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# Approximated EU greenhouse gas inventory

## Proxy GHG emission estimates for 2020

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European Environment Agency
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# Executive summary

## About this report

This report provides GHG emissions estimates for the EU including international aviation. This Executive Summary includes an analysis of the important changes in GHG emissions across the EU, by sector and by Member State.

## Main findings

For EU27 the emissions have decreased by 293.3 million tonnes of $CO_2$ equivalents, or 8.1 % (total GHG emissions without LULUCF, including indirect $CO_2$, without international aviation) between 2019 and 2020. International aviation equalled for EU27 to 60.7 million tonnes of $CO_2$ equivalents in 2020, which is about 54.3 % lower than in 2019. Emissions including international aviation across the EU27 decreased by 9.8 % compared to 2019. This is a reduction of 31.4 % when compared to 1990. Table ES.1 provides details on the total levels of emissions including international aviation.

It is important to note that emissions reductions within the EU have two main reasons. The first one is the reduction in economic activity due to theCOVID-19 pandemic, the second one is continuing trend of emissions decreases which started in previous years. ETS emissions (mostly covering emissions from electricity and heat production) have decreased more than the ESD emissions.

The changes in 2020 are caused by number of reasons, whereby is important to mention increase in use of renewable sources for electricity generation and change of fossil fuels to natural gas due to the high carbon and fuel coal prices. Changes in the fuels consumed in 2020 doesn't follow the weather conditions as much as in previous years.

The emission estimates for 2020 are affected by the COVID-19 pandemic as well as by several other factors that are explained below.

**Table ES.1 Emissions including international aviation (kt $CO_2$ eq.)**

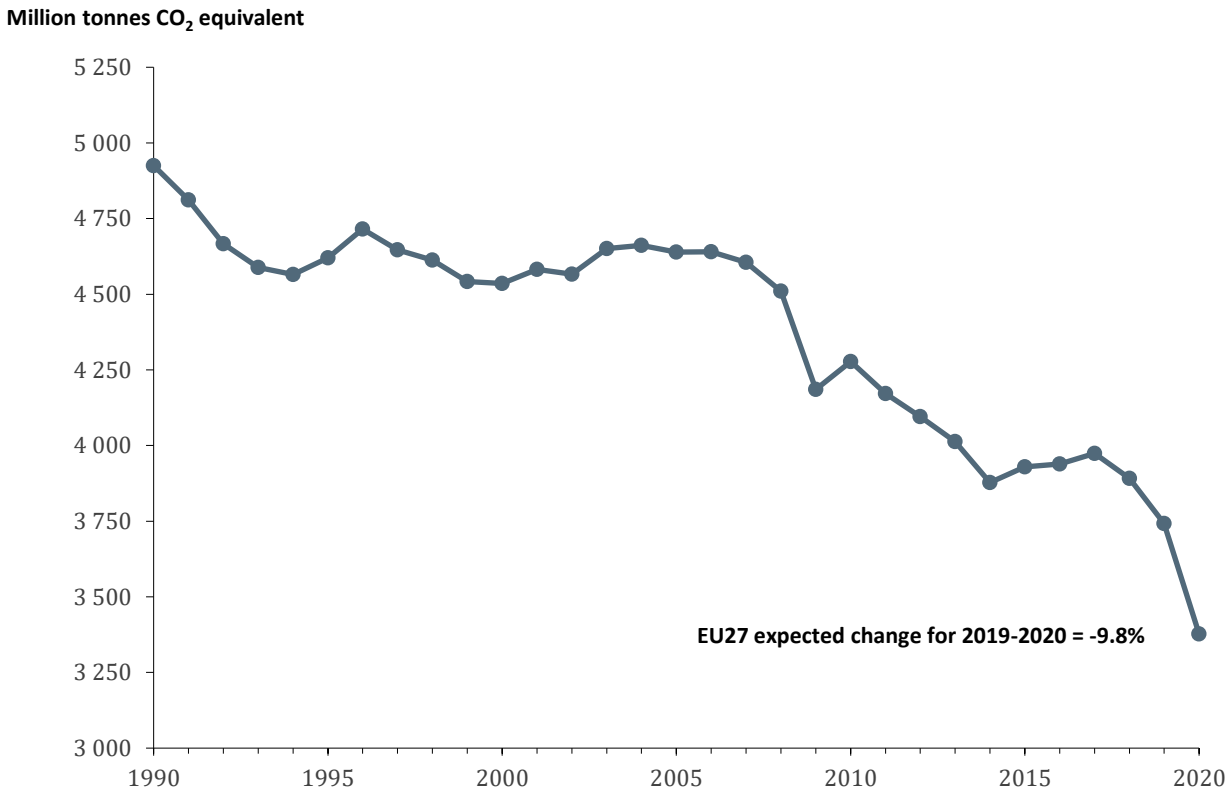
| European Union (EU27) | 1990 | 2019 | 2020 | 2020-2019 | 2020/2019 | 2020-1990 | 2020/1990 |
|---|---|---|---|---|---|---|---|
| Total excl. LULUCF incl. indirect $CO_2$ | 4 870 956 | 3 610 052 | 3 316 739 | -293 313 | -8.12% | -1 554 217 | -31.91% |
| International aviation | 54 153 | 132 589 | 60 652 | -71 938 | -54.26% | 6 498 | 12.00% |
| Total $CO_2$ eq. including international aviation | 4 925 109 | 3 742 641 | 3 377 390 | -365 250 | -9.76% | -1 547 719 | -31.43% |

***Changes in GHG emissions across the EU***

The estimates for 2020 indicate the decreasing trend of emissions reduction. Emissions levelled off between 2014 and 2017 (Figure ES.1), and the estimate for 2020 shows a 9.8 % decrease compared to 2019 emissions level.

For EU27 the 2020 emissions are estimated to be 3377 million tonnes of $CO_2$ equivalents (Mt $CO_2$ eq.), which indicates a decrease from 2019 of 365 million tonnes of $CO_2$ equivalents (Mt $CO_2$ eq.), or 9.8 %.

**Figure ES.1 Trends in total GHG emissions, 1990-2020**




**Note:** Total GHG emissions without LULUCF including indirect $CO_2$ and international aviation
**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

The trend shows 9.8 % decrease in emissions for the EU27 (total with international aviation) since 2019 and the GDP growth is correspondingly showing negative trend of 6.1 % in the same year (Figure ES.2). It can be seen that the COVID-19 pandemic strongly affected Member States economics and GHG emissions as well. All Member States achieved reductions in emissions. All EU countries (except Ireland) had negative GDP growth.

**Figure ES.2 GHG emissions, GDP growth and heating degree days change 2019-2020**


**Note:** Heating Degree Days (HDDs) are an indication of heat demand based on outdoor temperatures. Positive HDD change can correlate with increased heating demand.

**Source:** EEA's ETC/CME, based on GDP from EEA (Gross domestic product at market prices, Chain linked volumes (2015), mrd euro) and Eurostat Heating Degree Days (HDDs), an indication of heat demand based on outdoor temperatures, from Eurostat. HDD change was not available for IS and EU27. Data for UK are available through https://www.gov.uk/government/statistics/energy-trends-section-7-weather

Climatic factors have a significant effect on energy demand and GHG emission trends. The exceptionally warm years were 2015, 2016, 2017, 2018, 2019 and 2020. The year 2020 was the warmest year for Europe (Copernicus, 2021). Furthermore, the warmest winter for 2019/2020 was noted. On the other hand, winter 2020/2021 was close to 1991-2020 average. The pattern in heating degree days (a standardized measure for linking heating demand and weather conditions) confirms slightly lower heating demand in 2020 compared to 2019. The highest amount of cooling degree days in 2020 was observed for Cyprus, Malta and Greece, as it is to be expected for these countries. Figure ES 2 also shows that in the 11 Member States heating degree days increased while total emissions decreased. Therefore, the correlation between amount of heating degree days and total emissions is not very significant for many Member states.

***Changes in EU GHG emissions by sector***

On a sectoral basis, the largest absolute emission decrease in the EU occurred in the energy sector (i.e. all combustion activities and fugitive emissions). Energy related emissions decreased by 271 Mt $CO_2$ eq. (-9.8 %) across the EU. Within the energy sector, emissions decreased in all categories. The most significant decrease is for energy industries (−118 Mt $CO_2$ eq.), which are followed by transport (−106 Mt $CO_2$ eq.). Fugitive emissions from fuels decreased as well (-2 Mt $CO_2$ eq.).

These changes in emissions in 2020 reflect large changes in the fuel mix. Primary fossil energy consumption decreased again in 2020, and the contribution of coal to the energy mix decreased in 2020 while the share of gas and renewable fuels increased. Wind and solar contributed the most to the increase in renewable electricity, solid biofuels decreased slightly while hydro stayed stagnant. Primary energy consumption of nuclear energy decreased as well as its contribution to the energy mix.

The consumption of all fossil fuels; solid, liquid and gaseous; decreased in 2020. The consumption of gaseous fuels decreased by 2.2 % while consumption of liquid fuels decreased significantly by 11.8 % and solid fossil fuels consumption fell significantly as well by 19.1 % (EEA 2021c)[1].

The emissions from the sector Industrial Processes and Product Use decreased by 5.7 % between 2019 and 2020 in the EU27. The largest contribution to this emission decrease was from metal industry, which decreased by 13.1 %.

Agriculture emissions decreased by 0.4 % mainly due to emission decreases from enteric fermentation, and also agricultural soils, other carbon containing fertilisers, manure management and liming.

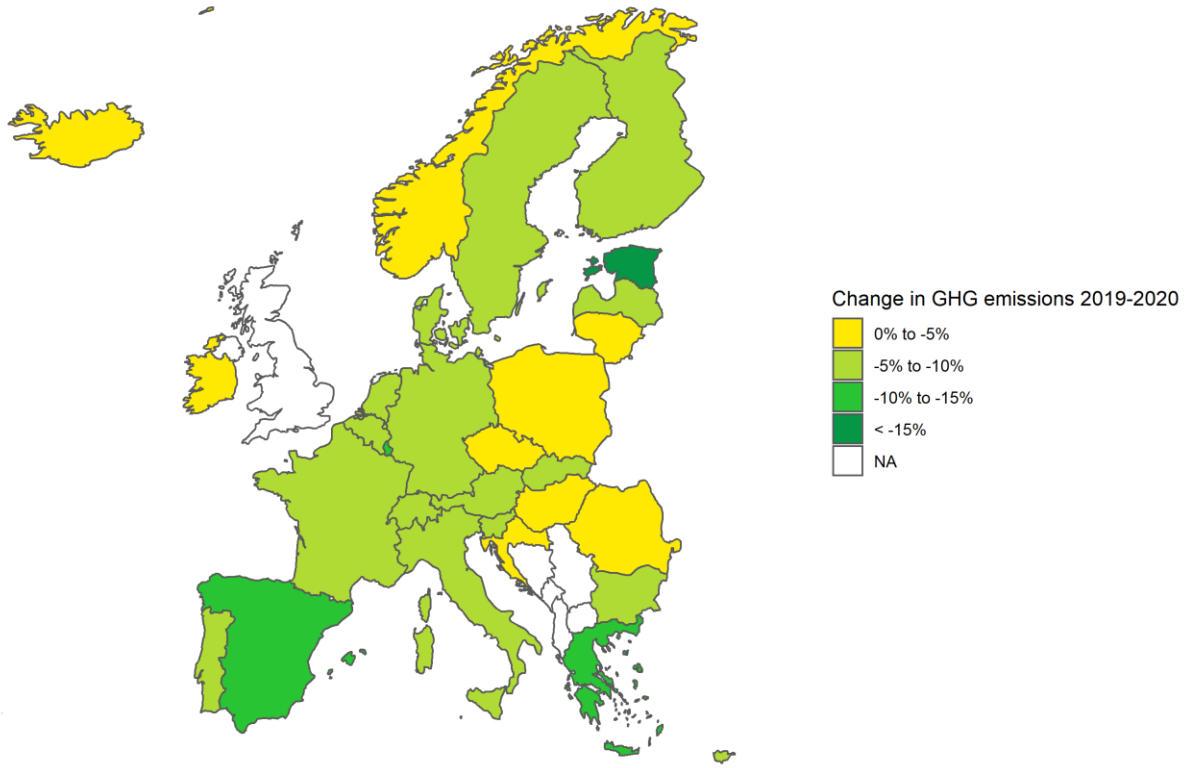
The trend in emissions from waste (−1.2 % compared to previous year) continues the decrease seen in previous years with largest reduction being in emissions from solid waste disposal.

Reporting under the Monitoring Mechanism Regulation requires separate detail for the EU ETS and non-ETS sectors. Between 2019 and 2020 the emissions decreased by 11.6 % across stationary installations covered by the European Emissions Trading System for the EU, whereas emissions covered by the Effort Sharing Decision (ESD) decreased by 5.6 %.

***Changes in member state's GHG emissions***

Greenhouse gas emissions decreased in all EU Member States in 2020. Figure ES.3 depicts the regional distribution of these changes which differ significantly between different regions.

**Figure ES.3 Regional trends in total GHG emissions change 2019-2020**



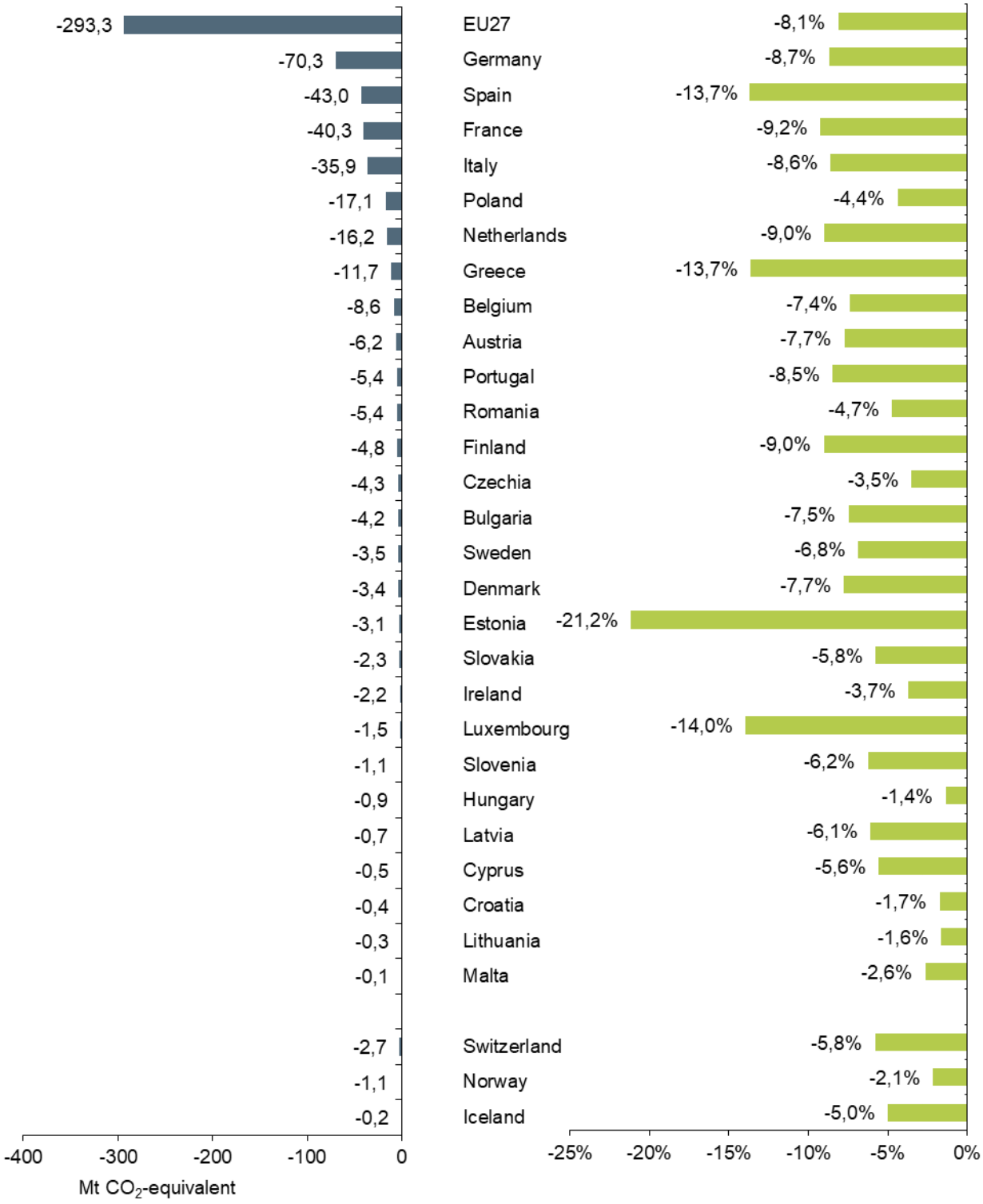

(1) ETC 2021, energy efficiency proxy 2020

Comparing the changes across Member States (Figure ES.4), the largest absolute emission change occurred in Germany, where emissions decreased by 70 Mt $CO_2$ eq. Apparent decrease in emissions occurred also for Spain (-43 Mt $CO_2$ eq.), France (-40 Mt $CO_2$ eq.), Italy (-36 Mt $CO_2$ eq.), Poland (-17 Mt $CO_2$ eq.) and the Netherlands (-16 Mt $CO_2$ eq.).

The largest relative declines were in Estonia (-21.2%) and Luxembourg (−14.0 %).

In the non-EU member countries of the EEA, emissions decreased in Switzerland (-5.8 %, or -3 Mt $CO_2$ eq.), Norway (-2.1 % or -1 Mt $CO_2$ eq.) and Iceland (-5.0 % or -0.2 Mt $CO_2$ eq.).

**Figure ES.4 Member States' emissions, change 2019-2020**



# 1 Background and objective

This approximated GHG inventory is an early estimate of the GHG emissions for the preceding year. The legal basis for the approximated GHG emission estimates is Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action. Article 26(2) requires Member States to submit to the Commission approximated greenhouse gas inventories for the year *t*-1 by 31 July every year. Iceland is not an EU Member State but has to report its approximated inventory, where possible, as any other EU Member State. The European Environment Agency (EEA) assists the Commission in the compilation of the Union approximated greenhouse gas inventory. These estimates are referred to as approximated ('proxy') estimates or inventories as they cover the year for which no official GHG inventories have been prepared. Should a Member State not provide their own proxy emission estimate, the EEA produces and uses gap-filled estimates in order to have a complete approximated GHG inventory for the European Union. Non-EU member countries of the EEA are invited to submit their proxy estimates on a voluntary basis.

The scope of the proxy estimates covers total GHG emissions, for all gases, sectors, and Member States, as reported under the Kyoto Protocol and the UNFCCC excluding the land use, land-use change and forestry (LULUCF) sector but including indirect $CO_2$.

Member States are responsible for the methodological choice regarding their own estimates. For gap-filling where a Member State has not provided their own estimate the EEA has used the latest Eurostat and EU ETS data to carry forward reported emissions from the energy and industrial processes sectors. These two source categories typically account for the bulk of emissions and have the largest annual change. The agriculture and waste sectors are set to repeat the previous year's values. The estimates assume no change in emission factors or methodologies as compared to the latest official inventory submissions to the UNFCCC for the year *t*-2. International aviation was gap-filled, in case reporting countries have not reported the data. The gap-filling procedure used flight and emission data provided by Eurocontrol.

The EU is aiming to have a leading role in the emission reduction and for this purpose a number of measures have been adopted. One of the most important measures is the Effort Sharing Decision, which covers sectors of the economy which fall outside the scope of the EU Emission Trading Scheme. These sectors, which include transport, buildings, agriculture, non-ETS industry and waste, account up to 60 % of the total EU emissions (EU 2018).

