

# Greenhouse gases

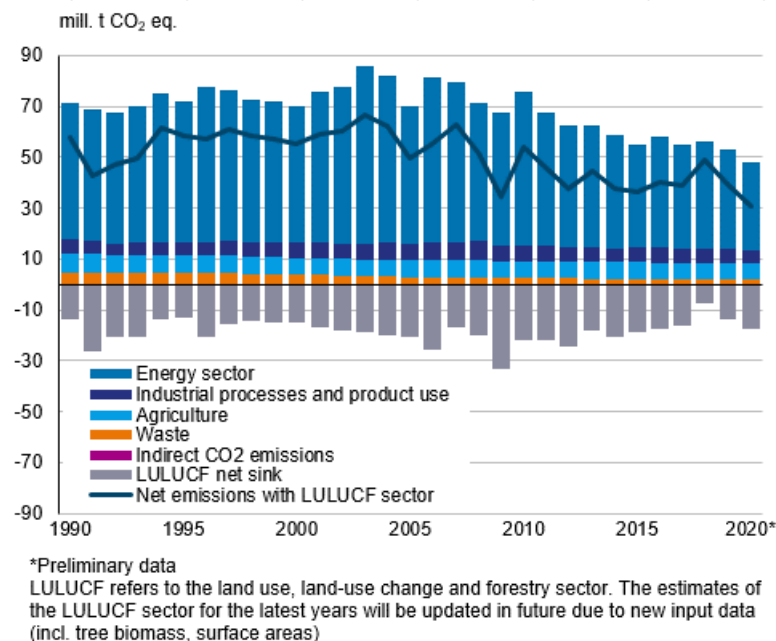
2020, preliminary data

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## Greenhouse gas emissions fell in 2020, international commitments attainable for 2013 to 2020

According to Statistics Finland's preliminary data, the total emissions of greenhouse gases in 2020 corresponded with 48.1 million tonnes of carbon dioxide (CO<sub>2</sub> eq.). Emissions fell by nine per cent from the previous year. The fall in emissions was affected by the warm winter, recent changes in the production structure of electricity and the decrease in transport performance. Especially the decrease of fellings from the previous year increased the net sink of the LULUCF sector, i.e. land use, land-use change and forestry, which was -17.2 million tonnes of CO<sub>2</sub> equivalent. Emissions and removals in the LULUCF sector are not included in the total emissions described above. On the basis of the data so far, Finland is meeting its emission reduction commitments under the EU and the Kyoto Protocol concerning the entire period 2013 to 2020. The data to be published are based on the preliminary report to be submitted by Statistics Finland to the European Commission by 15 January 2022 concerning emissions in 2020.

**Finland's greenhouse gas emissions and removals by sector and the sum of all sectors, where the net sink of the LULUCF sector is deducted from the combined emissions of other sectors**



According to preliminary data, total emissions in 2020 amounted to 48.1 million tonnes of CO<sub>2</sub> equivalent and they fell by nearly nine per cent (4.7 million tonnes of CO<sub>2</sub> equivalent) from the year before and by 32 per cent (23.1 million tonnes of CO<sub>2</sub> equivalent) from 1990. The sum of emissions and removals in the LULUCF sector, or the net sink is not included in these total emissions. Taking the net sink of the LULUCF sector into account in total emissions would translate into 30.9 million tonnes of CO<sub>2</sub> equivalent in 2020.

The energy sector is Finland's largest source of emissions, significantly affecting the annual variation of total emissions as well. According to the preliminary calculation, the energy sector's emissions totalled 34.6 million tonnes of CO<sub>2</sub> equivalent, which is 11 per cent lower than in the previous year and 50 per cent less than in the peak year of 2003. The fall in emissions from the previous year was affected by the warm winter, recent changes in the production structure of electricity and the decrease in transport performance (link to the [energy release](#)).

Emissions from industrial processes and product use (incl. F-gases) amounted to 5.1 million tonnes of CO<sub>2</sub> equivalent in 2020 and they decreased by five per cent from the year before. Emissions from the waste sector went down by three per cent from 2019 to 2020, being 1.7 million tonnes of CO<sub>2</sub> equivalent. Emissions from agriculture amounted to 6.5 million tonnes of CO<sub>2</sub> equivalent and remained on level with the previous year: Preliminary data for 2020 were 0.03 million tonnes of CO<sub>2</sub> equivalent, which is under half a per cent less than in the previous year.

