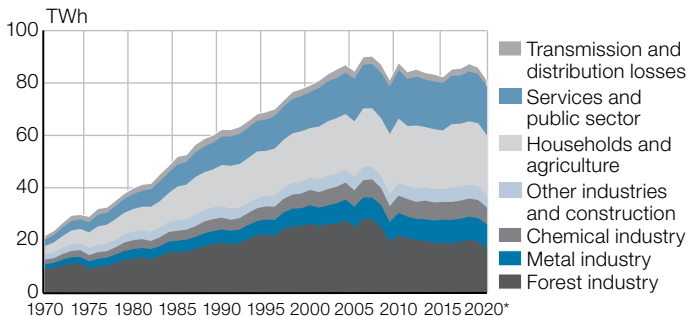
Sources: Statistics Finland, Finnish Energy and Technical Research Centre of Finland VTT (wind power until 2011)

Imports and exports of electricity 1990–2020*

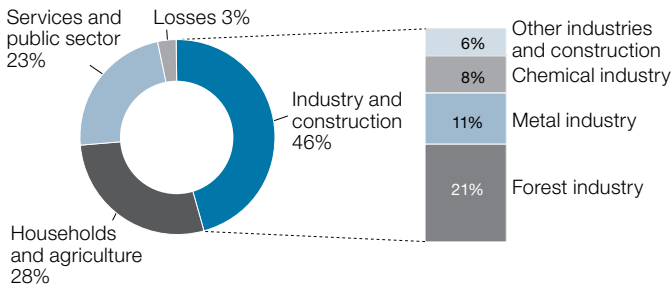


Source: Finnish Energy

Electricity consumption by sector 1970–2020*



Electricity consumption by sector in 2020*



Sources: Finnish Energy and Statistics Finland

All-time record for the highest electricity consumption was 15,105 MWh on 7 January 2016 between 5 pm and 6 pm.

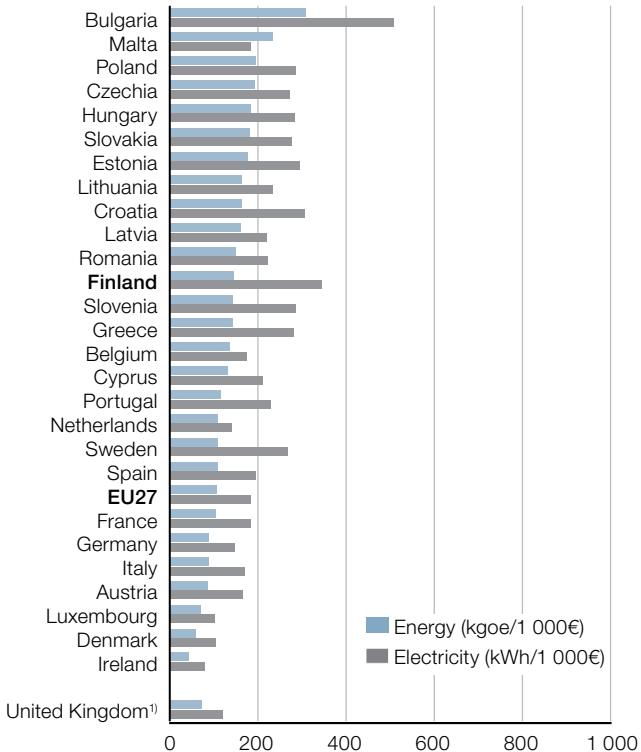
Source: Fingrid

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	4.6	22.1	17.3	3.3	87.3
2009	37.6	19.6	7.3	6.1	4.6	23.0	18.0	2.8	81.3
2010	41.8	21.8	8.6	6.6	4.8	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	5.2	24.0	18.6	2.9	85.2
2013	40.2	19.6	8.4	7.1	5.1	23.0	18.2	2.6	84.1
2014	39.7	19.1	8.4	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	18.9	8.8	6.9	5.6	24.1	18.4	2.6	85.2
2017	40.4	19.4	8.8	6.9	5.4	24.0	18.3	2.8	85.5
2018	41.2	20.2	8.8	6.9	5.3	24.2	19.0	3.0	87.5
2019	40.6	19.3	9.1	6.9	5.3	24.0	18.7	2.7	86.1
2020*	37.3	17.0	8.9	6.5	4.9	22.7	18.6	2.4	81.1
Share									
2020*	46%	21%	11%	8%	6%	28%	23%	3%	100%
Annual Change									
19/20*	-8%	-12%	-2%	-7%	-8%	-5%	0%	-10%	-6%

Sources: Statistics Finland, Finnish Energy.