The official submission of 2020 inventories to the United Nations Framework Convention on Climate Change (UNFCCC) will take place in 2022.

Table 1.1 provides an overview of different emission estimates by EU bodies. More information can be found on the EEA website 'Note on different emission estimates by EU institutions': www.eea.europa.eu/publications/different-emission-estimates-by-eu-bodies-2

**Table 1.1 Overview of EU data sources for GHG estimates**

| What | Who | When | Time | Geographical scope | Sectoral Scope | Obligation |
|---|---|---|---|---|---|---|
| **GHG inventory to UNFCCC** | EEA and DG CLIMA | 15 April (draft) and 30 May (final) | *t*-2 | EU and its 27 Member States + UK, Iceland | All gases and sectors (100% of emissions) | EU MMR (525/2013) |
| **Approximated / Proxy GHG inventory** | EEA, DG Climate Action | 31 October | *t*-1 | EU and its 27 Member States, Iceland and other EEA member countries when available | All gases and sectors (100% of emissions) | EU Regulation (2018/1999) |
| **EU ETS** | DG Climate Action, EEA | Early April, May and summer (between July and September) | *t*-1 | EU27, UK, Iceland and other EEA member countries | About 9,500 installations (~39% of total emissions) | EU ETS Directive (2003/87/EC) |
| **$CO_2$ early estimates from fossil fuel combustion** | Eurostat | April / May | *t*-1 | EU and its 27 Member States + UK | $CO_2$ from fossil fuel combustion (~80% of total emissions) | Eurostat's work programme |
| **Air emissions accounts, air emission intensities and air emission footprints** | Eurostat | annual | t-2 | EU27 + UK | Six greenhouse gases including $CO_2$ and seven air pollutants | Regulation (EU) 691/2011 (Annex I) |
| **EDGAR global database** | DG JRC | August / September | *t*-1 | Global coverage | All gases and sectors (100% of emissions) | JRC's work programme |

# 2 European GHG emissions in 2020

A total of twenty-five Member States submitted preliminary 2020 GHG data to the European Commission and the EEA by 31 July 2021. Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and Sweden all submitted emissions data in the form of largely[2] complete CRF Summary2 tables. The methodologies used for any gap-filling are described in chapter 4.4.1.

These 25 countries that submitted 2020 proxy estimates represent more than 95 % of EU27 total emissions.

The EEA used gap-filled estimates for Bulgaria in order to have a complete approximated GHG inventory for the European Union (section 4.3).

Additionally three EEA member countries submitted preliminary 2020 GHG data by 31 July 2021: Iceland, Switzerland and Norway.[3]

Approximated GHG inventories in CRF Summary2 table format are presented for the EU27 in chapter 2.1.5. Annex 1: Detailed results for each Member State provides the CRF Summary2 tables for each of the 27 EU Member States and also for Iceland, Switzerland and Norway.

## 2.1 Trend and overall results

### *2.1.1 Changes in GHG emissions across the EU*

The estimates for 2020 indicate the decreasing trend of emissions reduction. Emissions levelled off between 2014 and 2017 (Figure 2.1), and the estimate for 2020 shows 9.8 % decrease compared to 2019 emissions level.

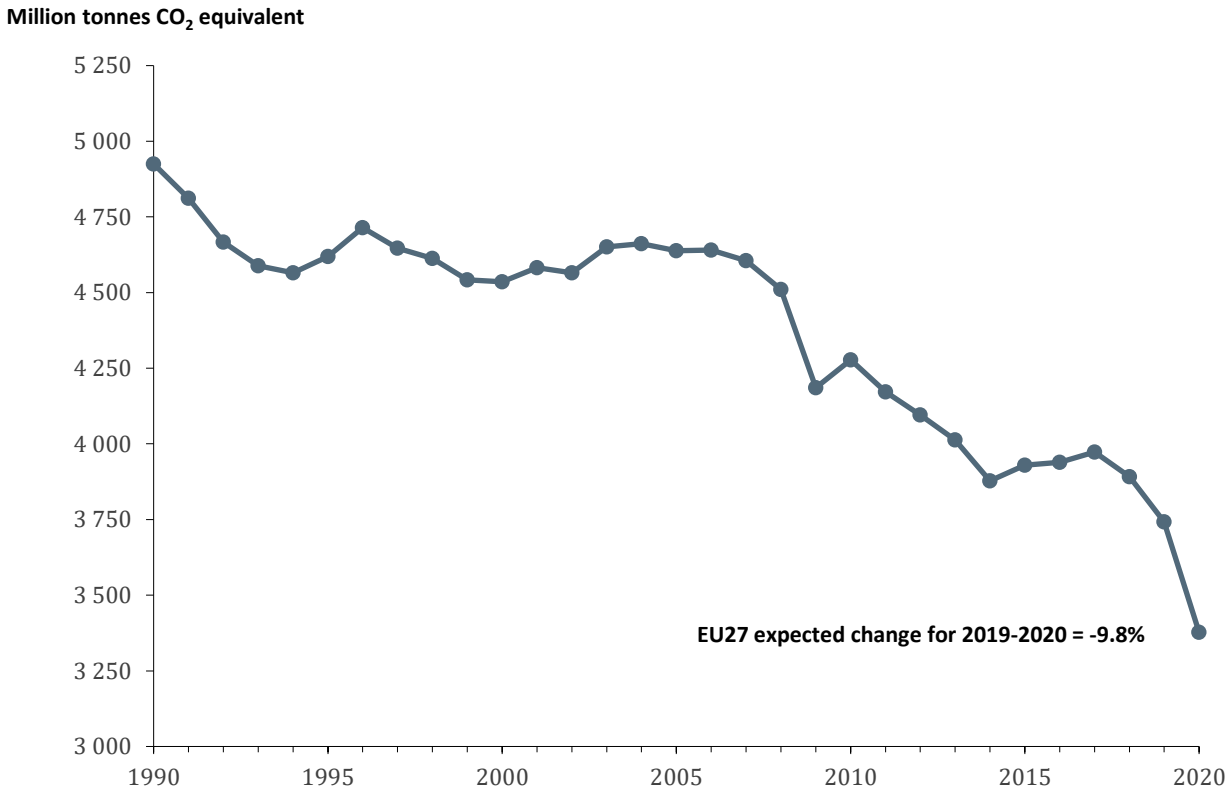
For EU27 the 2020 emissions are estimated to be 3377 million tonnes of $CO_2$ equivalents (Mt $CO_2$ eq.), which indicates a decrease from 2019 of 365.3 million tonnes of $CO_2$ equivalents (Mt $CO_2$ eq.).

International aviation equalled for EU27 to 61 million tonnes of $CO_2$ equivalents in 2020, which shows a decrease of 54.3 % in comparison to the 2019 levels.

(2) Where sub-sector emissions detail was not available it was gap-filled using simple allocation based on the previous year's plits. In some instances sub-sectors emissions needed to be summed for sectors. These minor modifications were performed for Denmark, Germany, Greece, Hungary, Ireland, Luxembourg and Sweden.

(3) Other non-EU Member States of the EEA are Liechtenstein and Turkey. As these countries did not submit any GHG data for 2020, they are not considered in this report.

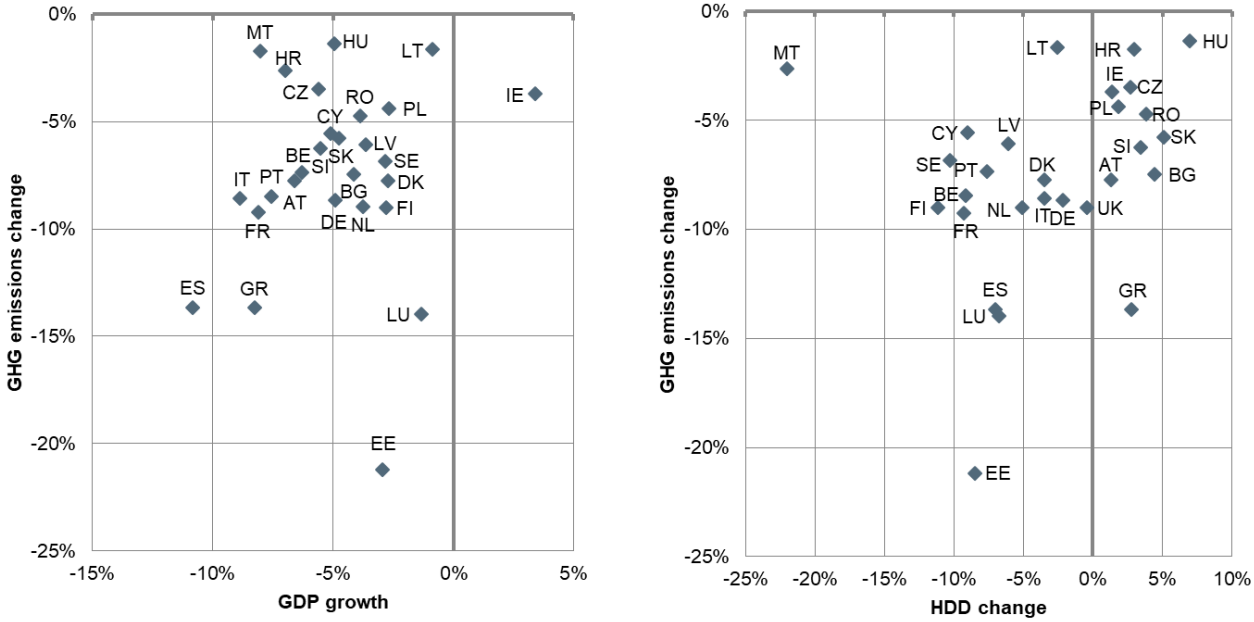
**Figure 2.1 Trends in total GHG emissions, 1990-2020**




**Note:** Total GHG emissions without LULUCF including indirect $CO_2$ and international aviation
**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

The trend shows 9.8 % decrease in emissions for the EU27 (total with international aviation) since 2019 and the GDP growth is showing correspondingly negative trend of 6.1 % in the same year (Figure 2.2). It can be seen that COVID-19 pandemic strongly affected Member States economics and GHG emissions as well. All Member States achieved decreases in emissions. All EU countries (except Ireland) had negative GDP growth.

**Figure 2.2 GHG emissions, GDP growth and heating degree days change 2019-2020**




**Note:** Heating Degree Days (HDDs) are an indication of heat demand based on outdoor temperatures. Positive HDD change can correlate with increased heating demand.
**Source:** EEA's ETC/CME, based on GDP from EEA (Gross domestic product at market prices, Chain linked volumes (2015), mrd euro) and Eurostat Heating Degree Days (HDDs), an indication of heat demand based on outdoor temperatures, from Eurostat. HDD change was not available for IS and EU27. Data for UK are available through https://www.gov.uk/government/statistics/energy-trends-section-7-weather

Climatic factors have a significant effect on energy demand and GHG emission trends. The exceptionally warm years were 2015, 2016, 2017, 2018, 2019 and 2020. The year 2020 was the warmest year for Europe (Copernicus, 2021). Furthermore, the warmest winter for 2019/2020 was noted. On the other hand, winter 2020/2021 was close to 1991-2020 average. The pattern in heating degree days (a standardized measure for linking heating demand and weather conditions) confirms slightly lower heating demand in 2020 compared to 2019. The highest amount of cooling degree days in 2020 was observed for Cyprus, Malta and Greece, as it is to be expected for these countries. Figure 2.2 also shows that in the 11 Member States heating degree days increased while total emissions decreased. Therefore the correlation between amount of heating degree days and total emissions is not very significant for many Member states.

### *2.1.2 Changes in EU GHG emissions by sector*

On a sectoral basis, the largest absolute emission decrease in the EU occurred in the energy sector (i.e. all combustion activities and fugitive emissions). Energy related emissions decreased by 271 Mt $CO_2$ eq. (-9.8 %) across the EU. Within the energy sector, emissions declined in energy industries (−118 Mt $CO_2$ eq.), particularly in heat and electricity production, in manufacturing industries and construction (-26 Mt $CO_2$ eq.), in residential and commercial (-18 Mt $CO_2$ eq.), in transport (−106 Mt $CO_2$ eq.) and in fugitive emissions from fuels (-2 Mt $CO_2$ eq.).

These changes in emissions in 2020 reflect large changes in the fuel mix. Primary fossil energy consumption decreased again in 2020, and the contribution of coal to the energy mix decreased in 2020 while the share of gas and renewable fuels increased. Wind and solar contributed the most to the

increase in renewable electricity while solid biofuels decreased slightly and hydro stayed stagnant[4]. Primary energy consumption of nuclear energy decreased as well as its contribution to the energy mix.

Consumption of coal, oil, gas and nuclear energy are primary energy consumption[5] values from the ETC energy efficiency proxy 2020. Renewable energy values are from the ETC RES proxy 2020. Hydro and wind are normalised.

The consumption of all fossil fuels; solid, liquid and gaseous; decreased in 2020. The consumption of gaseous fuels decreased by 2.2 % while consumption of liquid fuels decreased significantly by 11.8 % and solid fossil fuels consumption fell significantly as well by 19.1 %.

The gaseous fuels consumption increased in thirteen Member States with highest increases in Lithuania (17.7 %), Malta (14.8 %) and Greece (9.8 %). In thirteen Member States gaseous fuels consumption fell with the largest decrease in Denmark (-19.3 %) followed by Latvia (−17.1 %) and Spain (-9.7 %).

Liquid fossil fuels consumption decreased in 26 Member States with the largest decreases being in Malta (-27.7 %), Luxembourg (-21.4 %) and Spain (-18.2 %).

All the Member States showed decreasing solid fossil fuel consumption. The largest decreases were in Portugal (-54.7 %), Spain (-53.5 %) and Greece (-47.2 %). These changes in fossil fuel consumption are not only related to heating degree day (HDD) effects as described in section 2.1.1. but also strongly connected to the trends in electricity generation from fossil fuels and effects of the COVID-19 pandemic.

Renewable electricity generation continues to play an important role in GHG mitigation efforts by the EU and its Member States. Hydroelectric generation increased by 1.1 % across the EU with twelve Member States experiencing higher hydro electricity production in 2020 than in 2019. Hydro production decreased in fourteen Member States. The largest absolute decreases in gross hydro production were in Romania, Belgium and Sweden. The largest absolute increases in gross hydro production were in Spain, Italy and Portugal.

Electricity production from renewable sources increased significantly. Gross electricity generation from wind energy grew by 8.6 % in the EU across twenty Member States. The largest relative increases were in Malta (25.0 %), Belgium (24.8 %) and Luxembourg (23.7 %). The largest absolute contributions from wind energy were in Germany, France and Spain.

Increases in electricity production from photovoltaics were seen in most Member States (24) and production grew by 15.5 % across Europe, with very large relative increases in Ireland (198.7 %), Poland (180.1 %) and Finland (73.9 %). The largest absolute generation from photovoltaics was in Spain followed by Germany and Netherlands.

In 2020 nuclear energy production across the EU decreased by 10.3 % compared to 2019. The largest decreases in nuclear electricity generation occurred in Belgium (−20.9 %) followed by Sweden (-18.9 %) and Germany (-14.4 %). Nuclear electricity generation increased in five Member States. The highest increase was in Slovenia (9.1 %), followed by the Netherlands (5.0 %) and Romania (1.3 %).

The emissions from the sector Industrial Processes and Product Use decreased by 5.7 % between 2019 and 2020 in the EU27. The largest contribution to this emission decrease was from metal industry, which decreased by 10.1 %.

(4) ETC 2021, RES proxy 2020
(5) Primary energy consumption is calculated as final consumption non energy use subtracted from gross inland consumption.

Agriculture emissions decreased by 0.4 % mainly due emission decreases from enteric fermentation, and also agricultural soils, other carbon containing fertilisers, manure management and liming.

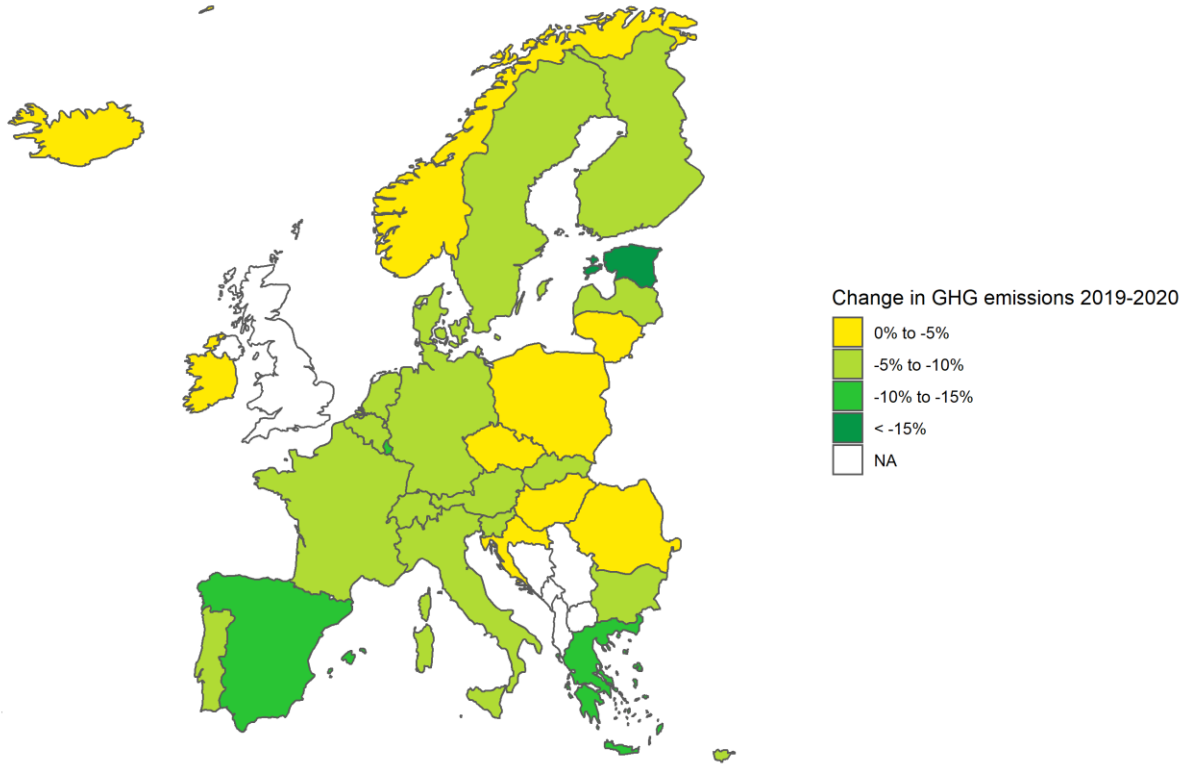
The trend in emissions from waste (−1.2 % compared to previous year) continues the decrease seen in previous years with largest reduction being in emissions from solid waste disposal.

Between 2019 and 2020 the emissions decreased by 11.6 % across stationary installations covered by the European Emissions Trading System for the EU, whereas emissions covered by the Effort Sharing Decision (ESD) decreased by 5.6 %.

### *2.1.3 Changes in member states GHG emissions 2019 to 2020*

Greenhouse gas emissions decreased in all EU Member States in 2020. Figure 2.3 depicts the regional distribution of these changes which differ significantly between different regions.