The net sink of the land use, land-use change and forestry sector (LULUCF), that is, the sum of emissions and removals was -17.2 million tonnes of CO<sub>2</sub> eq. in 2020, which is 27 per cent higher than in the year before. The change was particularly due to the five per cent drop in fellings from the year before. Calculation of the net sink becomes revised yearly for the penultimate years. This is due to utilisation of updated data, e.g. national forest inventory data, in the calculation. These data affect, e.g. the areas and growing stock which, in turn, affect the litter input to the soil and thus the soil carbon stock. The now released preliminary data on the net sink of the LULUCF sector for 2020 are 5.7 million tonnes of CO<sub>2</sub> equivalent lower than in the instant preliminary data based on more incomplete data published in May (see the [review](#) of this release).

## Greenhouse gas emissions in Finland by sector

		Emissions, million tonnes CO <sub>2</sub> eq.							
		1990	2000	2005	2010	2015	2018	2019	2020 <sup>4)</sup>
Emissions without LULUCF sector <sup>1)</sup>		71.2	70.2	69.9	75.7	55.0	56.2	52.8	48.1
Energy sector		53.4	53.7	53.7	60.2	40.6	42.1	39.0	34.6
	Energy industries	19.0	22.1	22.2	31.0	17.8	18.7	16.2	13.1
	Manufacturing industries and construction	13.4	11.9	11.4	10.0	6.8	6.8	6.6	6.2
	Transport	12.1	12.1	12.9	12.7	10.9	11.7	11.2	10.4
	Other energy <sup>2)</sup>	9.0	7.5	7.3	6.6	5.2	4.9	4.9	4.8
Industrial processes and products use		5.4	6.0	6.8	6.2	5.7	5.7	5.4	5.1
	Industrial processes (excl. F-gases) <sup>3)</sup>	5.3	5.2	5.6	4.8	4.4	4.6	4.4	4.1
	Consumption of F-gases <sup>3)</sup>	0.1	0.7	1.2	1.4	1.3	1.1	1.0	1.0
Agriculture		7.5	6.6	6.5	6.7	6.6	6.5	6.6	6.5
Waste management		4.7	3.8	2.8	2.6	2.1	1.8	1.8	1.7
Indirect CO <sub>2</sub> emissions		0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LULUCF sector <sup>1)</sup>		-13.4	-15.0	-20.5	-21.7	-18.8	-7.4	-13.5	-17.2

1) LULUCF refers to the land use, land-use change and forestry sector. Negative figures indicate that the growth of carbon pools exceeded the greenhouse gas emissions meaning that the sector was a carbon sink. The sector does not come under the scope of the EU Emissions Trading System or the reduction targets of the EU's Effort Sharing Decision. The figures for the latest years will become revised as the source data are updated (e.g. growing stock and surface areas).

2) Other energy includes sub-categories of heating of buildings, fuel use in agriculture, forestry and fisheries (incl. machinery), other fuel use and fugitive emissions from fuels.

3) F-gases refer to fluorinated greenhouse gases (HFC, PFC compounds, SF<sub>6</sub> and NF<sub>3</sub>).

4) Preliminary data

Emissions not included in the EU Emissions Trading System amounted to around 28.4 million tonnes of CO<sub>2</sub> equivalent in 2020, and they fell by three per cent from the previous year. Emissions not included in the EU ETS are calculated as the difference between the total emissions and verified emissions of the sectors in the EU ETS, from which CO<sub>2</sub> emissions from domestic civil aviation as calculated in the inventory, are deducted. The data on the verified emissions of the emissions trading sector are published by the [Energy Authority](#) (In Finnish).

Finland has obligations under both the EU's Effort Sharing Decision and the Kyoto Protocol for the period 2013 to 2020. The EU Effort Sharing Decision defines annual national emission allocations for emissions not included in the EU Emissions Trading System. Based on the data so far, Finland is meeting its targets set for the entire commitment period. This will be confirmed once international reviews are completed in autumn 2022.