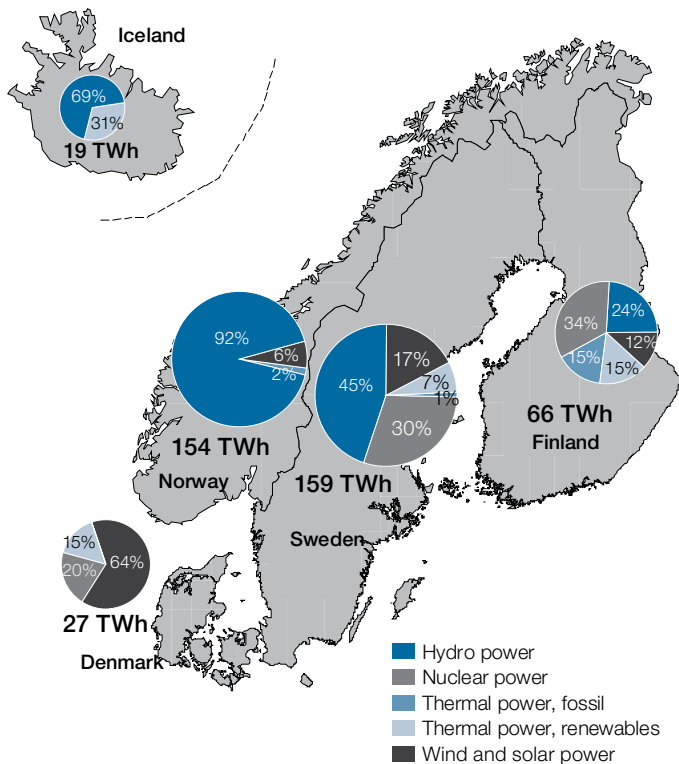
Consumption of energy and electricity per GDP-unit in EU countries 2019



1) The United Kingdom was a member state of the European Union until 31 January 2020.

Source: Eurostat

Electricity generation in the Nordic countries 2020*



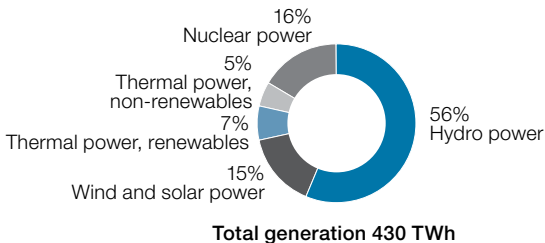
Source: Eurostat

Electricity consumption in the Nordic countries, Estonia and EU27 2020*, TWh

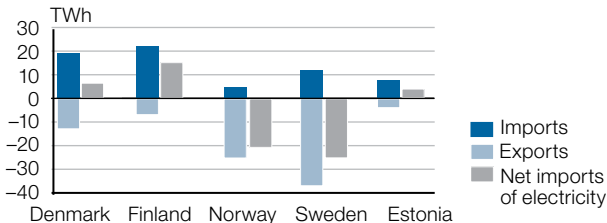
	2019	2020*	Change-%
Sweden	138	134	-3 %
Norway	135	134	-1 %
Finland	86	81	-6 %
Denmark	34	33	-2 %
Iceland	19	19	
Nordic countries total	413	401	-3 %
Estonia	9	9	1 %
EU27 countries	2 728	2 623	-4 %

Source: Eurostat Monthly Statistics 2020.