**Figure 2.3 Regional trends in total GHG emissions change 2019-2020**

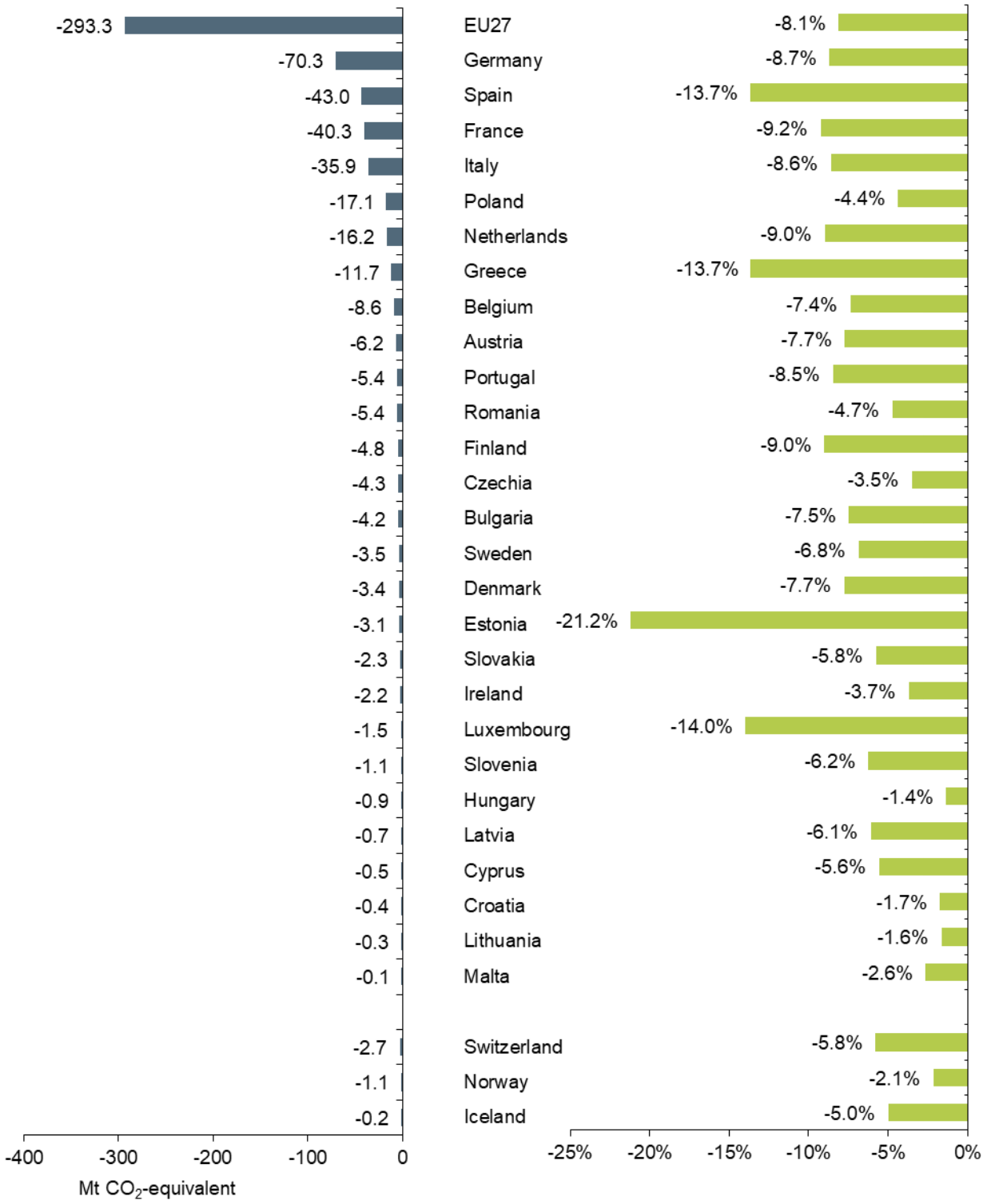



Comparing the changes across Member States (Figure 2.4), the largest absolute emission change occurred in Germany, where emissions decreased by 70 Mt $CO_2$ eq. Apparent decrease in emissions occurred also for Spain (-43 Mt $CO_2$ eq.), France (-40 Mt $CO_2$ eq.), Italy (-36 Mt $CO_2$ eq.), Poland (-17 Mt $CO_2$ eq.) and the Netherlands (-16 Mt $CO_2$ eq.).

The largest relative declines were in Estonia (-21.2%) and Luxembourg (−14.0 %).

In the non-EU member countries of the EEA, emissions decreased in Switzerland (-5.8 %, or -3 Mt $CO_2$ eq.), Norway (-2.1 % or -1 Mt $CO_2$ eq.) and Iceland (-5.0 % or -0.2 Mt $CO_2$ eq.).

**Figure 2.4 Member States' emissions, change 2019-2020**




The following section examines the emission trends for the members states which showed pronounced negative changes in emissions compared to the previous year.

***Member states with decreasing 2019 to 2020 emission trends***

The largest decrease was seen in Germany, the largest GHG emitter in the European Union. Emissions in Germany decreased by 70 Mt $CO_2$ eq. or 8.7 %. Consumption of solid fossil fuels decreased by 17.5 %, consumption of natural gas by 2.4 % and consumption of oil by 9.4 %. Consumption of renewable energies including hydro increased by 3.7%. Nuclear energy decreased by 14.4 %. Emissions from 1.A.1 Energy industries fell the most (-37 Mt $CO_2$ eq. or -15.0 %), followed by 1.A.3 Transport (-19 Mt $CO_2$ eq. or -11.4 %), 1.A.2 Manufacturing industries and construction (-6 Mt $CO_2$ eq. or -4.4 %), 1.A.4 Other sectors (−3 Mt $CO_2$ eq. or −2.6 %) and the other minor categories. Emissions of Industrial processes and product use decreased by 3 Mt $CO_2$ eq. (-5.2 %), mainly from metal industry. Emissions from Agriculture decreased by 1 Mt $CO_2$ eq. or 2.3 % and emissions from Waste are estimated to fall by 0.3 Mt $CO_2$ eq. or 3.8 %.

In Spain, emissions fell by 43 Mt $CO_2$ eq. or 13.7 %. Consumption of oil decreased by 18.2 %, natural gas consumption decreased by 9.7 %. The consumption of solid fossil fuels declined significantly by 53.5 %. Consumption of renewable energy including hydro grew by 4.0% and nuclear energy decreased by 0.1%. Emissions from 1.A.1 Energy industries fell the most (-16 Mt $CO_2$ eq. or -28.6 %) followed by a decrease in 1.A.3 Transport (-16 Mt $CO_2$ eq. or -17.6 %) and the other energy sector categories. Industrial processes and product use decreased (-3 Mt $CO_2$ eq. or -12.6 %) as well. On the contrary, emissions from Agriculture slightly increased (0.5 Mt $CO_2$ eq. or 1.2 %) as well as emissions from Waste (0.1 Mt $CO_2$ eq. or 0.5 %).

In France, emissions fell by 40 Mt $CO_2$ eq. or 9.2 %. Consumption of oil decreased by 15.6 %, natural gas consumption decreased by 6.6 %. The consumption of solid fossil fuels declined significantly by 26.0 %. Consumption of renewable energy including hydro decreased by 1.6% and nuclear energy decreased by 11.6%. Emissions from 1.A.3 Transport fell the most (-22 Mt $CO_2$ eq. or -16.7 %) followed by the other energy sector categories. Industrial processes and product use decreased (-5 Mt $CO_2$ eq. or -10.6 %) as well. Emissions from Agriculture decreased very slightly (-0.1 Mt $CO_2$ eq. or 0.2 %) as well as emissions from Waste (0.2 Mt $CO_2$ eq. or 1.0 %).

In Italy, emissions decreased by 36 Mt $CO_2$ eq. or 8.6 %. Natural gas consumption decreased by 4.4 %, oil consumption decreased by 16.4 % and solid fossil fuels consumption decreased by 25.9 %. Renewables including hydro decreased only slightly by 0.6%. The largest fall in emissions is apparent for 1.A.3 Transport where the decrease is 18 Mt $CO_2$ eq. or 17.4 % followed by 1.A.1 Energy industries where the decrease is 10 Mt $CO_2$ eq. or 11.1 %. The emissions from Industrial processes and product use decreased by 0.9 Mt $CO_2$ eq. or 2.6 % as well as in Agriculture (-0.4 Mt $CO_2$ eq. or -1.3 %) and Waste (-0.8 Mt $CO_2$ eq. or -4.6 %).

In Poland, GHG emissions declined by 17 Mt $CO_2$ eq. or 4.4 %. There has been a strong decline in the use of solid fossil fuels (−10.1 %), oil consumption decreased as well (-4.7 %) while the use of natural gas slightly increased (3.2 %). Consumption of energy from renewable sources including hydro grew 4.7%. The largest emission decrease was apparent in 1.A.1 Energy industries (−11 Mt $CO_2$ eq. or −7.3 %). Emissions decreased also in the other energy sector categories. In contrast the other sectors saw fewer changes in emissions. Industry sector decreased very slightly (-0.2 Mt CO2 eq. or -0.9 %). Emissions from Agriculture and Waste sector slightly increased (0.4 Mt $CO_2$ eq. or 1.2 % and 0.1 Mt $CO_2$ eq. or 1.1 %).

In the Netherlands, GHG emissions declined by 16 Mt $CO_2$ eq. or 9.0 %. There has been a strong decline in the use of solid fossil fuels (−35.6 %). Oil consumption decreased slightly (-3.1 %) as well as the use of natural gas (-1.9 %). Consumption of energy from renewable sources including hydro grew again strongly by 26.5%. The largest emission decrease was apparent in 1.A.1 Energy industries (−9 Mt $CO_2$ eq. or −15.6 %). Emissions decreased also in the other energy sector categories (except 1.A.5 Other). Industry sector

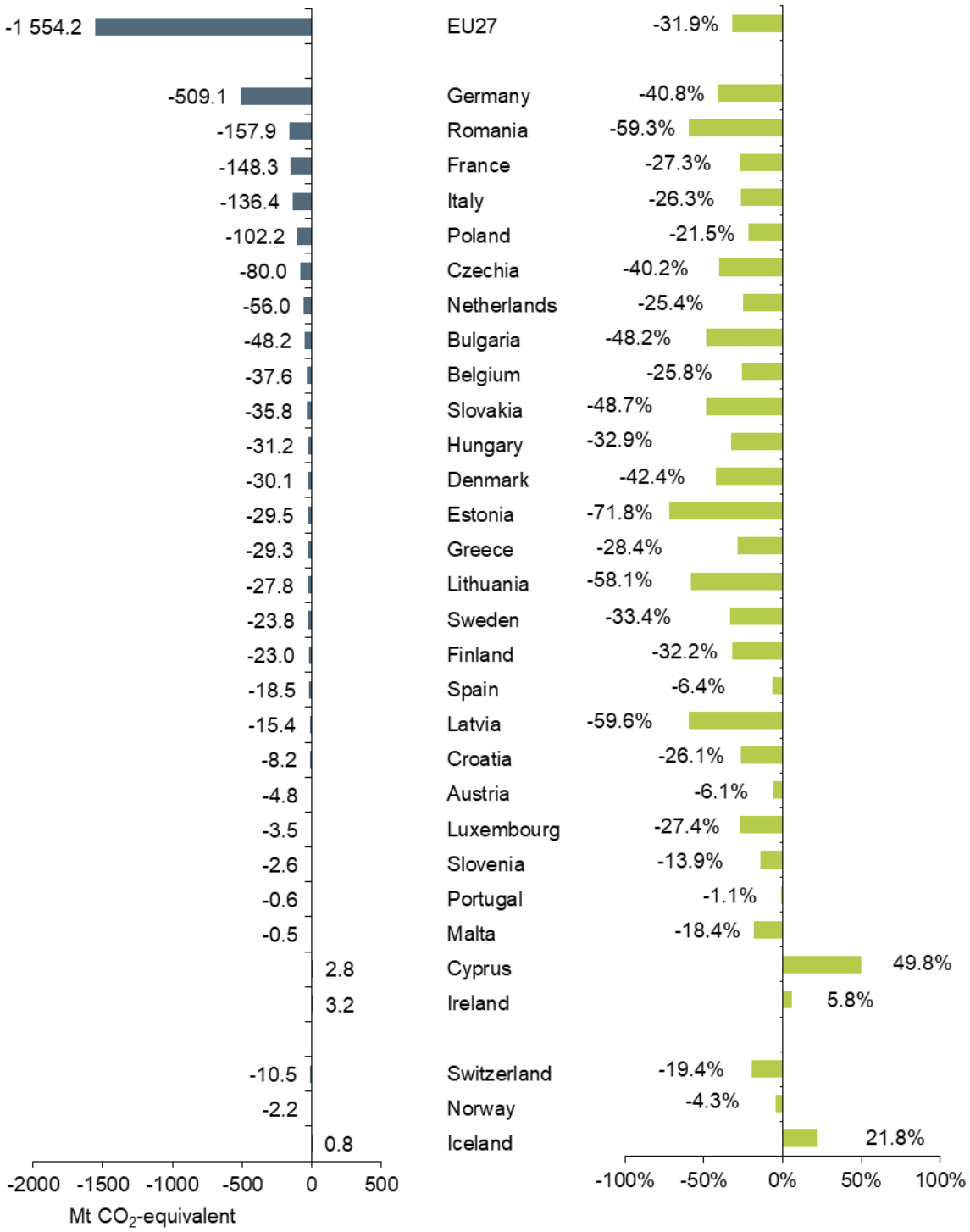
decreased by -0.8 Mt CO2 eq. or -7.7 %). Emissions from Agriculture decreased very slightly (-0.05 Mt $CO_2$ eq. or -0.3 %) and from Waste as well (-0.1 Mt $CO_2$ eq. or -3.7 %).

The largest relative decrease was seen in Estonia. Emissions in Estonia decreased by 21.2 %, significantly more than in any other Member State. On the sectoral basis, the most apparent change is noted for the Energy sector (-3 Mt $CO_2$ eq. or -23.1 %) where the biggest relative decrease of -38.9 % is reported in 1.A.2 Manufacturing industries and construction. Consumption of energy from renewable sources including hydro grew 5.7% in Estonia.

### *2.1.4 Changes in member states GHG emissions 1990 to 2020*

Total EU27 GHG emissions in 2020 are estimated to be −31.9 % or −1554 Mt $CO_2$ eq. below 1990 levels as shown in Figure 2.5. Total emissions including emissions from international aviation are estimated to be 31.4 % below 1990 levels, showing a reduction of 1548 Mt $CO_2$ eq. Emissions for most EU27 Member States are lower than in 1990 while emissions in Cyprus and Ireland are higher than in 1990. The largest absolute decrease was in Germany, followed by Romania, France, Italy and Poland which all reduced their GHG emissions by more than 100 Mt $CO_2$ eq. since 1990. The largest absolute increase was experienced by Ireland with 3.2 Mt $CO_2$ eq., followed by Cyprus (2.8 Mt $CO_2$ eq.).

**Figure 2.5 Member States' emissions change 1990-2020**




The largest relative emission decreases were in Estonia, Latvia, Romania and Lithuania, which all reduced their emissions by more than 50 % compared to 1990. The relative emission decreases of further eight Member States are stronger than the EU27 as a whole.

Of the three non-EU member countries of the EEA considered in this report only Iceland had in 2020 higher GHG emissions compared to 1990 level.

### *2.1.5 Detailed results for the EU27*

This section begins with a brief comparison of the effect of including emissions from international aviation in the totals. Table 2.1 summarises the emissions as $CO_2$ eq. and percentage changes. It should be noted, that in their proxy submissions, a number of Member States used the 2019 value for emissions from international aviation as an approximated value for 2020. Flight and emissions data from Eurocontrol was used to gap-fill international aviation emissions where Member States did not include an estimate. For the EU 2020 proxy, this method was applied to seven countries.

**Table 2.1 Emissions including international aviation (kt $CO_2$ eq.)**

| European Union (EU27) | 1990 | 2019 | 2020 | 2020-2019 | 2020/2019 | 2020-1990 | 2020/1990 |
|---|---|---|---|---|---|---|---|
| Total excl. LULUCF incl. indirect $CO_2$ | 4 870 956 | 3 610 052 | 3 316 739 | -293 313 | -8.12% | -1 554 217 | -31.91% |
| International aviation | 54 153 | 132 589 | 60 652 | -71 938 | -54.26% | 6 498 | 12.00% |
| Total $CO_2$eq. including international aviation | 4 925 109 | 3 742 641 | 3 377 390 | -365 250 | -9.76% | -1 547 719 | -31.43% |

Table 2.2 shows the detailed results for the EU27. Summary tables for 2020 for each Member State as submitted by the Member States or gap-filled by EEA for Member States which did not submit their own approximated emissions report are provided in Annex 1.

## Table 2.2 Summary table of approximated GHG emissions for 2020 for EU27 (total emissions including indirect $CO_2$)

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country EU27
Geographical scope Sum of the 27 MS

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$ [1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 2 367 743 | 380 205 | 228 638 | 63 245 | 3 012 | 5 276 | 1 650 | 50 | 3 066 942 | | |
| **1. Energy** | 2 406 137 | 65 879 | 24 106 | | | | | | 2 496 122 | | |
| A. Fuel combustion (sectoral approach) | 2 386 129 | 21 753 | 24 045 | | | | | | 2 431 928 | | |
| 1. Energy industries | 773 086 | 4 282 | 5 406 | | | | | | 782 774 | | |
| 2. Manufacturing industries and construction | 403 641 | 2 218 | 3 562 | | | | | | 409 422 | | |
| 3. Transport | 719 851 | 1 398 | 7 740 | | | | | | 728 989 | | |
| 4. Other sectors | 484 515 | 13 834 | 7 279 | | | | | | 505 629 | | |
| 5. Other | 5 037 | 20 | 57 | | | | | | 5 115 | | |
| B. Fugitive emissions from fuels | 20 007 | 44 126 | 61 | | | | | | 64 194 | | |
| 1. Solid fuels | 3 526 | 23 488 | 0 | | | | | | 27 014 | | |
| 2. Oil and natural gas | 16 481 | 20 637 | 61 | | | | | | 37 179 | | |
| C. $CO_2$ transport and storage | - | | | | | | | | - | | |
| **2. Industrial processes and product use** | 219 969 | 1 401 | 8 837 | 63 245 | 3 012 | 5 276 | 1 650 | 50 | 320 562 | | |
| A. Mineral industry | 98 912 | | | | | | | | 98 912 | | |
| B. Chemical industry | 46 091 | 1 187 | 6 318 | 1 052 | 1 654 | 4 | 46 | - | 56 351 | | |
| C. Metal industry | 65 968 | 132 | 13 | 17 | 397 | 70 | - | - | 66 596 | | |
| D. Non-energy products from fuels and solvent use | 8 406 | 2 | 4 | | | | | | 8 412 | | |
| E. Electronic Industry | | | | 791 | 526 | 131 | 24 | 50 | 1 521 | | |
| F. Product uses as ODS substitutes | | | | 61 370 | 88 | - | 1 428 | - | 79 488 | | |
| G. Other product manufacture and use | 547 | 71 | 2 423 | 14 | 346 | 5 068 | - | - | 8 990 | | |
| H. Other | 45 | 8 | 79 | 2 | 1 | 4 | 153 | - | 292 | | |
| **3. Agriculture** | 9 171 | 204 163 | 171 085 | | | | | | 384 418 | | |
| A. Enteric fermentation | | 163 223 | | | | | | | 163 223 | | |
| B. Manure management | | 36 519 | 19 100 | | | | | | 55 619 | | |
| C. Rice cultivation | | 2 618 | | | | | | | 2 618 | | |
| D. Agricultural soils | | - | 151 548 | | | | | | 151 548 | | |
| E. Prescribed burning of savannas | | - | - | | | | | | - | | |
| F. Field burning of agricultural residues | | 487 | 179 | | | | | | 666 | | |
| G. Liming | 4 768 | | | | | | | | 4 768 | | |
| H. Urea application | 3 884 | | | | | | | | 3 884 | | |
| I. Other carbon-containing fertilizers | 519 | | | | | | | | 519 | | |
| J. Other | - | 1 316 | 258 | | | | | | 1 573 | | |
| **4. Land use, land-use change and forestry[1]** | - 270 200 | 6 493 | 15 461 | | | | | | - 248 246 | | |
| A. Forest land | - 348 526 | 2 773 | 5 130 | | | | | | - 340 623 | | |
| B. Cropland | 44 437 | 658 | 3 989 | | | | | | 49 085 | | |
| C. Grassland | 12 766 | 1 802 | 530 | | | | | | 15 098 | | |
| D. Wetlands | 15 843 | 832 | 284 | | | | | | 16 959 | | |
| E. Settlements | 40 395 | 137 | 4 370 | | | | | | 44 902 | | |
| F. Other land | 504 | 71 | 1 158 | | | | | | 1 733 | | |
| G. Harvested wood products | - 35 665 | | | | | | | | - 35 665 | | |
| H. Other | 46 | 218 | - | | | | | | 264 | | |
| **5. Waste** | 2 666 | 102 270 | 9 150 | | | | | | 114 086 | | |
| A. Solid waste disposal | - | 80 922 | | | | | | | 80 922 | | |
| B. Biological treatment of solid waste | | 4 445 | 2 153 | | | | | | 6 598 | | |
| C. Incineration and open burning of waste | 2 643 | 517 | 596 | | | | | | 3 755 | | |
| D. Waste water treatment and discharge | | 16 381 | 6 368 | | | | | | 22 749 | | |
| E. Other | 23 | 6 | 33 | | | | | | 62 | | |
| **6. Other** ***(as specified in summary 1.A)*** | - | - | - | | | | | | - | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | 0.00 | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | 55 915 | 9 | 510 | | | | | | 60 652 | | |
| Navigation | NE | NE | NE | | | | | | NE | | |
| **Multilateral operations** | 1 | - | - | | | | | | 1 | | |
| **$CO_2$ emissions from biomass** | 352 992 | | | | | | | | 427 638 | | |
| **$CO_2$ captured** | 102 | - | | | | | | | 102 | | |
| **Long-term storage of C in waste disposal sites** | 156 548 | - | | | | | | | 156 548 | | |
| **Indirect $N_2O$** | | | 4 190 | | | | | | | | |
| **Indirect $CO_2$ [3]** | 1 551 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 3 315 188 | 1 329 632 | 2 395 909 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 3 066 942 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 3 316 739 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 3 068 492 | | |

[1] For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and for

[2] See footnote 7 to table Summary 1.A.