During the Kyoto Protocol's second commitment period, Finland's emissions not included in the EU Emissions Trading System must be limited to 240.5 million tonnes of CO<sub>2</sub> eq. Certain LULUCF activities also affect the commitment under the Kyoto Protocol (afforestation and reforestation, deforestation, forest management). Different LULUCF activities are taken into account in the commitment using different accounting rules. Based on the data now released, Finland will also meet its commitment under the Kyoto Protocol, but will have to use for this emission units transferred from the previous Kyoto Protocol commitment period or acquired from the Clean Development Mechanism or Joint Implementation due to the additional burden arising from LULUCF activities.

More information on the implementation of the commitments under the EU and the Kyoto Protocol is available [in the review of the release \(in Finnish\)](#).

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## Revisions in these statistics

The emission and removal figures for the greenhouse gas inventory become revised every year in the entire time series, because constant improvements are made to the inventory, taking into account the international review recommendations of inventories and the development of the scientific basis for emission calculation methods. In addition, the preliminary data are based on more detailed activity data than the instant preliminary data, which is compiled when not all the necessary data are yet available. The changes in calculations are described in the annual National Inventory Report submitted to the UN and the EU.

The now released preliminary total emissions without the LULUCF sector for 2020 are 0.2 million tonnes of CO<sub>2</sub> equivalent (0.4%) lower than in the instant preliminary data released in May. Emissions from both the energy sector and industrial processes and product use are 0.08 million tonnes of CO<sub>2</sub> equivalent lower than in the instant preliminary data, which is mainly due to the revisions in the emission coefficients for the recovery of F-gases and in the allocation of emissions from energy and process-based steel production. Emissions from agriculture are 0.06 million tonnes of CO<sub>2</sub> equivalent lower than in the instant preliminary data. The emission data of the waste sector are on level with those given in the instant preliminary data.

For the LULUCF sector, calculation of the net sink becomes revised yearly for the penultimate years. This is due to utilisation of updated data, e.g. national forest inventory data, in the calculation. These data affect, e.g. the areas and growing stock which, in turn, affect the litter input to the soil and thus the soil carbon stock. According to the preliminary data of the latest release, the net sink of the LULUCF sector for 2020 is 5.7 million tonnes of CO<sub>2</sub> equivalent lower than in the instant preliminary data based on more incomplete data published in May (see [review](#) of this release).

### Revision of Finland's greenhouse gas emissions. Emissions expressed in million tonnes CO<sub>2</sub> equivalent

	Statistical reference year	Previous release, 21 May 2021	Latest release, 16 December 2021	Change <sup>1)</sup>
		Mill. t CO <sub>2</sub> eq.		%
Total emissions (without LULUCF sector) <sup>2)</sup>	1990	71.2	71.2	-0.1
	2005	69.9	69.9	0.0
	2010	75.7	75.7	0.0
	2015	55.1	55.0	-0.2
	2016	58.1	57.9	-0.2
	2017	55.3	55.1	-0.3
	2018	56.3	56.2	-0.3
	2019	53.1	52.8	-0.5
	2020	48.3 <sup>5)</sup>	48.1 <sup>4)</sup>	-0.4
LULUCF sector <sup>2)</sup>	1990	-13.5	-13.4	-0.8
	2005	-20.5	-20.5	-0.2
	2010	-20.8	-21.7	4.3
	2015	-17.9	-18.8	4.6
	2016	-16.9	-17.7	4.2
	2017	-15.7	-16.3	3.9
	2018	-8.2	-7.4	-10.4
	2019	-14.7	-13.5	-7.9
	2020	-23.0 <sup>5)</sup>	-17.2 <sup>4)</sup>	-24.9

	Statistical reference year	Previous release, 21 May 2021	Latest release, 16 December 2021	Change <sup>1)</sup>
		Mill. t CO2 eq.		%
Emissions not included in the Emissions Trading System <sup>3)</sup>	2013	31.2	31.2	0.1
	2014	29.8	29.8	0.0
	2015	29.5	29.5	0.0
	2016	30.7	30.6	-0.2
	2017	30.0	39.9	-0.2
	2018	29.9	29.8	-0.2
	2019	29.6	29.4	-0.9
	2020	28.6 <sup>5)</sup>	28.4 <sup>4)</sup>	-0.7

1) Change between the latest and previous releases

2) LULUCF refers to the land use, land-use change and forestry sector

3) Excluding CO2 emissions from domestic civil aviation

4) Preliminary data

5) Proxy estimate

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Source: Greenhouse gas inventory unit. Statistics Finland