Total electricity generation in the Nordic countries 2020*



Imports and exports of electricity in the Nordic countries 2020*



Source: Eurostat

Electricity consumption in EU, TWh

	1990	1995	2000	2005	2010	2015	2017	2018	2019
Germany	481	473	501	539	547	528	531	525	511
France	323	368	410	451	472	448	452	449	445
Italy	219	243	279	310	310	297	302	303	302
Spain	129	146	195	248	251	239	247	246	243
Poland	109	104	109	116	129	139	146	151	152
Sweden	131	127	131	133	135	128	130	131	127
Netherlands	75	85	100	108	112	109	112	113	113
Belgium	59	70	79	84	87	83	84	84	83
Finland	59	66	76	82	85	80	82	84	83
Austria	44	48	53	60	62	64	66	66	66
Czechia	53	52	52	58	58	59	61	61	61
Greece	30	36	45	53	55	52	56	52	52
Romania	60	46	41	47	46	47	49	50	50
Portugal	24	29	39	47	51	47	48	49	49
Hungary	33	29	31	36	36	38	40	41	41
Denmark	29	32	33	34	33	32	32	32	32
Bulgaria	36	31	25	27	28	30	31	31	31
Ireland	12	15	20	24	26	26	27	28	28
Slovakia	25	23	23	24	25	25	27	27	26
Croatia	14	10	12	15	16	16	16	17	17
Slovenia	9	9	11	13	12	13	14	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	7	7
Luxembourg	4	5	6	6	7	6	6	6	6
Cyprus	2	2	3	4	5	4	5	5	5
Malta	1	1	2	2	2	2	2	2	2
EU27	1 990	2 066	2 293	2 541	2 612	2 535	2 591	2 594	2 566
United Kingdom ¹⁾	284	304	340	357	338	316	307	307	303

1) The United Kingdom was a member state of the European Union until 31 January 2020.

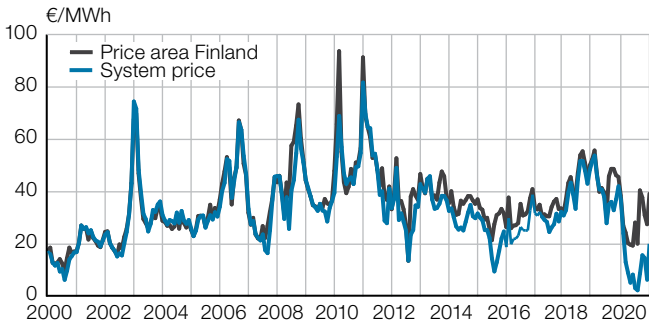
Source: Eurostat

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
2020	9.29	21.19	28.02	28.41	33.69	10.93

Source: Nord Pool, <https://nordpoolgroup.com>

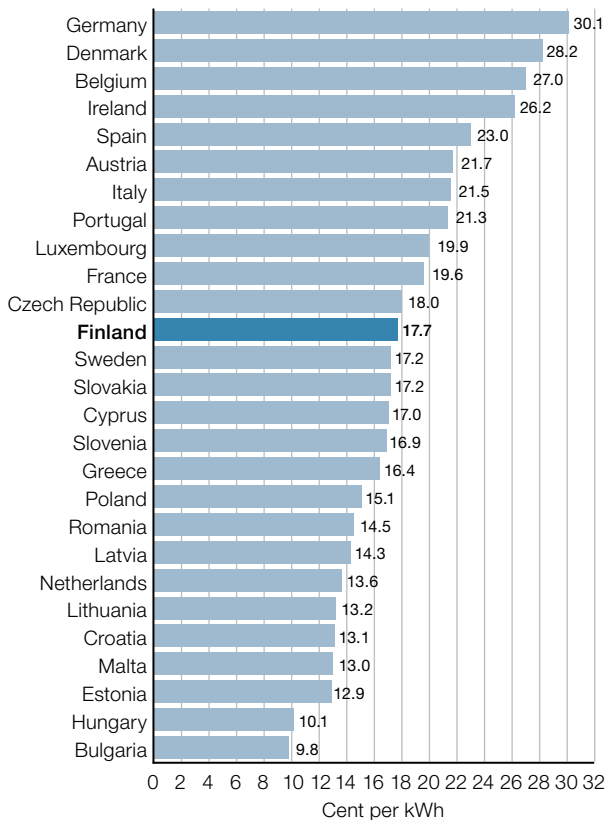
Development of spot prices prices on Nord Pool 2000–2020



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, <https://nordpoolgroup.com>

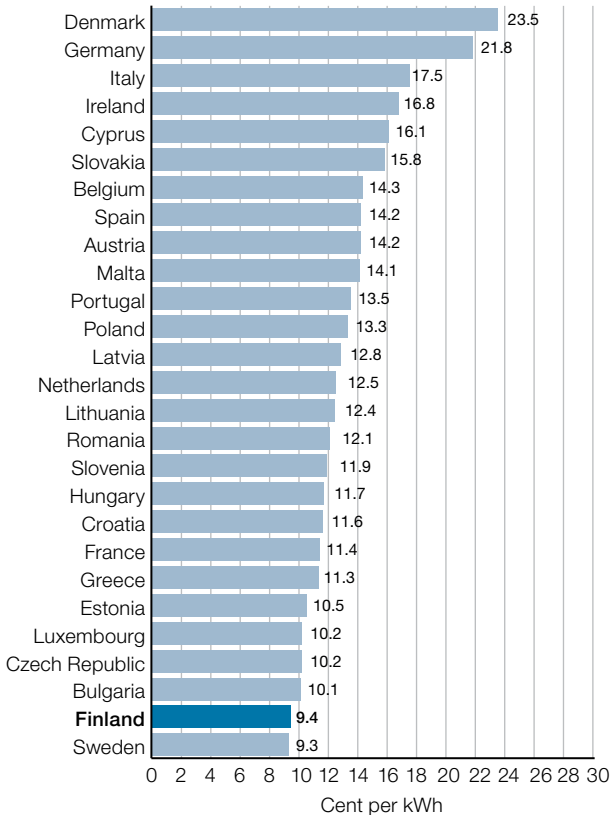
Electricity prices for households on the 2nd half of 2020