[3] In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

## 2.2 Sectoral results

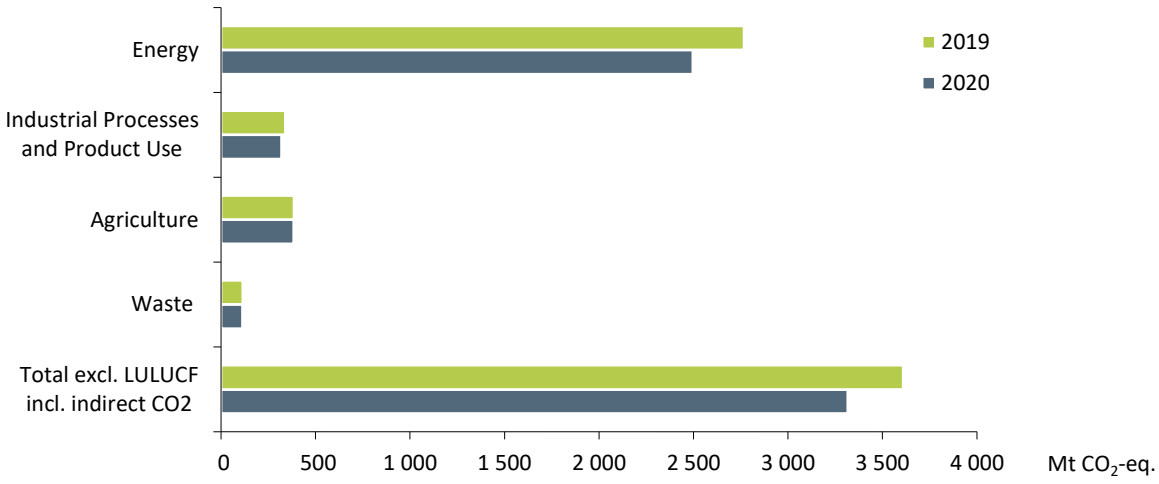
Table 2.3 and Figure 2.6 show the changes between 2019 and 2020 at the sectoral level for the EU27.

**Table 2.3 Emissions by sector, change 2019-2020**

| Change 2019 / 2020, EU27 | Mt $CO_2$ eq. | % |
|---|---|---|
| Energy | -271.2 | -9.8% |
| Industrial Processes and Product Use | -19.2 | -5.7% |
| Agriculture | -1.4 | -0.4% |
| Waste | -1.4 | -1.2% |
| Total excl. LULUCF incl. indirect $CO_2$ | -293.3 | -8.1% |

**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

**Figure 2.6 Emissions by sector, EU27, 2019-2020**




**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

On a sectoral basis, the largest absolute emission change occurred in the Energy sector (i.e. all combustion activities and fugitive emissions from energy). GHG emissions decreased by -271 Mt $CO_2$ eq. (-9.8 %) across the EU. More detailed explanations for the trends in the energy sector are provided in section 2.2.1.

The greenhouse gas emissions from Industrial Processes and Product Use decreased by 19 Mt $CO_2$ eq. (-5.7 %), the agricultural sector experienced a decrease of 1.4 Mt $CO_2$ eq. (-0.4 %) and the waste sector indicated a decrease of 1.4 Mt $CO_2$ eq. (−1.2 %).

### *2.2.1 Energy*

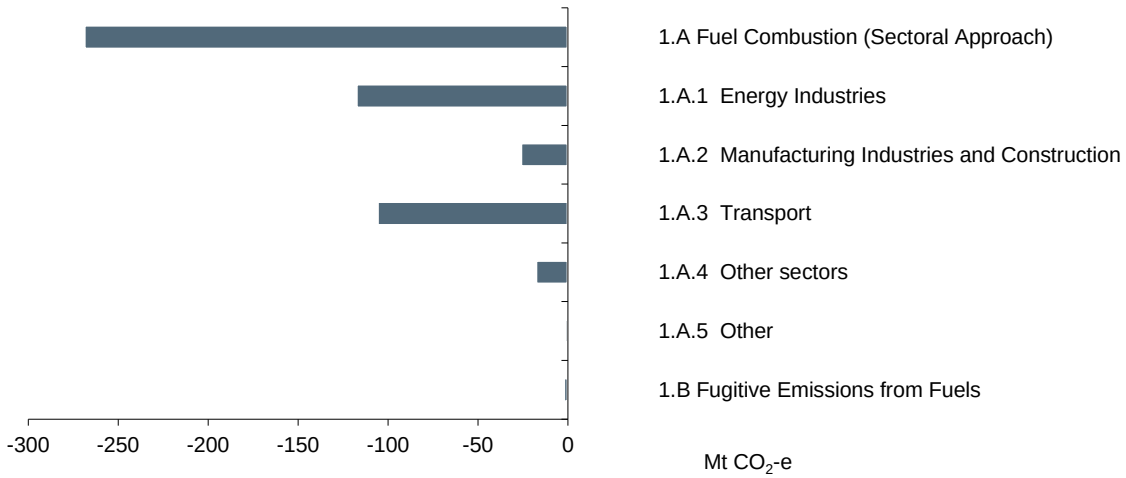
Emissions from the energy sector contributed about 77 % of total EU emissions in 2019 and is expected to keep the share of 75 % of total EU emissions for 2020. Emissions from fuel combustion saw a decrease of 269 Mt $CO_2$ eq. or 10.0 % compared to 2019. Table 2.4 shows that the largest change in fuel combustion emissions occurred in 1.A.1 Energy Industries with a decrease of 118 Mt $CO_2$ eq. (-13.1%). In the sector 1.A.3 Transport, emissions also decreased (-106 Mt $CO_2$ eq. or -12.7 %) as well as emissions in 1.A.2 Manufacturing industries and construction (-26 Mt $CO_2$ eq. or -6.0 %), 1.A.4 Other sectors (-18 Mt $CO_2$ eq. or -3.4 %), 1.A.5 Other (-2 Mt $CO_2$ eq. or −23.3 %) and 1.B Fugitive emissions from fuels (-2 Mt $CO_2$ eq. or −3.5 %).

**Table 2.4 Energy sector emissions, change 2019-2020**

| Change 2019 / 2020, EU27 | Mt $CO_2$eq | % |
|---|---|---|
| 1.A Fuel Combustion (Sectoral Approach) | -268.9 | -10.0% |
| 1.A.1 Energy Industries | -117.6 | -13.1% |
| 1.A.2 Manufacturing Industries and Construction | -26.0 | -6.0% |
| 1.A.3 Transport | -105.9 | -12.7% |
| 1.A.4 Other sectors | -17.8 | -3.4% |
| 1.A.5 Other | -1.6 | -23.3% |
| 1.B. Fugitive Emissions from Fuels | -2.3 | -3.5% |

**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

**Figure 2.7 Energy sector emissions, EU27 change 2019-2020 (Mt $CO_2$ eq.)**




**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

The only increase in emissions for 1.A Fuel Combustion on Member States level was noted for Lithuania (nevertheless the increase is less than 0.1 Mt $CO_2$ eq.). The largest emission decrease was in Germany (−65 Mt $CO_2$ eq.) followed by Spain (−40 Mt $CO_2$ eq.), France (−34 Mt $CO_2$ eq.) and Italy (−34 Mt $CO_2$ eq.). Going to more detail in the subcategory 1.A.1 Energy Industries, the largest reduction was in Germany (−37 Mt $CO_2$ eq.), followed by Spain (−16 Mt $CO_2$ eq.) and Poland (−11 Mt $CO_2$ eq.). The increases were only minor, with the largest change noted for Lithuania (+0.4 Mt $CO_2$ eq.). Emissions changes in the sector 1.A.2 Manufacturing Industries and Construction were significantly smaller. The largest decrease was in Germany (-6 Mt $CO_2$ eq.). Emissions from 1.A.3 Transport significantly decreased, increases were identified only in two Member States. The largest increase was in Estonia (+0.2 Mt $CO_2$ eq.), while the largest decrease is noted for France (−22 Mt $CO_2$ eq.) in absolute values and in relative values the most significant decrease was noted for Luxembourg (-22 %). In 1.A.4 Other Sectors (which include residential and commercial sectors) emissions increased in nine Member States. The largest increase occurred in Hungary (+0.6 Mt $CO_2$ eq.). The largest decrease was in France (−4 Mt $CO_2$ eq.). Emission changes in the sector 1.A.5 Other are significant only for France where emissions decreased by 2 Mt $CO_2$ eq. In the other Member States are changes less than ±0.2 Mt $CO_2$ eq. For the subcategory 1.B Fugitive Emissions from fuels, the changes for all Member States is less then ±1.0 Mt $CO_2$ eq.

### *2.2.2 Industrial Processes and Product Use*

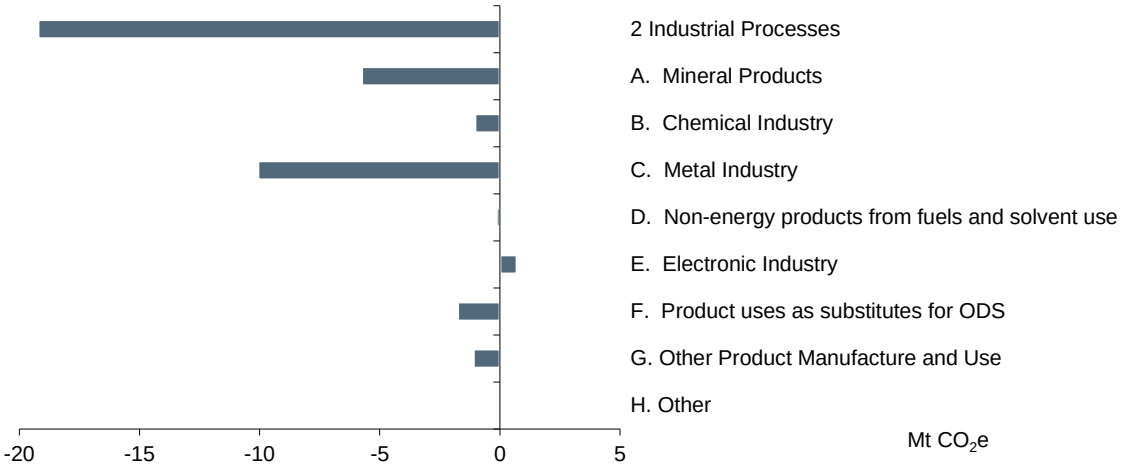
The Sector Industrial Processes and Product Use (IPPU) contributes to about 9 % of total EU emissions and is the third most important source after energy and agriculture. Emissions from Industrial Processes decreased by 19 Mt $CO_2$ eq. in the EU (-5.7 %). Table 2.5 and Figure 2.8 show the subsector contribution to this trend in emissions. The largest emission decrease occurred in the subsector 2.C Metal industry followed by the 2.A Mineral Products.

**Table 2.5 Industrial Processes and Product Use emissions, change 2019-2020**

| Change 2019 / 2020, EU27 | Mt $CO_2$ eq. | % |
|---|---|---|
| 2 Industrial Processes | -19.2 | -5.7% |
| A. Mineral Products | -5.8 | -5.5% |
| B. Chemical Industry | -1.0 | -1.8% |
| C. Metal Industry | -10.1 | -13.1% |
| D. Non-energy products from fuels and solvent use | -0.1 | -1.6% |
| E. Electronic Industry | 0.7 | 87.3% |
| F. Product uses as substitutes for ODS | -1.8 | -2.2% |
| G. Other Product Manufacture and Use | -1.1 | -10.9% |
| H. Other | -0.1 | -22.3% |

**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

**Figure 2.8 Industrial Processes and Product Use emissions, EU27, change 2019-2020 (Mt $CO_2$ eq.)**




**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

In six of the EU27 Member States emissions from IPPU increased. The largest increase of IPPU emissions was in Czechia (+0.4 Mt $CO_2$ eq.) while the largest decreases were in France (−5 Mt $CO_2$ eq.) followed by Spain (−3 Mt $CO_2$ eq.) and Germany (−3 Mt $CO_2$ eq.). In the subcategory 2.A Mineral Products, emissions decreased by -2 Mt $CO_2$ eq. for Spain, while the highest increase in Denmark is only +0.1 Mt $CO_2$ eq. Emissions from 2.B Chemical Products decreased in the EU (-1 Mt $CO_2$ eq. or −1.8 %). The largest increases were in Italy (+0.7 Mt $CO_2$ eq.) while the largest decrease was in France (−0.9 Mt $CO_2$ eq.). Emissions from 2.C Metal Industry decreased by -10 Mt $CO_2$ eq. or -13.1 % with the largest increase in Czechia (less than +0.1 Mt $CO_2$ eq.) while the largest decrease occurred in France (−3 Mt $CO_2$ eq.). The subsector 2.D Non-energy Products from Fuels and Solvent Use has had only slight decrease in the emissions (-0.1 Mt $CO_2$ eq. or -1.6 %). The changes in all Member States were less than ±0.1 Mt $CO_2$ eq. The subsector 2.E Electronic Industry showed slight absolute emission changes for the EU (+0.7 Mt $CO_2$ eq. or 87.3 %). This change is mainly driven by increase in Ireland (+0.8 Mt $CO_2$ eq.). Emissions changes for the other Member States were within ±0.1 Mt $CO_2$ eq. The subsector 2.F Product uses as substitutes for ODS saw emissions decrease by 2 Mt $CO_2$ eq. (−2.2 %). In nine Member States emissions increased in this source category, in 13 Member States emissions decreased and five Member States report no changes. The largest decrease of emissions was in Spain, where 2.F emissions fell by 0.9 Mt $CO_2$ eq., followed by Ireland (−0.8 Mt $CO_2$ eq.). In contrast, emissions increased the most in Greece (+0.5 Mt $CO_2$ eq.). All other emission changes where less than ±0.5 Mt $CO_2$ eq. Emissions from 2.G Other Product Manufacture and Use decreased slightly for the EU (-1.1 Mt $CO_2$ eq. or -10.9 %). The greatest emission change is reported by Germany (−0.9 Mt $CO_2$ eq.). Emission changes of the other Member States are less than ±0.1 Mt $CO_2$ eq. The decrease of emissions from 2.H Other is almost irrelevant by absolute terms (−0.1 Mt $CO_2$ eq.) but significant in relative terms (−22.3 %).

### *2.2.3 Agriculture*

Agriculture (excluding LULUCF) contributes to 11 % of European GHG emissions. Emissions from agriculture decreased by 1 Mt $CO_2$ eq. or 0.4 % since 2019. The largest greenhouse gas emitting activities within the sector are $CH_4$ from livestock and $N_2O$ from soils. Enteric fermentation and soils contributed about 43 % and 39 % of the sector's emissions respectively. As shown in Table 2.6 and Figure 2.9 the decrease in agriculture sector emissions is largely driven by decreased emissions from enteric fermentation, but agricultural soil, other carbon containing fertilizers, liming and manure management contributed to this decrease as well.

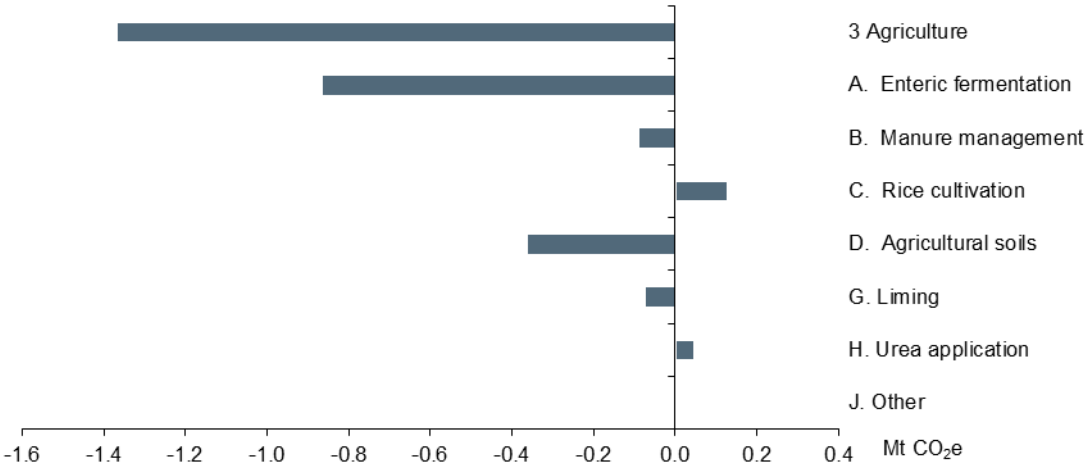
Table 2.6 and Figure 2.9 show the subsector 2019-2020 change, with $CH_4$ and $N_2O$ emissions shown as $CO_2$ equivalents (Mt $CO_2$ eq.).

**Table 2.6 Agriculture sector emissions, change 2019-2020**

| Change 2019 / 2020, EU27 | Mt $CO_2$ eq. | % |
|---|---|---|
| 3 Agriculture | -1.4 | -0.4% |
| A. Enteric fermentation | -0.9 | -0.5% |
| B. Manure management | -0.1 | -0.2% |
| C. Rice cultivation | 0.1 | 5.2% |
| D. Agricultural soils | -0.4 | -0.2% |
| E. Prescribed burning of savannas | 0.0 | - |
| F. Field burning of agricultural residues | 0.0 | 1.1% |
| G. Liming | -0.1 | -1.6% |
| H. Urea application | 0.0 | 1.2% |
| I. Other carbon-containing fertilizers | -0.2 | -23.0% |
| J. Other | 0.0 | 0.0% |

**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

**Figure 2.9 Agriculture sector emissions, EU27, change 2019-2020 (Mt $CO_2$ eq.)**




**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

Emissions from Enteric Fermentation decreased by 0.9 Mt $CO_2$ eq. or 0.5 %. The largest decreases were in Germany and Italy (both -0.5 Mt $CO_2$ eq.). Emissions of $CH_4$ and $N_2O$ from manure management contribute to about 15 % of the agriculture sector and have decreased by 0.1 Mt $CO_2$ eq. or -0.2 %. The largest increase was in Spain (0.2 Mt $CO_2$ eq.) and the largest decrease was in Czechia (-0.2 Mt $CO_2$ eq.). Agricultural soils contribute to about 39 % of the emissions from agriculture and have decreased by 0.4

Mt $CO_2$ eq. or 0.2 %. The largest increases were seen in Poland (0.2 Mt $CO_2$ eq.). The largest decrease was in Germany (-0.6 Mt $CO_2$ eq.).

### *2.2.4 Waste*

The Waste sector contributes to about 3 % of European emissions. Waste related emissions continue to decrease reflecting the large relative proportion of emissions from solid waste disposal (71 % share on Waste emissions) and the ongoing effect of restrictions on landfilling of organic degradable waste that was implemented decades ago.

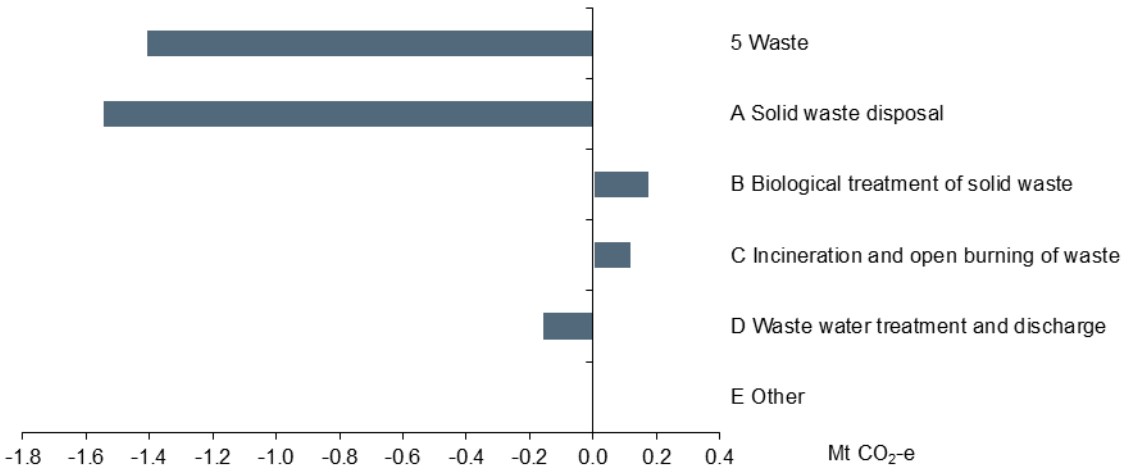
Emissions from the Waste sector decreased by −1 Mt $CO_2$ eq. compared to 2019. Table 2.7 and Figure 2.10 show the subsector contributions to this trend in emissions.

**Table 2.7 Waste sector emissions, change 2019-2020**

| Change 2019/2020, EU27 | Mt $CO_2$ eq. | % |
|---|---|---|
| 5 Waste | -1.4 | -1.2% |
| A Solid Waste Disposal | -1.6 | -1.9% |
| B Biological Treatment of Solid Waste | 0.2 | 2.8% |
| C Incineration and Open burning of Waste | 0.1 | 3.3% |
| D Waste Water Treatment and Discharge | -0.2 | -0.7% |
| E Other | 0.0 | -0.8% |

**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

**Figure 2.10 Waste sector emissions, EU27, change 2019-2020 (Mt $CO_2$ eq.)**




**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019 and proxy estimates for 2020.

The largest decrease of waste emissions was noted for Italy (-0.8 Mt $CO_2$ eq.). The trends of 5.A Solid Waste emissions generally dominate the waste sector. 16 Member States decreased emissions from

solid waste (largest decrease in Italy with −0.9 Mt $CO_2$ eq.) while four Member States had an increase in emissions (the largest one in Czechia with +0.4 Mt $CO_2$ eq.) For the remaining Member States constant emissions were estimated.

## 2.3 ETS versus ESD emissions

Within the European Union there are two policy instruments for achieving the GHG emission reductions: One part is covered by the EU Emissions Trading System (ETS) while the other is the Effort Sharing Decision (ESD). ESD emissions are calculated by deducting ETS emissions, $CO_2$ emissions from domestic aviation and $NF_3$ emissions from total emissions including indirect $CO_2$ emissions. LULUCF is excluded from ESD emissions.

$$\boldsymbol{E_{ESD} = E_{total} - E_{ETS} - E_{1A3a,CO2} - E_{NF3}}$$

| | |
|---|---|
| $E_{ESD}$ | Emission under Effort Sharing Decision |
| $E_{total}$ | Total emissions excl. LULUCF incl. indirect $CO_2$ |
| $\boldsymbol{E_{ETS}}$ | Emissions included in the ETS |
| $E_{1A3a,CO2}$ | $CO_2$ emissions from domestic aviation |
| $E_{NF3}$ | $NF_3$ emissions |

Table 2.8 shows total, ETS and ESD emissions per country. ETS emissions are taken from the EEA ETS data viewer (European Union Emissions Trading System data viewer, 5 August 2021) for stationary installations, ESD emissions are calculated as described in the formula above. Relative changes in emissions between the years 2019 and 2020 can be seen on the right.

**Table 2.8 Total, ETS and ESD emissions 2019 and 2020, kt $CO_2$ eq.**

| MS | 2019 GHG emissions | | | 2020 GHG emissions | | | Change 2020 versus 2019 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | ETS | ESD | Total | ETS | ESD | Total | ETS | ESD |
| AT | 79 842 | 29 562 | 50 221 | 73 662 | 27 034 | 46 598 | -7.7% | -8.6% | -7.2% |
| BE | 116 651 | 44 627 | 72 014 | 108 070 | 41 512 | 66 552 | -7.4% | -7.0% | -7.6% |
| BG | 55 955 | 29 194 | 26 740 | 51 778 | 23 845 | 27 921 | -7.5% | -18.3% | 4.4% |
| CY | 8 850 | 4 472 | 4 378 | 8 357 | 4 295 | 4 062 | -5.6% | -4.0% | -7.2% |
| CZ | 123 298 | 62 519 | 60 766 | 118 981 | 54 676 | 64 296 | -3.5% | -12.5% | 5.8% |
| DE | 809 799 | 363 315 | 444 254 | 739 495 | 320 275 | 418 482 | -8.7% | -11.8% | -5.8% |
| DK | 44 241 | 12 041 | 32 051 | 40 815 | 10 832 | 29 861 | -7.7% | -10.0% | -6.8% |
| EE | 14 699 | 8 486 | 6 209 | 11 583 | 5 617 | 5 964 | -21.2% | -33.8% | -4.0% |
| ES | 314 529 | 109 523 | 201 879 | 271 506 | 89 039 | 180 960 | -13.7% | -18.7% | -10.4% |
| FI | 53 072 | 23 242 | 29 625 | 48 289 | 19 578 | 28 625 | -9.0% | -15.8% | -3.8% |
| FR | 435 999 | 94 304 | 336 358 | 395 716 | 82 012 | 310 541 | -9.2% | -13.0% | -7.7% |
| GR | 85 631 | 40 476 | 44 745 | 73 941 | 31 728 | 41 999 | -13.7% | -21.6% | -6.1% |
| HR | 23 605 | 7 515 | 16 058 | 23 198 | 7 322 | 15 859 | -1.7% | -2.6% | -1.2% |
| HU | 64 433 | 19 531 | 44 895 | 63 557 | 18 908 | 44 648 | -1.4% | -3.2% | -0.5% |
| IE | 59 778 | 14 179 | 45 580 | 57 563 | 13 278 | 44 271 | -3.7% | -6.4% | -2.9% |
| IT | 418 281 | 140 943 | 274 941 | 382 340 | 126 013 | 255 117 | -8.6% | -10.6% | -7.2% |
| LT | 20 368 | 6 067 | 14 299 | 20 034 | 6 138 | 13 895 | -1.6% | 1.2% | -2.8% |
| LU | 10 743 | 1 496 | 9 246 | 9 241 | 1 377 | 7 864 | -14.0% | -8.0% | -15.0% |
| LV | 11 145 | 2 493 | 8 650 | 10 466 | 2 022 | 8 442 | -6.1% | -18.9% | -2.4% |
| MT | 2 175 | 739 | 1 434 | 2 117 | 810 | 1 306 | -2.6% | 9.6% | -8.9% |
| NL | 180 740 | 83 744 | 96 965 | 164 509 | 74 114 | 90 380 | -9.0% | -11.5% | -6.8% |
| PL | 390 745 | 183 691 | 206 926 | 373 675 | 171 729 | 201 884 | -4.4% | -6.5% | -2.4% |
| PT | 63 626 | 21 603 | 41 527 | 58 238 | 18 734 | 39 284 | -8.5% | -13.3% | -5.4% |
| RO | 113 870 | 36 546 | 77 131 | 108 484 | 32 667 | 75 778 | -4.7% | -10.6% | -1.8% |
| SE | 50 920 | 18 771 | 31 680 | 47 435 | 16 425 | 30 810 | -6.8% | -12.5% | -2.7% |
| SI | 17 065 | 6 254 | 10 810 | 16 002 | 6 096 | 9 906 | -6.2% | -2.5% | -8.4% |
| SK | 39 994 | 19 904 | 20 088 | 37 689 | 18 170 | 19 518 | -5.8% | -8.7% | -2.8% |
| **EU27** | **3 610 052** | **1 385 235** | **2 209 468** | **3 316 739** | **1 224 245** | **2 084 822** | **-8.1%** | **-11.6%** | **-5.6%** |

**Note:** Only emissions from stationary installations are included in these ETS data hence emission from aviation is excluded.
**Source:** The EEA's ETC/CME, based on the 2021 Member States' GHG inventories submitted to UNFCCC for the years 1990-2019, proxy estimates for 2020 totals. ETS data is from EUTL (verified emissions for 2019 and 2020, not from the Member States proxies). Value for domestic aviation (which is used for calculation of ESD emissions) was obtained from Eurocontrol.

In total, emissions changed by -8.1 % within the EU between 2019 and 2020. Emissions decreased in the ETS sector and in the ESD sector but the decrease in the ESD sector (-5.6 %) is less significant than in the ETS sector (-11.6 %). Figure 2.11 illustrates all emission trend changes.

In absolute terms, the total emission decrease in the EU was -293 Mt $CO_2$ eq. Of this decrease -124 Mt $CO_2$ eq. occurred in the ESD sector and -161 Mt $CO_2$ eq. in the ETS sector.

At Member State level the trend change in emissions separated between ETS and ESD looks similar. ETS emissions increased in two Member States (Lithuania and Malta). The absolute increase was in both

countries similar (+0.07 Mt $CO_2$ eq.) Larger relative increase of ETS emissions was in Malta (+9.6 %) and in Lithuania (+1.2 %).
In 25 EU Member States ETS emissions decreased. The largest absolute decrease was experienced in Germany (−43 Mt $CO_2$ eq.) followed by Spain (−21 Mt $CO_2$ eq.) and Italy (−15 Mt $CO_2$ eq.). Estonia saw the highest relative ETS emission decrease (−33.8 %).

ESD emissions increased in two Member States (Bulgaria and Czechia). The largest absolute as well as relative increase can be observed in Czechia (+4 Mt $CO_2$ eq. or +5.8 %).

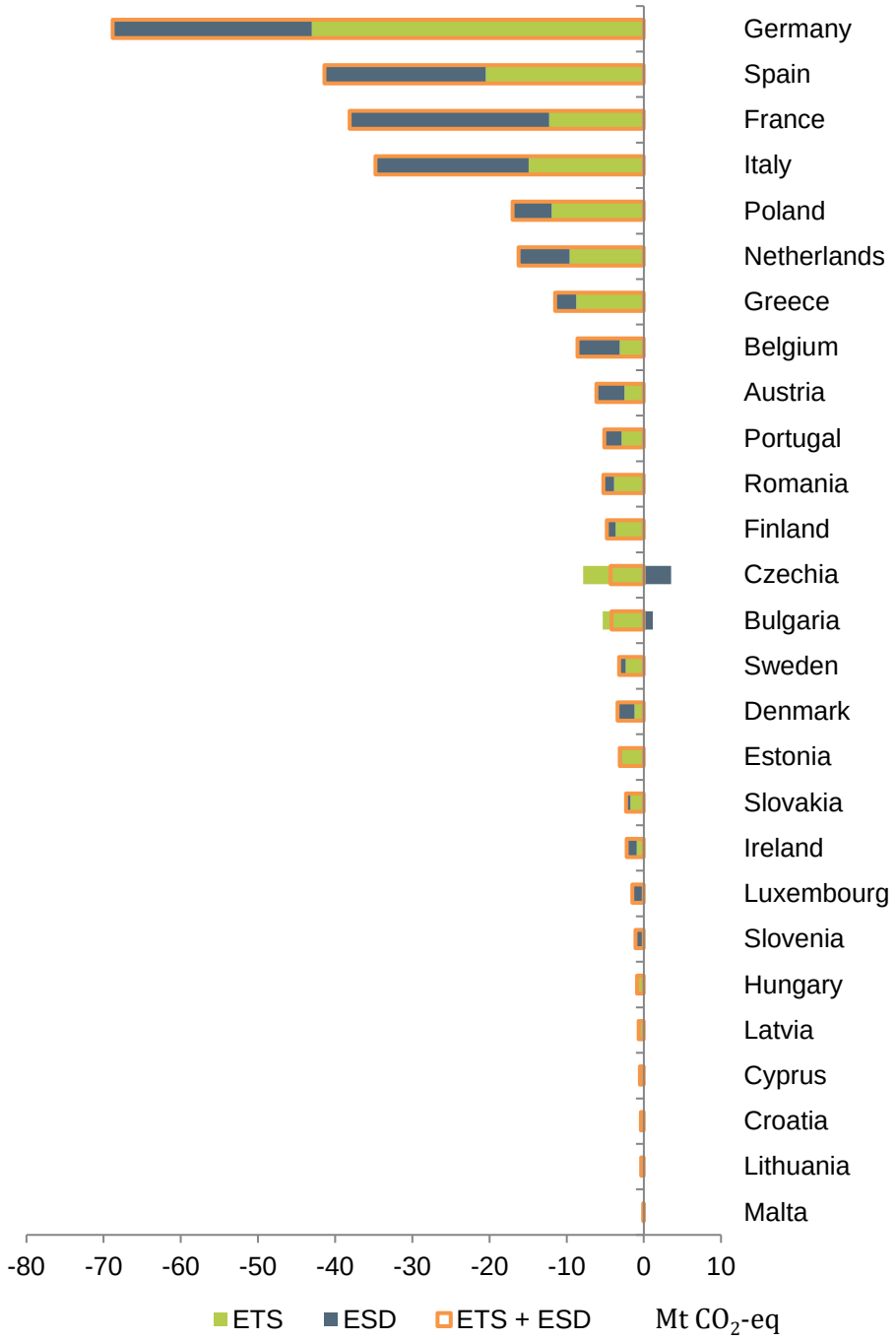
25 Member States saw decreases in ESD emissions. The largest absolute ESD emission declines were in France (−28 Mt $CO_2$ eq.) followed by Germany (−27 Mt $CO_2$ eq.), Spain (−23 Mt $CO_2$ eq.) and Italy (−21 Mt $CO_2$ eq.). The largest relative decrease of ESD emissions was in Luxembourg (−15 %).

Increases of both ETS and ESD emissions are not observed for any of the Member States. On the other hand, there are 23 Member States which had decreases in both ETS and ESD emissions.

In Bulgaria and Czechia emissions in the ETS sector decreased while emissions in the ESD sector increased. A contrasting development can be observed for Lithuania and Malta, where ETS emissions increased and ESD emissions decreased.

The emission trends both in the ETS and the ESD resemble the emission changes discussed in chapter 2.2.

**Figure 2.11 ETS and ESD emissions, change 2019-2020 (Mt $CO_2$ eq.)**



# 3 Performance of last year's EU proxy

National GHG inventories are required to fulfil certain principles as laid out in the UNFCCC reporting guidelines for GHG inventories: inventories must be transparent, consistent, comparable, complete and accurate (TCCCA). The IPCC Guidelines (IPCC, 2006) recommends Parties to perform QA/QC procedures that are important information to enable continuous improvement to inventory estimates. Through the quantification of deviations at the source level and for the inventory as a whole, improvements can be prioritized. Thus Parties may change methodologies in order to improve their greenhouse gas estimates at source level (e.g. moving from Tier 2 to Tier 3). Such methodological changes at Member States level cannot be captured in the calculation of the approximated GHG inventory for the EU. On-going quality improvements in Member States' inventories to take effect in next year's official submissions to UNFCCC are therefore a source of uncertainty for the EU proxy inventory.

This section compares the differences between the previous proxy estimates and the subsequent official inventory submissions.

Last year's proxy GHG estimates for 2019 overestimated the GHG emissions for the EU by 8.5 Mt $CO_2$ eq. or 0.2 %.

The effect of Member States' recalculations of GHG estimates and methodological improvements dominate the differences of the 2019 proxy emission estimates compared to 2019 emissions officially reported in 2021. After taking these recalculations into account difference between the proxy GHG inventory for 2019 and final GHG inventory submission was only 0.1 % for total emissions (including indirect $CO_2$, excluding LULUCF) for the EU.

## 3.1 Difference between MS proxy and final GHG inventories

The proxy submissions by Member States closely mirrored the slight decrease in official emissions as reported to the UNFCCC this year. The differences per Member State given in Table 3.1 arise from several factors: different methodologies and data with varying precision used across the Member States (resp. ETC/CME for gap-filling); the lack of updated (t-1) activity data for some key emission sources; and, from Member States' own recalculations of GHG estimates and methodological improvements which mainly cannot be reflected in the approximated data where usually constant methodologies and emission factors are assumed.

The largest deviations in relative terms occurred for Czechia (proxy 5.7 % higher), followed by Croatia (proxy 3.2 % higher) and Malta (proxy 2.4 % lower). In absolute terms the deviations were highest for France (overestimate by proxy of 9.3 Mt $CO_2$ eq.), Czechia (overestimate by proxy of 7.0 Mt $CO_2$ eq.), Germany (underestimate by 5.2 Mt $CO_2$ eq.) and the Netherlands (overestimate of proxy by 3.2 Mt $CO_2$ eq.). By comparing the percentage changes in emission levels 2018/2019 as derived from the 2020 proxy GHG inventory[6] on the one hand and from the 2021 official GHG inventory submissions to UNFCCC on the other, the deviations are in almost all cases in the same order of magnitude, see Figure 3.1. Also the direction of the emission trend (increasing or decreasing) was estimated correctly except for Belgium, Cyprus, Czechia, France, Lithuania and Malta. Cyprus, Lithuania and Malta had emission decreases estimated in its proxy while the emissions increased in the final inventory. For the other mentioned countries the emissions decreased, even though the proxy was estimating emission increases. Hungary's both the emission changes in the proxy and in the final inventory were quite small.