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

Source: Eurostat

Electricity prices for industry on the 2nd half of 2020



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

Source: Eurostat

Electricity network information

	1990	2000	2015	2018	2019
Transformer substations, number					
High voltage substations	715	591	944	980	990
Distribution substations	114 019	124 851	136 417	143 014	143 503
Lengths of low voltage lines (0.4 kV–1 kV), km					
Overhead lines	162 076	158 576	139 243	126 829	122 157
Cables (inc. sea cable)	45 705	63 327	102 746	122 354	129 175
Cabling rate	22 %	29 %	42 %	49 %	51 %
Lengths of medium voltage lines (over 1 kV–70 kV), km					
Overhead lines	122 329	121 754	115 967	103 644	98 270
Cables (inc. sea cable)	10 586	12 116	27 144	48 139	54 655
Cabling rate	8 %	9 %	19 %	32 %	36 %
Lengths of high voltage lines (110 kV–400 kV), km					
110 kV	14 000	15 050	16 231	16 343	16 482
220 kV	2 471	2 510	2 092	1 576	1 290
400 kV	3 164	3 926	5 191	5 463	5 463

Source: Energy Authority

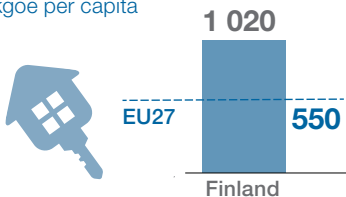
Of power cuts, 73 per cent were due to failures caused by storms, snow and ice in 2019.

Source: Finnish Energy

Heating and cooling

Final energy consumption in households 2019

kgoe per capita



Source: Eurostat

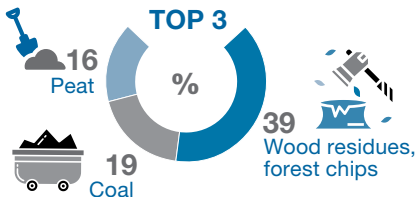
Energy consumption in households, % 2019



Space and water heating

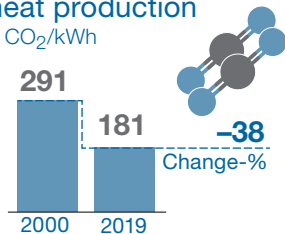
Finland **82** EU27 **78**

Fuel consumption in production of district heat 2019

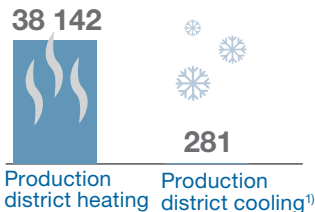


Specific carbon dioxide emissions of district heat production

g CO₂/kWh



District heating and cooling, GWh 2019



1) Source: Finnish Energy

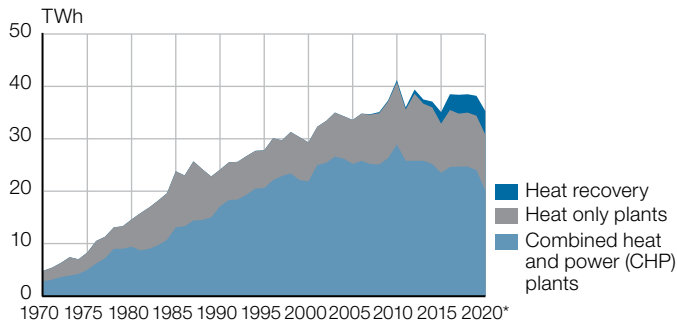
Production and consumption of district heat, TWh

	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	24.0	38.1	4.0	18.5	3.3	12.3	34.2
2020*	15.2	20.1	35.3	3.6	17.4	2.9	11.4	31.7