(6) The 2018 value used in this calculation comes from 2020 submission.

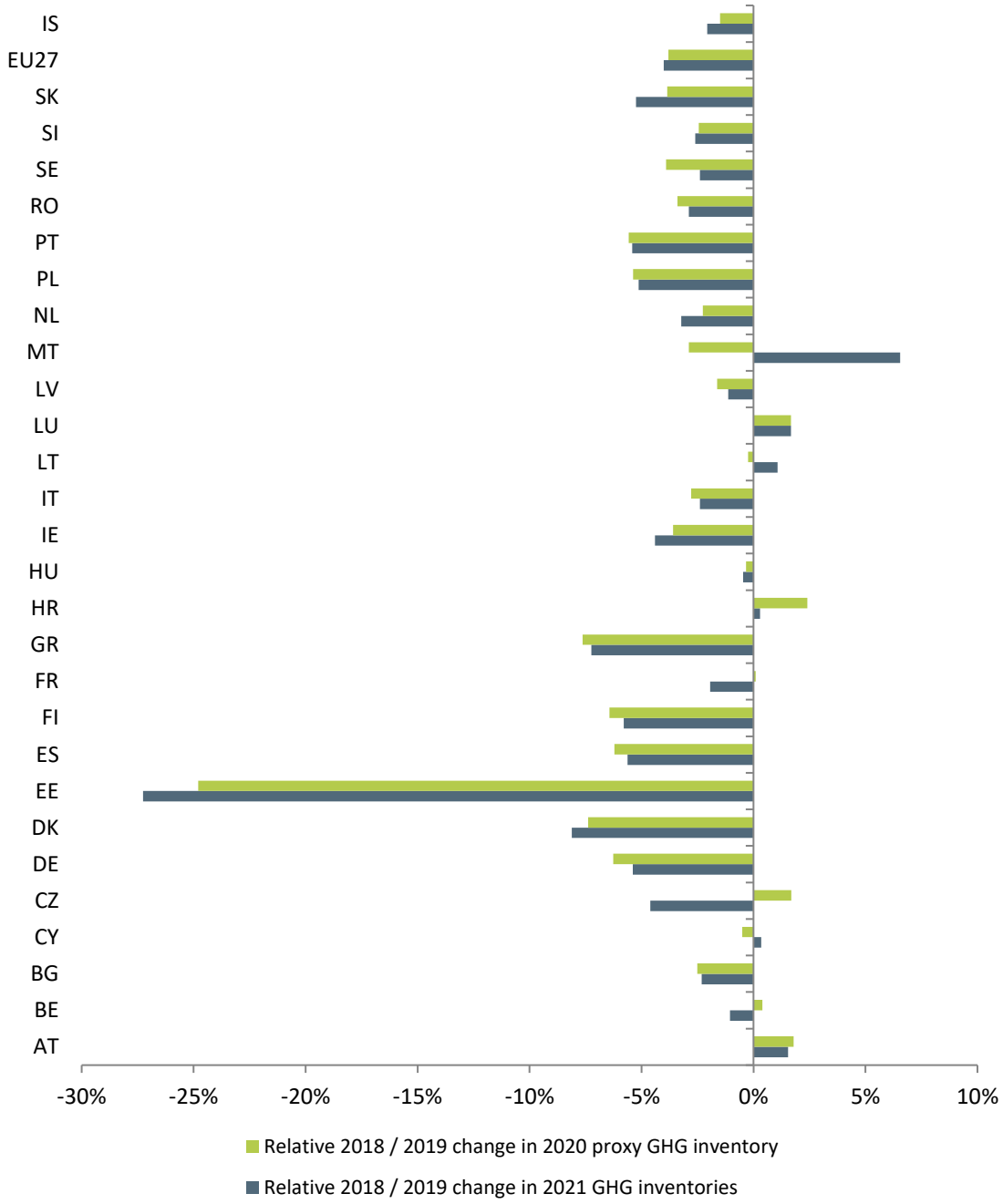
After taking into account recalculations, the relative differences were largest for Malta (-9.0 %), Czechia (+6.5 %), Estonia (+3.4 %) and France (+2.1 %).

**Table 3.1 Difference per Member State for year 2019 between proxy and final GHG inventories**

| MS | Inventory 2019 (Submission 2021) (kt $CO_2$ eq.) | Proxy 2019 (Submission 2020) (kt $CO_2$ eq.) | Deviation 2019 (kt $CO_2$ eq.) | Deviation 2019 (%) | Recalcu-lations (%) | Deviation 2019 cleared of impact of recalculations (%) | Proxy calculated by |
|---|---|---|---|---|---|---|---|
| **AT** | 79 842 | 80 361 | 519 | 0.7% | -0.4% | 0.2% | MS |
| **BE** | 116 651 | 118 927 | 2 276 | 2.0% | -0.5% | 1.5% | MS |
| **BG** | 55 955 | 56 367 | 412 | 0.7% | -0.9% | -0.2% | ETC/CME |
| **CY** | 8 842 | 8 767 | -74 | -0.8% | 0.0% | -0.8% | ETC/CME |
| **CZ** | 123 298 | 130 297 | 6 999 | 5.7% | 0.9% | 6.5% | MS |
| **DE** | 809 799 | 804 619 | -5 179 | -0.6% | -0.3% | -0.9% | MS |
| **DK** | 44 241 | 44 665 | 424 | 1.0% | -0.2% | 0.8% | MS |
| **EE** | 14 699 | 15 021 | 322 | 2.2% | 1.2% | 3.4% | MS |
| **ES** | 314 529 | 313 485 | -1 043 | -0.3% | -0.3% | -0.6% | MS |
| **FI** | 53 072 | 52 782 | -291 | -0.5% | -0.1% | -0.7% | MS |
| **FR** | 435 999 | 445 274 | 9 275 | 2.1% | -0.1% | 2.1% | MS |
| **GR** | 85 631 | 85 185 | -446 | -0.5% | 0.1% | -0.4% | MS |
| **HR** | 23 605 | 24 365 | 759 | 3.2% | -1.1% | 2.1% | MS |
| **HU** | 64 433 | 63 011 | -1 422 | -2.2% | 2.4% | 0.2% | MS |
| **IE** | 59 778 | 58 745 | -1 033 | -1.7% | 2.6% | 0.9% | MS |
| **IT** | 418 281 | 415 622 | -2 658 | -0.6% | 0.2% | -0.4% | MS |
| **LT** | 20 368 | 20 219 | -149 | -0.7% | -0.6% | -1.3% | MS |
| **LU** | 10 743 | 10 724 | -19 | -0.2% | 0.2% | 0.0% | MS |
| **LV** | 11 145 | 11 537 | 393 | 3.5% | -3.9% | -0.4% | MS |
| **MT** | 2 175 | 2 123 | -52 | -2.4% | -6.6% | -9.0% | MS |
| **NL** | 180 740 | 183 938 | 3 198 | 1.8% | -0.8% | 1.0% | MS |
| **PL** | 390 745 | 390 671 | -74 | 0.0% | -0.2% | -0.3% | MS |
| **PT** | 63 626 | 63 661 | 34 | 0.1% | -0.2% | -0.2% | MS |
| **RO** | 111 767 | 112 168 | 401 | 0.4% | -0.9% | -0.5% | MS |
| **SE** | 50 920 | 49 756 | -1 164 | -2.3% | 0.8% | -1.5% | MS |
| **SI** | 17 065 | 17 074 | 9 | 0.1% | 0.1% | 0.2% | MS |
| **SK** | 39 948 | 41 681 | 1 733 | 4.3% | -2.7% | 1.6% | MS |
| **EU27** | **3 607 896** | **3 616 426** | **8 531** | **0.2%** | **-0.1%** | **0.1%** | **ETC/CME** |

**Source:** Member States submissions to UNFCCC and proxy estimates for 2019.

**Figure 3.1** **Relative difference between proxy and submitted inventories by Member State 2018/2019**




**Source:** Member States submissions to UNFCCC and proxy estimates for 2019.

## 3.2 Sectoral differences between proxy and final GHG inventories

At the sectoral level, the largest difference between the proxy and the final GHG inventory in absolute terms was in 1.A.4 Other sectors [Energy] (+10.5 Mt $CO_2$ eq.) and 2.C Metal production [IPPU] (-8.0 Mt $CO_2$ eq.). The next largest differences were in 1.A.3 Transport [Energy] (-3.9 Mt $CO_2$ eq.) and 3.A Enteric fermentation [Agriculture] (+3.8 Mt $CO_2$ eq.). After accounting for recalculation effects, the differences for most of these sectors are significantly smaller. Sectors with highest relative deviation after allowing

for recalculation effects were 3.I Other carbon-containing fertilizers [Agriculture] (+123.1 %), 2.H Other [IPPU] (-24.7 %), 5.E Other [Waste] (+17.8 %), 3.B Manure management [Agriculture] (+17.1%) and 3.A Enteric fermentation [Agriculture] (+16.9 %), see Table 3.2. Therefore largest relative deviations occur mainly in "other" categories which are compound items and usually comparatively low in absolute emission levels.

Changes in the data reported as proxy in last year and as final in 2021 submissions under the UNFCCC are mostly affected by the sources of the activity data. The data available during preparation of the proxy inventory for the Energy sector are based on preliminary data and energy balances provided by the statistical offices. For the inventory submitted in 2021 however, final energy balances were used. In case of the IPPU sector, data for the year X-1 is not usually available when preparing the approximated inventories, thus extrapolation and interpolation of the activity data are mostly used. In Agriculture and Waste there is usually the case that activity data are partly available (for instance population data), however statistical methods are also partly applied to estimate the proxy inventory.

In the Energy sector, deviations after recalculation are very small. They are highest for 1.A.5 Other (-2.3 %) and for 1.B Fugitive emissions (+2.1 %). In IPPU, there were considerable recalculations for some subsectors. The largest relative deviations occurred in 2.H Other (-20.9 %). The largest absolute difference was in subsector 2.C Metal production (-8.0 Mt $CO_2$ eq. or -9.9 %) followed by 2.F Product uses as ODS substitutes (+3.4 Mt $CO_2$ eq. resp. +3.6 %). After taking into account the recalculations effect, the deviation increases for the 2.H Other up to -24.7 % while for 2.C Metal production decreases significantly down to +0.4 % and for 2.F Product uses as ODS substitutes decreases down to +3.2 %. For the IPPU sector overall after allowing for recalculations the deviation is 0.9 %.

The agricultural sector has a relative small deviation (+0.8 %) before allowing for recalculation and large deviation (+9.9 %) after allowing for recalculations. The largest absolute deviations were in 3.A Enteric fermentation (+3.8 Mt $CO_2$ eq. resp. +2.0 %). After considering recalculation effects the deviation for 3.A Enteric fermentation deviation increases up to +16.9 %. This fact may indicate that most of the recalculations in Agriculture was already considered when approximated inventories were created.

After taking the recalculations effect into consideration, the deviation for the waste sector still indicates, that emissions in the waste sector were underestimated by 3.2 %. The largest absolute deviation was found in subsector 5.A Solid waste disposal (-3.4 Mt $CO_2$ eq. or -3.5 %). The emission of this category dominate the total waste sector emissions and even after considering recalculations the deviation of 5.A emissions were still underestimated (-4.8 %). The deviations of all other waste subsectors are less than +/- 1.2 Mt $CO_2$ eq.

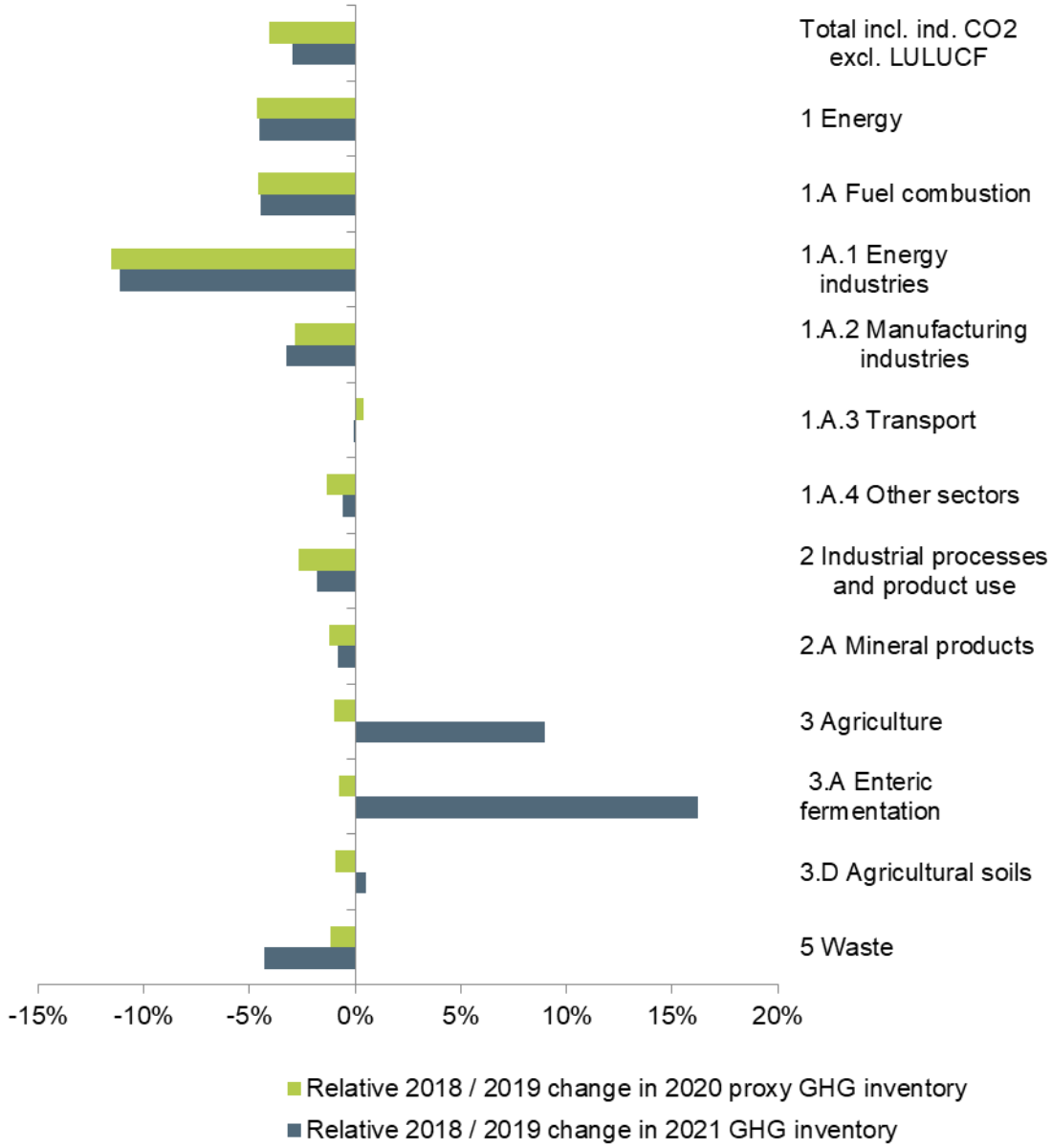
The differences for estimates for indirect $CO_2$ are quite significant (-3.2 % before and +1.2 % after considering recalculation effects). However the absolute amounts of indirect $CO_2$ emissions have only a very small share in total EU emissions.

By comparing the percentage changes in emission levels 2018/2019 as derived from the 2020 proxy GHG inventory on the one hand and from the 2021 official GHG inventory submissions to UNFCCC on the other by sectors, the differences are visible the most for Agriculture, see Figure 3.2.

**Table 3.2 Difference per sector for year 2019 between proxy and final GHG inventories.**

| Sector | Inventory 2019 (Submission 2021) (kt $CO_2$ eq.) | Proxy 2019 (Submission 2020) (kt $CO_2$ eq.) | Deviation 2019 (kt $CO_2$ eq.) | Deviation 2019 (%) | Recalcu-lations (%) | Deviation 2019 cleared of impact of recalculations (%) |
|---|---|---|---|---|---|---|
| **Total incl. indirect $CO_2$ excl. LULUCF** | **4 059 228** | **4 068 155** | **8 927** | **0.2%** | **0.9%** | **1.1%** |
| **1 Energy** | **3 129 471** | **3 135 180** | **5 710** | **0.2%** | **0.0%** | **0.1%** |
| 1.A Fuel combustion | 3 053 353 | 3 056 740 | 3 387 | 0.1% | 0.0% | 0.1% |
| 1.A.1 Energy industries | 986 870 | 987 373 | 503 | 0.1% | 0.4% | 0.5% |
| 1.A.2 Manufacturing industries | 485 927 | 484 527 | -1 400 | -0.3% | -0.2% | -0.4% |
| 1.A.3 Transport | 955 730 | 951 792 | -3 938 | -0.4% | 0.0% | -0.4% |
| 1.A.4 Other sectors | 616 419 | 626 900 | 10 480 | 1.7% | -1.0% | 0.7% |
| 1.A.5 Other | 8 406 | 6 148 | -2 258 | -26.9% | 24.5% | -2.3% |
| 1.B Fugitive emissions | 76 117 | 78 440 | 2 323 | 3.1% | -1.0% | 2.1% |
| **2 Industrial processes & product use** | **369 791** | **367 329** | **-2 462** | **-0.7%** | **1.6%** | **0.9%** |
| 2.A Mineral products | 110 986 | 111 249 | 263 | 0.2% | 0.2% | 0.4% |
| 2.B Chemical industry | 62 126 | 63 752 | 1 626 | 2.6% | -1.9% | 0.7% |
| 2.C Metal production | 80 881 | 72 867 | -8 014 | -9.9% | 10.3% | 0.4% |
| 2.D Non-energy products | 9 038 | 9 582 | 544 | 6.0% | -4.3% | 1.7% |
| 2.E Electronic Industry | 838 | 833 | -5 | -0.6% | 0.3% | -0.3% |
| 2.F Product uses as ODS substitutes | 93 934 | 97 288 | 3 354 | 3.6% | -0.3% | 3.2% |
| 2.G Other product manufacture and use | 11 608 | 11 457 | -151 | -1.3% | -0.9% | -2.2% |
| 2.H Other | 381 | 301 | -80 | -20.9% | -3.8% | -24.7% |
| **3 Agriculture** | **428 221** | **431 573** | **3 352** | **0.8%** | **9.2%** | **9.9%** |
| 3.A Enteric fermentation | 185 601 | 189 354 | 3 754 | 2.0% | 14.8% | 16.9% |
| 3.B Manure management | 62 505 | 63 056 | 551 | 0.9% | 16.2% | 17.1% |
| 3.C Rice cultivation | 2 489 | 2 540 | 50 | 2.0% | -1.7% | 0.3% |
| 3.D Agricultural soils | 164 404 | 164 101 | -303 | -0.2% | 1.6% | 1.5% |
| 3.F Field burning of agricultural residues | 0 | 0 | 0 | NA | NA | NA |
| 3.G Liming | 659 | 679 | 20 | 3.1% | -3.8% | -0.7% |
| 3.H Urea application | 6 159 | 5 831 | -327 | -5.3% | 0.4% | -4.9% |
| 3.I Other carbon-containing fertilizers | 4 156 | 4 116 | -40 | -1.0% | 4.5% | 3.6% |
| 3.J Other | 676 | 288 | -387 | -57.3% | 180.4% | 123.1% |
| **5 Waste** | **1 573** | **1 607** | **34** | **2.2%** | **-1.9%** | **0.2%** |
| 5.A Solid waste disposal | 134 834 | 132 491 | -2 343 | -1.7% | -1.5% | -3.2% |
| 5.B Biological treatment of solid waste | 96 871 | 93 482 | -3 389 | -3.5% | -1.3% | -4.8% |
| 5.C Incineration & open burning of waste | 8 380 | 8 361 | -20 | -0.2% | 0.5% | 0.2% |
| 5.D Waste water treatment & discharge | 3 927 | 3 844 | -83 | -2.1% | 3.2% | 1.1% |
| 5.E Other | 25 593 | 26 712 | 1 118 | 4.4% | -3.2% | 1.2% |
| **Indirect $CO_2$** | **1 634** | **1 582** | **-52** | **-3.2%** | **4.3%** | **1.2%** |

**Figure 3.2 Relative difference between proxy and submitted inventories by sector 2018/2019**




**Source:** Member States submissions to UNFCCC and proxy estimates for 2019.
**Note:** Only sectors with GHG emissions of more than 100 Mt $CO_2$ eq. in 2019 are shown.

# 4 Methodologies and data sources at Member State level

## 4.1 Description of different approaches

This report presents the estimated GHG emissions for 2020 based on Member State emissions estimates, submitted to EEA by 31 July. The aggregated EU proxy GHG emission estimates are based on these submissions and gap filling where necessary.

Under the Regulation (EU) 2018/1999 which replaces Regulation (EU) 525/2013 on the mechanism for monitoring and reporting GHG emissions (EU MMR) and its implementing provisions, Member States submit, where possible, to the European Commission approximated GHG inventories by 31 July every year for the preceding year t–1. Where a Member State has not submitted a 'proxy' inventory, the EEA uses its own estimates for gap-filling purposes in order to have a complete approximated GHG inventory at EU level.

In previous years the EEA and its ETC/CME developed and used the latest activity data available at country level to estimate the emissions. For emission sources for which no appropriate data sets exist, emissions were extrapolated from past trends, or emissions from the previous year are kept constant where historic data do not show a clear linear trend. That methodology which estimated emissions using a 'bottom-up' approach was complex and time-consuming. This year, submission of approximated greenhouse gas inventory was only missing from Bulgaria, which have a share less than 2 % of the emissions of the whole EU. Previous year gap-filling for Bulgaria, which was done by a more simplified approach, had 0.7% deviation between the 2019 proxy and final GHG inventory of Bulgaria. Deviation cleared of recalculations impact was only -0.2%, the 2$^{nd}$ closest of all the EU MS submissions. Therefore Bulgaria was gap-filled this year by ETC/CME for EEA again with a more simplified approach.

In some cases it has been necessary to allocate or distribute the reported emissions to sectors or within sub-sectors. This is done to allow for the aggregation and explanation of trends at EU level. Details are given in section 4.4.

## 4.2 MS proxies submitted

Member States are responsible for the methodological choice regarding their own estimates. The MS should submit approximated GHG inventories for the preceding year (*t*–1) in accordance with the Summary2 table of the Common Reporting Format (CRF). The implementing regulation of the EU MMR requires the calculation at a level of disaggregation of source categories reflecting the activity data and methods available for the preparation of the proxy estimates. Therefore, it is in line with the MMR if Member States submit only partially complete aggregated Summary2 tables with their proxy estimates. Additionally Member States should split emissions – where available – into ETS and non-ETS emissions and shall provide information on drivers and trends for *t*–1.

## 4.3 Gap-filling for MS not submitting a proxy inventory

This year, estimates by the EEA and ETC/CME are made only for the major source categories; the energy and IPPU sectors. Relevant data sources with updated activity or emissions data for the year *t*-1 were identified and used to calculate emissions. For source categories for which no international data sets with updated activity data exist or which are too complex for a simple approach, emissions from the previous year were kept constant. On this basis, a simple approach was developed covering the full scope of emissions included in a GHG inventory submission.

The EEA estimates are based on publicly available data sets at the European level. For the estimation of approximated emissions, the following data sources for emissions or activities were used:

- Verified emissions reported under the EU-ETS and recorded in the EUTL[7];
- The percentage change in the ENEF proxy PEC value between 2020 and 2019. (EEA, 2021c)

The driver percentage from the ENEF proxy PEC is based on Eurostat monthly data. The ENEF proxy is prepared for the EEA by ETC/CME (EEA, 2021c).

Based on these data sources, emission estimates for year 2020 were made for the following source categories:

- 1. Energy
  - 1.A Fuel Combustion
    - 1.A.1 Energy Industries
    - 1.A.2 Manufacturing Industries and Construction
    - 1.A.3 Transport
    - 1.A.4 Other sectors
    - 1.A.5 Other
  - 1.B Fugitive emissions from fuels
    - 1. Solid fuels
    - 2. Oil and natural gas
- 2. Industrial Processes and Product Use
  - 2.A Mineral Industry
  - 2.C Metal Production

Additionally, flight and emissions data from Eurocontrol was used to gap-fill international aviation emissions for those Member States that did not provide an estimate.

All other source categories were filled by using previous year emissions.

The timing of these calculations depends on the release of the underlying data sources. The availability of data sources (including the MS GHG inventories) is shown in Table 4.1.

**Table 4.1 Time of availability of data used for the proxy inventory**

| Data source | Availability |
|---|---|
| EUTL verified emissions | Data as of 25 August 2020 was used |
| Eurostat monthly data | mid July |
| GHG inventory data from CRF files (via UNFCCC) | early June |
| Eurocontrol flight and emissions data | Early September |

**Source:** ETC/CME

(7) European Union Emissions Trading System data viewer, 11 August 2021 https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

National GHG inventories are required to fulfil certain principles as laid out in the UNFCCC reporting guidelines for GHG inventories: inventories must be transparent, consistent, comparable, complete and accurate (TCCCA). The IPCC Good Practice Guidance recommends Parties to perform QA/QC procedures that are important information to enable continuous improvement to inventory estimates. Through the quantification of uncertainty at the source level and for the inventory as a whole, improvements can be prioritised. Thus Parties may change methodologies in order to improve their greenhouse gas estimates at source level (e.g. moving from Tier 2 to Tier 3). Such methodological changes at Member States level cannot be captured in the calculation of the approximated GHG inventory for the EU. On-going quality improvements in Member States' inventories to take effect in next year's official submissions to UNFCCC are therefore a source of uncertainty for the proxy inventory.

It has to be taken into account that any recent national improvements of GHG reporting methodologies could not be considered for approximated GHG inventories calculated centrally by EEA and its ETC/CME, as the 2021 estimates for the 2020 proxy inventory were based on the national methodologies used for 2021 inventory submissions (covering emissions until 2019). Thus, revised methodologies and parameters at Member States level can result in differences between the final inventory and the proxy inventory.

### *4.3.1 $CO_2$ emissions from 1. Energy subsectors*

For the proxy year estimation, the previous year $CO_2$ value from each 1.Energy subsector from summary table 2 was multiplied by the percentage change of $CO_2$ emissions from energy use between the proxy year and the previous year.

$$E_{1,GHG}^{Y-1} = E_{1,GHG}^{Y-2} \cdot \left( \frac{E_{1,GHG}^{Y-1}}{E_{1,GHG}^{Y-2}} \% \right)$$

| | |
|---|---|
| $E_{1,GHG}^{Y-1}$ | Emission of $CO_2$ in source category 1. sub sector in the proxy year |
| $E_{1,GHG}^{Y-2}$ | Emission of $CO_2$ in source category 1. sub sector in the previous year |
| $\frac{E_{1,GHG}^{Y-1}}{E_{1,GHG}^{Y-2}} \%$ | Change in the ENEF proxy PEC between the previous year and the proxy year. The PEC driver is based on Eurostat monthly data. (EEA, 2021c) |

### *4.3.2 IPPU emissions from mineral and metal industries*

To estimate $CO_2$ emissions from 2.A Mineral industry and $CO_2$, $CH_4$ and $N_2O$ emissions from 2.C Metal industry, the following calculation was performed.

$$E_{2A/2C,\mathrm{GHG}}^{Y-1} = \frac{E_{ETS,Activities}^{Y-1}}{E_{ETS,Activities}^{Y-2}} \cdot E_{2A/2C,GHG}^{Y-2}$$

| | |
|---|---|
| $E_{2A/2C,GHG}^{Y-1}$ | Emission of $CO_2$, $CH_4$ or $N_2O$ in source category 2.A or 2.C in the proxy year |
| $E_{ETS,Activities}^{Y-1}$ | ETS emissions for some activities in the proxy year |
| $E_{ETS,Activities}^{Y-2}$ | ETS emissions for some activities in the previous year |
| $E_{2A/2C,GHG}^{Y-2}$ | Emission of $CO_2$, $CH_4$ or $N_2O$ in source category 2.A or 2.C in the previous year |

ETS emission data from the European Transaction Log (EUTL) was used. The following table shows the ETS activities that were aggregated for the calculation.

**Table 4.2 ETS activities used for the emission estimates**

| Mineral industry | Metal industry |
|---|---|
| 29 Production of cement clinker | 23 Metal ore roasting or sintering |
| 30 Production of lime, or calcination of dolomite/magnesite | 24 Production of pig iron or steel |
| 31 Manufacture of glass | 25 Production or processing of ferrous metals |
| 32 Manufacture of ceramics | 26 Production of primary aluminium |
| 33 Manufacture of mineral wool | 27 Production of secondary aluminium |
| 34 Production or processing of gypsum or plasterboard | 28 Production or processing of non-ferrous metals |

### *4.3.3 Other emissions*

For the source categories not mentioned before the emission values from previous year (2019) were used as proxy estimates for the year 2020. Also for all emissions of fluorinated greenhouse gases (HFCs, PFCs, $SF_6$, $NF_3$) previous year values were used as proxy estimates.

## 4.4 Methodology for gap-filling of partially complete proxy submissions

The approximated GHG emissions data are submitted by Member States in a form consistent with CRF Summary2 tables. However, these tables are not always submitted with complete sub-sector level disaggregation. Because EU emissions are the sum of the Member States' emissions, in order to achieve a complete EU proxy inventory, some gap filling has been required. For some MS proxies the reported emissions have been allocated or distributed within sub-sectors. This is done to allow for the aggregation and explanation of trends at EU level. Allocations were needed for Germany and Sweden. In some cases the amendments involved simply including subtotals or totals - for Portugal this amendment was necessary.

### *4.4.1 Total $CO_2$ eq., including indirect $CO_2$, without LULUCF in ETS and non-ETS*

Most Member States did report *Total $CO_2$ equivalent emissions, without LULUCF*. There has however been some ambiguity about how to report included indirect $CO_2$ emissions. In previous years, a total was included in cell J68 whether or not the total included indirect $CO_2$ emissions. Many MS leave this cell blank even if they do report indirect $CO_2$ emissions. For consistency this calculation has been adjusted (J68 =SUM J66,B65), in all proxy sheets so that there is a total shown in cell J68 whether or not the MS has calculated any indirect $CO_2$ emissions.

Most Member States provided a split of ETS and non-ETS emissions in their submissions.

### 4.4.2 F-gases

Emissions from fluorinated greenhouse gases (F-gases[8]) can appear in the following source categories of industrial processes and product use:

- 2.B Chemical industry
- 2.C Metal industry
- 2.E Electronic industry
- 2.F Product uses as ODS substitutes
- 2.G Other product manufacture and use
- 2.H Other

Germany and Sweden reported F-gas emissions but did not disaggregate into source categories. Reported F-gas emissions were allocated using the shares of F-gas emissions per source categories of the latest available GHG inventories.

The gap-filling approach used for Bulgaria (described in section 4.3), calculates proxy estimates for whole of the IPPU sector. For Bulgaria, the F-gas emissions were distributed in the same way as for Germany and Sweden using allocations derived from reports for the previous year.

### 4.4.3 Gap-filling LULUCF

Data from Member States' 2021 projections was applied to gap-fill LULUCF. Gap-filling was done for six Member States; Denmark, Estonia, Croatia, Hungary, Latvia and Slovenia.

Cyprus reported LULUCF but did not disaggregate emissions and removals into source categories. Reported LULUCF emissions and removals were allocated using the shares of LULUCF emissions and removals per source categories of the latest available GHG inventory.

### 4.4.4 Gap-filling aviation data

Gap-filling of aviation data was done by applying Eurocontrol data. International aviation was gap-filled for Denmark, Luxembourg, Portugal and Slovenia. Domestic aviation was gap-filled for all Member States except Estonia, Finland and Luxembourg. Eurocontrol aviation data is divided into three parts; international aviation, domestic aviation and to other aviation, when Eurocontrol has been uncertain where to allocate the data. Proxy domestic aviation contains the other aviation data. Domestic aviation data has an effect on total ESD value.

### 4.4.5 Sweden

In the submission, not all sectors were fully disaggregated into corresponding categories. To gap-fill these categories, emissions were allocated against relevant gases and subsectors based on the subsector to sector ratios of Sweden's 2019 inventory Summary2 table. This approach was used for 1.A.B Fugitive emissions from fuels, most of the IPPU sector, liming and urea application, and whole Waste sector.

The level of detail provided reflects the uncertainties of the estimates, given the limited data availability and differences in the methods used compared to the reported inventory, in line with Commission Implementing Regulation 749/2014, Article 17.1a.

(8) F-gas emissions include emission of the following gases or groups of gases: hydrofluorocarbons = HFCs; perfluorocarbons = PFCs; sulphur hexafluoride = $SF_6$; nitrogen trifluoride =$NF_3$.

# 5 References


BP 2021, BP Statistical Review of World Energy 2021. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2020-full-report.pdf

Copernicus 2021, Climate in 2020. https://climate.copernicus.eu/press-releases?q=press-releases&page=2

EEA 2021a, *Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021.* https://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2020

Eurostat Early estimates, 2021. https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_balances_-_early_estimates

EU 2018, Regulation (EU) 2018/842. Binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013

European Union Emissions Trading System data viewer, 11 August 2021. https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

EEA 2021b, the approximated Renewable energy shares estimates 2021, for the EEA by ETC/CME.

Eurostat 2021, Supply, transformation, consumption – commodity balances – monthly data. https://ec.europa.eu/eurostat/data/database

IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories. www.ipcc-nggip.iges.or.jp/public/2006gl/

EEA 2021c, the approximated energy efficiency estimates 2021, for the EEA by ETC/CME.

## Annex 1: Detailed results for each Member State

| Country | Compiled by | Submission date |
|---|---|---|
| Austria | Member State | 29 July 2021 |
| Belgium | Member State | 30 July 2021 |
| Bulgaria | EEA, ETC/CME | |
| Cyprus | Member State | 24 July 2021 |
| Czechia | Member State | 22 July 2021 |
| Germany | Member State | 01 July 2021 |
| Denmark | Member State | 16 July 2021 |
| Estonia | Member State | 26 July 2021 |
| Spain | Member State | 05 July 2021 |
| Finland | Member State | 17 June 2021 |
| France | Member State | 29 July 2021 |
| Greece | Member State | 16 July 2021 |
| Croatia | Member State | 26 July 2021 |
| Hungary | Member State | 31 July 2021 |
| Ireland | Member State | 12 July 2021 |
| Italy | Member State | 30 July 2021 |
| Lithuania | Member State | 02 August 2021 |
| Luxembourg | Member State | 30 July 2021 |
| Latvia | Member State | 20 July 2021 |
| Malta | Member State | 29 July 2021 |
| Netherlands | Member State | 28 July 2021 |
| Poland | Member State | 20 July 2021 |
| Portugal | Member State | 23 July 2021 |
| Romania | Member State | 13 August 2021 |
| Sweden | Member State | 14 July 2021 |
| Slovenia | Member State | 26 July 2021 |
| Slovakia | Member State | 13 July 2021 |
| **European Union (EU27)** | **EEA, ETC/CME** | |
| Iceland | Country | 02 July 2021 |
| Switzerland | Country | 13 July 2021 |
| Norway | Country | 29 July 2021 |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Austria
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 61 981,07 | 6 111,34 | 3 398,79 | 1 694,46 | 29,89 | 434,04 | NO | 12,04 | 73 661,64 | 27 034,15 | 46 627,49 |
| **1. Energy** | 48 666,96 | 554,60 | 602,82 | | | | | | 49 824,38 | **14 044,50** | **35 779,88** |
| A. Fuel combustion (sectoral approach) | 48 548,71 | 326,09 | 602,82 | | | | | | 49 477,62 | 14 044,50 | **35 433,12** |
| 1. Energy industries | 8 753,76 | 24,67 | 97,13 | | | | | | 8 875,56 | 7 336,58 | **1 538,99** |
| 2. Manufacturing industries and construction | 10 433,52 | 19,47 | 123,27 | | | | | | 10 576,26 | 6 232,62 | **4 343,64** |
| 3. Transport | 20 749,48 | 18,06 | 231,83 | | | | | | 20 999,38 | 475,30 | **20 524,08** |
| 4. Other sectors | 8 560,59 | 263,85 | 149,60 | | | | | | 8 974,03 | NO | **8 974,03** |
| 5. Other | 51,35 | 0,04 | 0,99 | | | | | | 52,39 | NO | **52,39** |
| B. Fugitive emissions from fuels | 118,25 | 228,51 | NO | | | | | | 346,76 | NO | **346,76** |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | NO | |
| 2. Oil and natural gas | 118,25 | 228,51 | NO | | | | | | 346,76 | NO | **346,76** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 13 172,33 | 46,59 | 91,82 | 1 694,46 | 29,89 | 434,04 | NO | 12,04 | 15 481,17 | **12 989,65** | **2 491,53** |
| A. Mineral industry | 2 820,00 | | | | | | | | 2 820,00 | 2 820,00 | |
| B. Chemical industry | 687,30 | 46,59 | 52,01 | NA | NA | NA | NA | NA | 785,89 | 650,25 | **135,65** |
| C. Metal industry | 9 519,40 | NO | NO | NO | NO | NO | NO | NO | 9 519,40 | 9 519,40 | |
| D. Non-energy products from fuels and solvent use | 145,63 | NA | NA | | | | | | 145,63 | NO | **145,63** |
| E. Electronic Industry | | | | 3,08 | 29,89 | 12,93 | NA | 12,04 | 57,94 | NO | **57,94** |
| F. Product uses as ODS substitutes | | | | 1 691,39 | NO | NO | NO | NO | 1 691,39 | NO | **1 691,39** |
| G. Other product manufacture and use | NO | NO | 39,81 | NO | NO | 421,12 | NO | NO | 460,93 | NO | **460,93** |
| H. Other | NA | NA | NA | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 139,73 | 4 578,30 | 2 437,00 | | | | | | 7 155,02 | **NO** | **7 155,02** |
| A. Enteric fermentation | | 4 040,67 | | | | | | | 4 040,67 | **NO** | **4 040,67** |
| B. Manure management | | 537,14 | 433,45 | | | | | | 970,59 | **NO** | **970,59** |
| C. Rice cultivation | | NO | | | | | | | NO | **NO** | |
| D. Agricultural soils | | NA | 2 003,47 | | | | | | 2 003,47 | **NO** | **2 003,47** |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | **NO** | |
| F. Field burning of agricultural residues | | 0,50 | 0,07 | | | | | | 0,57 | **NO** | **0,57** |
| G. Liming | 98,11 | | | | | | | | 98,11 | **NO** | **98,11** |
| H. Urea application | 17,00 | | | | | | | | 17,00 | **NO** | **17,00** |
| I. Other carbon-containing fertilizers | 24,61 | | | | | | | | 24,61 | **NO** | **24,61** |
| J. Other | NA | NA | NA | | | | | | NA | **NO** | |
| **4. Land use, land-use change and forestry[1]** | -4 788,48 | 23,88 | 128,29 | | | | | | -4 636,31 | | |
| A. Forest land | -4 324,68 | 0,10 | 25,78 | | | | | | -4 298,80 | | |
| B. Cropland | 124,79 | NO | 23,38 | | | | | | 148,17 | | |
| C. Grassland | 286,77 | 23,79 | NO | | | | | | 310,56 | | |
| D. Wetlands | 59,58 | NO | NO | | | | | | 59,58 | | |
| E. Settlements | 307,17 | NO | 59,31 | | | | | | 366,48 | | |
| F. Other land | 238,99 | NO | 6,73 | | | | | | 245,73 | | |
| G. Harvested wood products | -1 481,11 | | | | | | | | -1 481,11 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 2,06 | 931,85 | 267,15 | | | | | | 1 201,06 | **NO** | **1 201,06** |
| A. Solid waste disposal | NO | 830,93 | | | | | | | 830,93 | **NO** | **830,93** |
| B. Biological treatment of solid waste | | 78,23 | 97,75 | | | | | | 175,97 | **NO** | **175,97** |
| C. Incineration and open burning of waste | 2,06 | 0,00 | 0,01 | | | | | | 2,07 | **NO** | **2,07** |
| D. Waste water treatment and discharge | | 22,70 | 169,39 | | | | | | 192,09 | **NO** | **192,09** |
| E. Other | NO | NO | NO | | | | | | NO | **NO** | |
| **6. Other** *(as specified in summary 1.A)* | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 893,26 | 0,47 | 27,73 | | | | | | 921,46 | | |
| Aviation | 847,89 | 0,44 | 23,84 | | | | | | 872,18 | | |
| Navigation | 45,37 | 0,02 | 3,89 | | | | | | 49,28 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 73 661,64 | 27 034,15 | 46 627,49 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 69 025,32 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