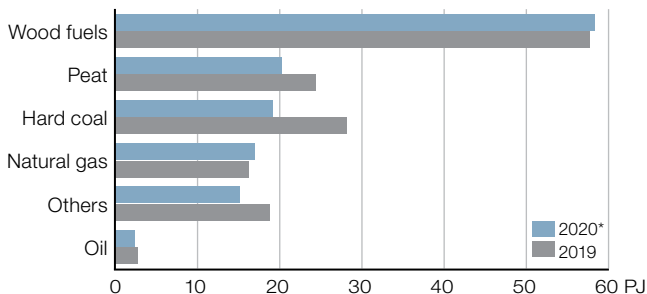
1) Heat only plants include fuel-powered heating plants and heat recovery for example from heat pumps, flue gas scrubbers and condensers. 13% of total heat production originates from heat recovery including heat pumps (2020).

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

Production of district heat 1970–2020*

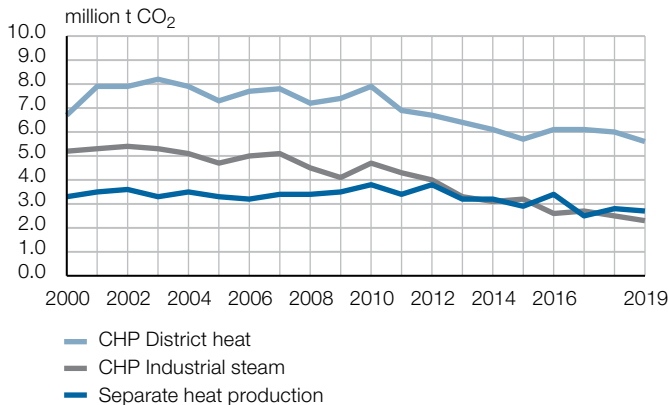


Fuel consumption in production of district heat 2019–2020*

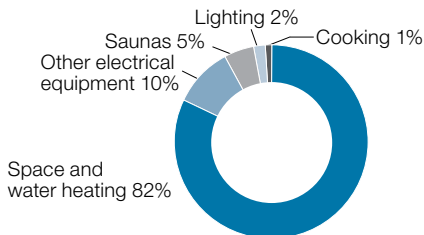


Sources: Statistics Finland, Finnish Energy

CO₂ emissions of heat production 2000–2019



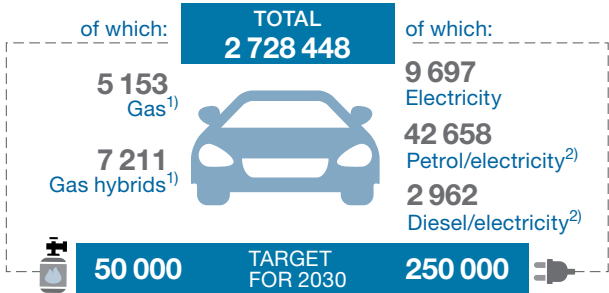
Energy consumption in households 2019



Energy consumption in households in 2019 was 234 PJ.

Transport

Passenger cars in traffic, the end of 2020



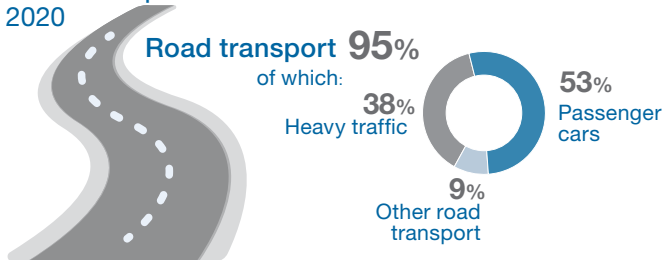
Source: Traficom

Traffic performance, times around the world



1 211 304

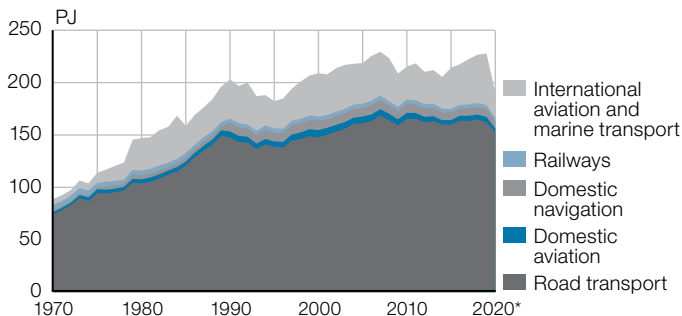
Total transport emissions 2020



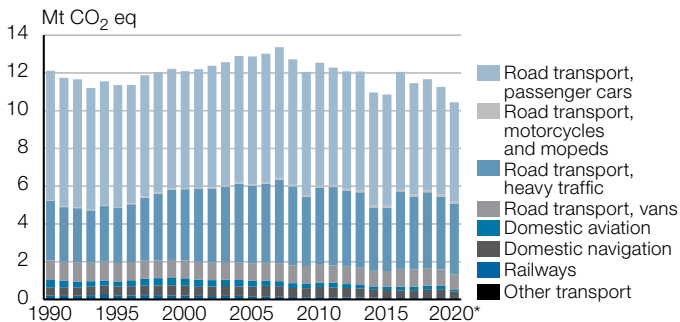
1) Does not include cars using liquefied petrol gas (LPG)

2) Plug-in hybrid

Energy consumption in transport 1970–2020*



Emissions from transport 1990–2020*

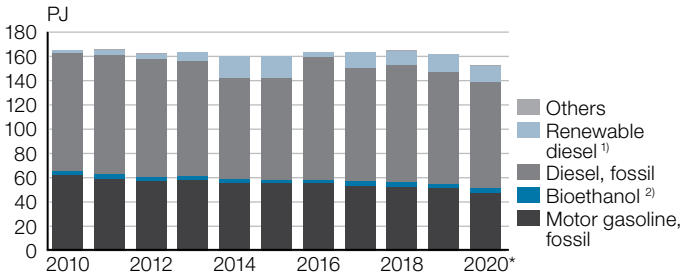


Includes emissions from fuels used in transport.

* According to Statistics Finland's instant preliminary data.

Source: Emissions data by vehicle type: VTT Lipasto

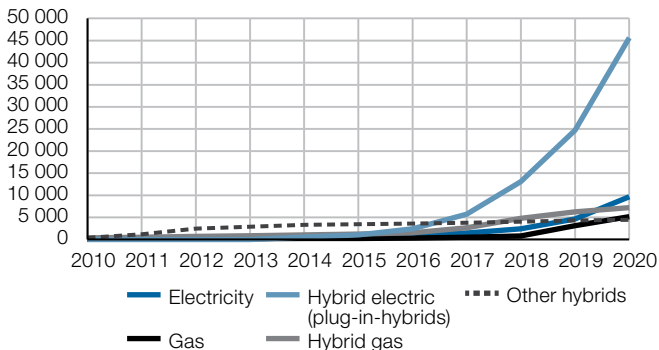
Fuel consumption in road transport 2010–2020*



1) Primarily 2nd generation biodiesel also known as renewable diesel. The value also contains small amounts of 1st generation FAME based biodiesel. Renewable diesel refers to Hydrotreated Vegetable Oils (HVO), which are produced via hydroprocessing of oils and fats. The fuel can be blended with fossil diesel or used in its pure form. Fatty acid methyl esters (FAME) are produced via esterification process. The maximum content of FAME in fossil diesel is generally limited to 7%.

2) Contains also other components i.e. bio ethers, bio esters and biogasoline.

Number of electric, hybrid and gas powered passenger cars in traffic 2010–2020



Total amount of passenger cars in traffic was 2 748 448 by the end of 2020.

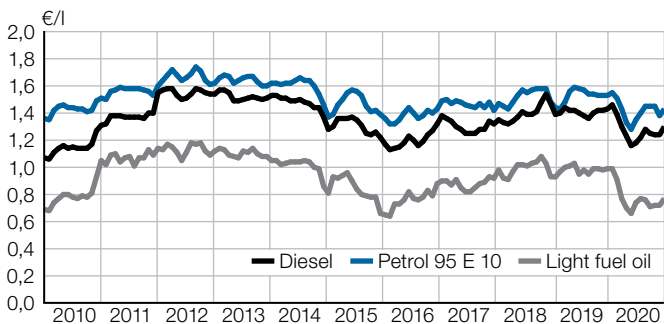
Source: Traficom

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
2020	0.76	1.27	1.41	1.50

Source: Statistics Finland, Consumer Price Index

Development of liquid fuel prices in Finland 2010–2020



Source: Statistics Finland, Consumer Price Index

Industry and enterprises

Energy sector employees 2019



21 968

Turnover of the energy sector 2019



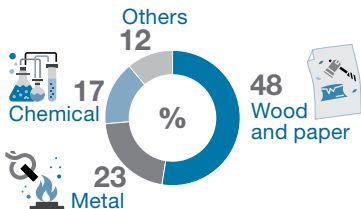
33 732
mil.€

Industry of total energy consumption 2020*

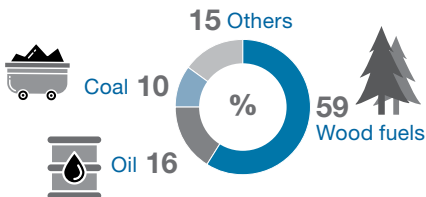
36%



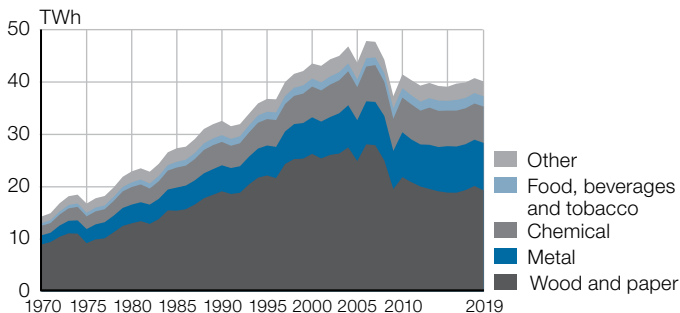
Industry electricity consumption 2019



Industry fuel consumption 2019

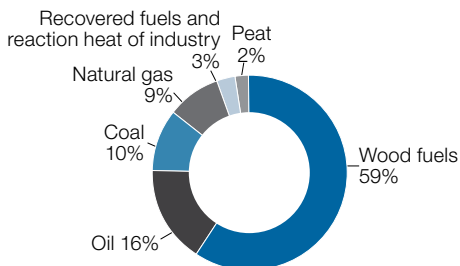


Electricity consumption by branch of industry 1970–2019



Source: Statistics Finland, Financial statements of enterprises

Fuel consumption in industry 2019



Total fuel consumption in industry in 2019 was 377 PJ.

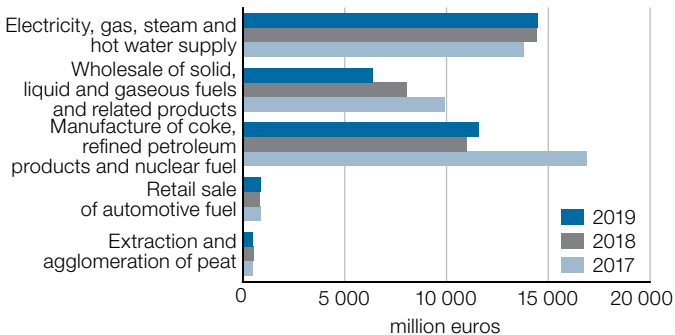
In manufacturing: Energy use was highest in South Karelia and total electricity use was highest in Lapland in 2019.

Enterprises in energy sector in 2019

	Turnover, EUR mil.	Staff expenses, EUR mil.	Number of enter- prises	Employees
Electricity, gas, steam and hot water supply	14 477	880	930	12 479
Manufacture of coke, refined petroleum products and nuclear fuel	11 565	321	14	3 890
Wholesale of solid, liquid and gaseous fuels and related products	6 383	71	119	825
Retail sale of automotive fuel	853	112	619	3 370
Extraction and agglomeration of peat	455	65	445	1 404
Total	33 732	1 450	2 127	21 968

Source: Statistics Finland, Financial statements of enterprises

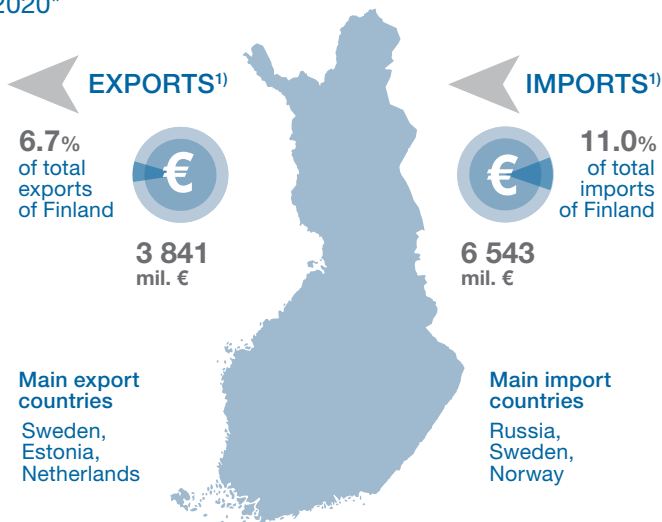
Turnover of enterprises in energy sector 2016–2019



Source: Statistics Finland, Financial statements of enterprises

Imports and exports

Total energy products 2020*



1) Source: Finnish Customs / Foreign Trade Statistics

Energy dependence²⁾ 2019



FINLAND 42% while

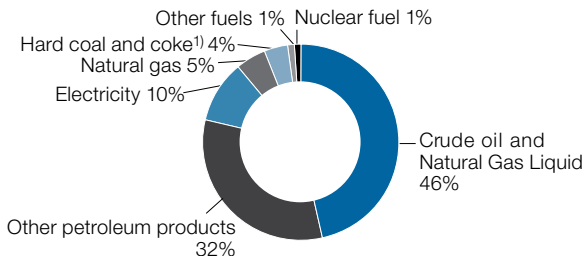


EU27 61%

2) Nuclear energy is counted
as domestic energy.

Source:
EU Commission, DG Energy

Value of energy imports in 2020*



1) includes coking coal

Total imports of energy products were 6 543 million euros in 2020*
That was 10.97% of total imports to Finland.

Energy imports in 2020*

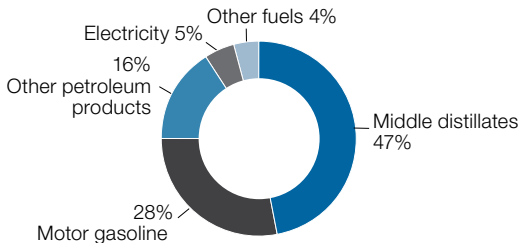
	Unit	Russia	Sweden	Norway	Other countries	Total Amount	Total Value mil. €
Coal and coal products	1000 t	1 333	0	0	1 333	2 665	258
Natural gas	mil. m ³	1 500	–	–	750	2 249	349
Oil and petroleum products ¹⁾	1000 t	11 509	1 746	1 828	2 091	17 174	5 148
Peat	1000 t	29	4	–	4	38	1
Wood fuels ²⁾	1000 t	241	123	–	148	512	30
Nuclear fuel	tU	21	.	–	35	56	84
Electricity	TWh	3	19	0	0	22	625
Value	€ mil.	3 461	1 293	590	1 198		6 543

1) Includes natural gas condensate

2) Includes wood pellets and other wood fuels

Source: Finnish Customs/ Foreign Trade Statistics

Value of energy exports in 2020*



Total exports of energy products were 3 841 million euros in 2020*
That was 6.7% of total exports to Finland.

Energy exports in 2020*

	Unit	Sweden	Estonia	Nether-lands	Other coun-tries	Total Amount	Total Value mil. €
Coke ¹⁾	1000 t	4	.	81	15	100	20
Petroleum products	1000 t	2 051	437	947	3 668	7 103	3 596
Peat	1000 t	6	2	34	53	95	13
Wood fuels ²⁾	1000 t	61	0	0	16	77	6
Electricity	TWh	0	–	–	7	7	207
Value	€ mil.	1 186	366	364	1 926		3 841

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 (Gasoil, sulphur-free and Gasoil, low sulphur)	t	43.2	12	0.83
Diesel oil	t	42.8	11.9	0.81
Kerosene (Jet fuel)	t	43.3	12	0.79
Other kerosenes	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	50.0	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	9.5	2.6	
Forest residue chips	t	10.0	2.8	
Bark	t	7.5	2.1	
Saw dust	t	7.0	1.9	
Wood pellets	t	17.0	4.7	
Biogas ¹	1 000 m ³	17.0–28.0		

1 Excl. biomethane and synthetic biogas.

Source: Fuel classification 2020, Statistics Finland

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	66.8	Default bio share 9%
Diesel fuel	63.9	Default bio share 13%
Light fuel oil	73.1	
Heavy fuel oil	77.0–79.2	
Kerosenes	73.2	
LPG	64.9	
Other oils	71.3–74.1	
Hard coal	93.1	
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 2020
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%.

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/energia2020/.

Energy in Finland

Statistical pocketbook on energy statistics.
www.tilastokeskus.fi/energia



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ISSN 2242–9085 (pdf)

ISBN 978–952–244–679–4 (pdf)

ISSN 1457–0491 (print)

ISBN 978–952–244–678–7 (print)

Product number 3055 (print)