[1] For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
[2] See footnote 7 to table Summary 1.A.
[3] In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
[4] Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| The trend of 1.A fuel combustion widely follows the trend in preliminary energy statistics<br>(http://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/energiebilanzen/index.html)<br>The most significant trends 2019-2020 in fuel consumption by type of fuel are:<br>Transport diesel sales decreased by 13% and gasoline sales decreased by 17% (approx. -3.4 Mt of CO2 from diesel and gasoline).<br>Gasoil consumption decreased by 2% (approx. -0.1 Mt of CO2)<br>Natural gas consumption (other than non energy use) decreased by 4% (approx. -0.7 Mt of CO2)<br>(http://www.e-control.at/de/statistik/gas)<br>CO2 from coal power plants decreased by 69% (-0.8 Mt)<br>Industrial processes:<br>CO2 emissions from iron and steel industries (1.A.2.a and 2.C.1) decreased by 7% (approx -0.9 Mt CO2) due to an decrease in crude steel production (-10%).<br>(https://www.worldsteel.org/steel-by-topic/statistics.html)<br>International bunkers:<br>Kerosin consumption decreased by 66% (-2.1 Mt CO2)<br>Agriculture: Fertilizer Use: two-year mean value increased by 1.2% (https://www.ama.at/Marktinformationen/Getreide-und-Olsaaten/Dungemittel)<br>Animals numbers: total cattle decreased by 1.3%; milk cows increased by 0.1 % while milk yield increased by +1.5%; swine number increased by 1.2%<br>(https://www.ama.at/Marktinformationen/Vieh-und-Fleisch/Produktion;<br>https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/viehbestand_tierische_erzeugung/viehbestand/index.html) |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS** (Sheet 1 of 1)

Year: 2020
Submission: 2021
Country: Belgium
Geographical scope[4]:

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 90 475,48 | 7 257,21 | 5 572,69 | 3 400,73 | 172,33 | 90,79 | NO | 0,53 | 106 948,97 | | |
| **1. Energy** | 76 964,52 | 1 047,60 | 648,19 | | | | | | 78 660,31 | **26 741,66** | **51 918,65** |
| A. Fuel combustion (sectoral approach) | 76 853,19 | 509,01 | 648,19 | | | | | | 78 010,39 | 26 630,81 | **51 379,58** |
| 1. Energy industries | 18 719,68 | 28,60 | 170,19 | | | | | | 18 918,47 | 16 724,35 | **2 194,12** |
| 2. Manufacturing industries and construction | 13 314,78 | 47,13 | 90,47 | | | | | | 13 452,37 | 9 749,07 | **3 703,30** |
| 3. Transport | 22 079,70 | 22,75 | 276,43 | | | | | | 22 378,88 | 107,16 | **22 271,72** |
| 4. Other sectors | 22 635,80 | 410,43 | 110,04 | | | | | | 23 156,26 | 50,23 | **23 106,03** |
| 5. Other | 103,23 | 0,11 | 1,06 | | | | | | 104,40 | 0,00 | **104,40** |
| B. Fugitive emissions from fuels | 111,33 | 538,59 | NO | | | | | | 649,93 | 110,85 | **539,08** |
| 1. Solid fuels | NO | 40,28 | NO | | | | | | 40,28 | 0,00 | **40,28** |
| 2. Oil and natural gas | 111,33 | 498,31 | NO | | | | | | 609,64 | 110,85 | **498,79** |
| C. $CO_2$ transport and storage | | | | | | | | | | | |
| **2. Industrial processes and product use** | 14 281,85 | 33,37 | 752,83 | 3 400,73 | 172,33 | 90,79 | NO | 0,53 | 18 732,43 | **14 425,33** | **4 307,09** |
| A. Mineral industry | 4 125,39 | | | | | | | | 4 125,39 | 4 125,39 | **0,00** |
| B. Chemical industry | 6 963,39 | 16,67 | 685,62 | 795,72 | 162,34 | 2,68 | NA | NA | 8 626,42 | 7 232,18 | **1 394,24** |
| C. Metal industry | 3 049,30 | 16,70 | NO | | | | | | 3 066,00 | 3 049,30 | **16,70** |
| D. Non-energy products from fuels and solvent use | 125,37 | NO | NO | | | | | | 125,37 | 0,06 | **125,31** |
| E. Electronic Industry | | | | 1,80 | 9,97 | 6,36 | NO | 0,53 | 18,66 | 0,00 | **18,66** |
| F. Product uses as ODS substitutes | | | | 2 603,21 | 0,02 | | | | 2 603,23 | 0,00 | **2 603,23** |
| G. Other product manufacture and use | NO | NO | 67,21 | NO | NO | 81,75 | NO | NO | 148,96 | 0,00 | **148,96** |
| H. Other | 18,40 | NO | NO | NO | NO | NO | NO | NO | 18,40 | 18,40 | **0,00** |
| **3. Agriculture** | 182,37 | 5 266,35 | 3 920,99 | | | | | | 9 369,72 | | |
| A. Enteric fermentation | | 4 085,12 | | | | | | | 4 085,12 | | |
| B. Manure management | | 1 181,23 | 654,31 | | | | | | 1 835,54 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 3 266,68 | | | | | | 3 266,68 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 132,05 | | | | | | | | 132,05 | | |
| H. Urea application | 50,32 | | | | | | | | 50,32 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -1 213,56 | NO | 113,62 | | | | | | -1 120,71 | | |
| A. Forest land | -1 881,13 | NO | 0,03 | | | | | | -1 881,10 | | |
| B. Cropland | 810,87 | NO | 61,67 | | | | | | 872,54 | | |
| C. Grassland | -726,50 | NO | 2,98 | | | | | | -723,52 | | |
| D. Wetlands | -1,30 | NO | 0,03 | | | | | | -1,27 | | |
| E. Settlements | 520,29 | NO | 28,13 | | | | | | 548,42 | | |
| F. Other land | NO | NO | NO | | | | | | NO | | |
| G. Harvested wood products | 64,23 | | | | | | | | 64,23 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 260,30 | 909,88 | 137,04 | | | | | | 1 307,22 | | |
| A. Solid waste disposal | NO | 647,56 | | | | | | | 647,56 | | |
| B. Biological treatment of solid waste | | 22,89 | 34,92 | | | | | | 57,81 | | |
| C. Incineration and open burning of waste | 260,30 | 0,00 | 0,15 | | | | | | 260,44 | **222,67** | **37,78** |
| D. Waste water treatment and discharge | | 239,44 | 101,97 | | | | | | 341,41 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 31 921,29 | 5,26 | 250,27 | | | | | | 32 176,83 | | |
| Aviation | 5 174,63 | 0,85 | 42,99 | | | | | | 5 218,48 | | |
| Navigation | 26 746,65 | 4,41 | 207,28 | | | | | | 26 958,35 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 12 405,90 | | | | | | | | 12 405,90 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NA | | | | | | | | NA | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 108 069,68 | 41 389,66 | 66 680,02 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 106 948,97 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 108 069,68 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 106 948,97 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and

(2) See footnote 7 to table Summary 1.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| Unsurprisingly, the Covid-19 epidemic has had an impact on road transport with a decrease in fuel sales of 14.3% (in CO2 equivalent) at the national level. The total emissions (without LULUCF) would decrease with about 7.4%. The difference between the total reported ETS-emission data and the ETS-emissions reported in the greenhouse gas inventory is due to a different approach in methodologies and consequently the subtraction in the inventory of a part of the 'avoided' emissions of CO2 that are recuperated during the production of ammonia.<br>In Wallonia, first estimates of the emissions for the year 2020 indicate a decrease of the total GHG emissions. This decrease is evenly due to the ETS sector (energy, mineral and chemical industry sectors) and a milder winter (residential and tertiary sectors), 2020 being the warmest year currently measured in Belgium. The impact of COVID-19 remains limited on ETS emissions. However other impacts such as home working is not considered due to lack of data. In the case of the Brussels-Capital region, first estimates of the emissions for the year 2020 indicate a decrease of the total GHG emissions. This proxy is based on an estimate of the real energy consumption in the building sector. This evolution could be explained by a combination of factors such as warmer temperatures in 2020 than 2019, the COVID pandemic situation and consumer behaviour amongst others. In The Flemish region, first estimates of the emissions for the year 2020 indicate a significant decrease of the total GHG emissions. This decrease is mainly due to 1) the ETS sector (mainly energy and iron and steel sectors) a.o. caused by the COVID19-pandemic (lower oil demand and lower production) and a maintenance in one of the blast furnaces in this region and 2) a milder winter (residential and comercial sectors), 2020 being the warmest year currently measured in Belgium. However other impacts such as home working and the impact in the commercial sector is not yet considered due to lack of detailed data at this moment. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year: Proxy 2020
Submission: EEA 2021
Country: BULGARIA
Geographical scope[4]:

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 28109.99 | 6259.25 | 6011.39 | 1817.89 | 0.02 | 17.51 | NO,NA | NO,NA | 42216.06 | | |
| **1. Energy** | 34227.96 | 1405.98 | 370.48 | | | | | | 36004.42 | | |
| A. Fuel combustion (sectoral approach) | 33489.47 | 353.43 | 369.51 | | | | | | 34212.41 | | |
| 1. Energy industries | 19922.13 | 20.88 | 109.46 | | | | | | 20052.47 | | |
| 2. Manufacturing industries and construction | 3606.42 | 14.63 | 32.40 | | | | | | 3653.44 | | |
| 3. Transport | 8723.68 | 21.48 | 140.51 | | | | | | 8885.68 | | |
| 4. Other sectors | 1223.70 | 296.43 | 87.04 | | | | | | 1607.17 | | |
| 5. Other | 13.53 | 0.00 | 0.11 | | | | | | 13.65 | | |
| B. Fugitive emissions from fuels | 738.49 | 1052.55 | 0.97 | | | | | | 1792.01 | | |
| 1. Solid fuels | 22.67 | 814.51 | NO | | | | | | 837.18 | | |
| 2. Oil and natural gas | 715.82 | 238.04 | 0.97 | | | | | | 954.83 | | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 3778.81 | NO,NA | 792.07 | 1817.89 | 0.02 | 17.51 | NO,NA | NO,NA | 6406.31 | | |
| A. Mineral industry | 2363.33 | | | | | | | | 2363.33 | | |
| B. Chemical industry | 1120.05 | NO,NA | 779.62 | NA | NA | NA | NA | NA | 1899.68 | | |
| C. Metal industry | 170.44 | NO,NA | NA | NA | NA | NA | NA | NA | 170.44 | | |
| D. Non-energy products from fuels and solvent use | 100.55 | NO,NA | NO,NA | | | | | | 100.55 | | |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | 0.00 | | |
| F. Product uses as ODS substitutes | | | | 1817.89 | 0.02 | NO | NO | NO | 1817.91 | | |
| G. Other product manufacture and use | 24.45 | NO | 12.44 | NO | NO | 17.51 | NO | NO | 54.41 | | |
| H. Other | IE,NA | NA | NA | NO | NO | NO | NO | NO | IE,NA | | |
| **3. Agriculture** | 33.04 | 1874.08 | 4342.13 | | | | | | 6249.25 | | |
| A. Enteric fermentation | | 1434.83 | | | | | | | 1434.83 | | |
| B. Manure management | | 303.41 | 293.48 | | | | | | 596.89 | | |
| C. Rice cultivation | | 106.47 | | | | | | | 106.47 | | |
| D. Agricultural soils | | NO | 4040.47 | | | | | | 4040.47 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 29.37 | 8.18 | | | | | | 37.55 | | |
| G. Liming | NO | | | | | | | | NO | | |
| H. Urea application | 33.04 | | | | | | | | 33.04 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -9936.71 | 13.35 | 361.35 | | | | | | -9562.01 | | |
| A. Forest land | -8404.36 | 13.35 | 93.00 | | | | | | -8298.00 | | |
| B. Cropland | 103.43 | NO,NE | 78.59 | | | | | | 182.01 | | |
| C. Grassland | -1254.88 | NO,NE | 28.66 | | | | | | -1226.22 | | |
| D. Wetlands | 220.98 | NO | 25.36 | | | | | | 246.34 | | |
| E. Settlements | 736.73 | NO | 61.43 | | | | | | 798.16 | | |
| F. Other land | NO | NO | NO | | | | | | NO | | |
| G. Harvested wood products | -1338.61 | | | | | | | | -1338.61 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 6.88 | 2965.85 | 145.37 | | | | | | 3118.09 | | |
| A. Solid waste disposal | NO | 2556.51 | | | | | | | 2556.51 | | |
| B. Biological treatment of solid waste | | 9.55 | 6.83 | | | | | | 16.39 | | |
| C. Incineration and open burning of waste | 6.88 | 0.00 | 0.97 | | | | | | 7.85 | | |
| D. Waste water treatment and discharge | | 399.78 | 137.57 | | | | | | 537.35 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 962.03 | 0.67 | 7.93 | | | | | | 970.64 | | |
| Aviation | 727.89 | 0.13 | 6.07 | | | | | | 734.08 | | |
| Navigation | 234.15 | 0.55 | 1.87 | | | | | | 236.56 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 8135.17 | | | | | | | | 8135.17 | | |
| **$CO_2$ captured** | NO,IE | | | | | | | | NO,IE | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | 1057.49 | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 51778.07 | 23845.295 | 27932.77 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 42216.06 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 51778.07 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 42216.06 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and for
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS | | | | | | | | Year | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Sheet 1 of 1) | | | | | | | | Submission | 2021 | | |
| | | | | | | | | Country | Cyprus | | |
| | | | | | | | | Geographical scope[4] | Areas under the effective control of the Reput | | |
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
| | $CO_2$ equivalent (kt ) | | | | | | | | | CO2 equivalent (Gg ) | |
| **Total (net emissions)[1]** | 6 388,84 | 875,22 | 280,47 | 344,59 | NO | 15,11 | NO | NO | 7 904,23 | 4 307,16 | 3 597,06 |
| **1. Energy** | 5 915,44 | 28,57 | 58,67 | | | | | | 6 002,67 | **3 410,55** | **2 592,12** |
| A. Fuel combustion (sectoral approach) | 5 915,44 | 28,57 | 58,67 | | | | | | 6 002,67 | 3 410,55 | **2 592,12** |
| 1. Energy industries | 3 013,58 | 3,00 | 7,10 | | | | | | 3 023,67 | 3 003,73 | **19,94** |
| 2. Manufacturing industries and construction | 559,33 | 1,75 | 3,04 | | | | | | 564,12 | 394,55 | **169,57** |
| 3. Transport | 1 820,67 | 9,56 | 46,46 | | | | | | 1 876,69 | 12,27 | **1 864,42** |
| 4. Other sectors | 501,01 | 14,19 | 2,06 | | | | | | 517,26 | 0,00 | **517,26** |
| 5. Other | 20,86 | 0,07 | 0,00 | | | | | | 20,93 | 0,00 | **20,93** |
| B. Fugitive emissions from fuels | NO | NO | NO | | | | | | 0,00 | 0,00 | **0,00** |
| 1. Solid fuels | NO | NO | NO | | | | | | 0,00 | 0,00 | **0,00** |
| 2. Oil and natural gas | NO | NO | NO | | | | | | 0,00 | 0,00 | **0,00** |
| C. $CO_2$ transport and storage | NO | | | | | | | | 0,00 | 0,00 | **0,00** |
| **2. Industrial processes and product use** | 918,82 | 0,00 | 6,69 | 344,59 | NO | 15,11 | NO | NO | 1 285,20 | **896,61** | **388,59** |
| A. Mineral industry | 904,33 | | | | | | | | 904,33 | 896,61 | **7,72** |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| C. Metal industry | NO | NO | NO | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| D. Non-energy products from fuels and solvent use | 14,49 | NE | NE | | | | | | 14,49 | 0,00 | **14,49** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| F. Product uses as ODS substitutes | | | | 344,59 | NO | NO | NO | NO | 344,59 | 0,00 | **344,59** |
| G. Other product manufacture and use | IE | NE | 6,69 | NO | NO | 15,11 | NO | NO | 21,80 | 0,00 | **21,80** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| **3. Agriculture** | 0,22 | 323,00 | 193,76 | | | | | | 516,98 | | |
| A. Enteric fermentation | | 272,31 | | | | | | | 272,31 | | |
| B. Manure management | | 50,28 | 70,53 | | | | | | 120,80 | | |
| C. Rice cultivation | | NO | | | | | | | 0,00 | | |
| D. Agricultural soils | | NE | 123,11 | | | | | | 123,11 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | 0,00 | | |
| F. Field burning of agricultural residues | | 0,41 | 0,13 | | | | | | 0,53 | | |
| G. Liming | NO | | | | | | | | 0,00 | | |
| H. Urea application | 0,22 | | | | | | | | 0,22 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | 0,00 | | |
| J. Other | NO | NO | NO | | | | | | 0,00 | | |
| **4. Land use, land-use change and forestry[1]** | -445,64 | 0,61 | 0,21 | | | | | | -444,82 | | |
| A. Forest land | NE | NE | NE | | | | | | 0,00 | | |
| B. Cropland | NE | NO | NE | | | | | | 0,00 | | |
| C. Grassland | NE | NO | NE | | | | | | 0,00 | | |
| D. Wetlands | NO | NO | NO | | | | | | 0,00 | | |
| E. Settlements | NE | NE | NO | | | | | | 0,00 | | |
| F. Other land | NE | NO | NO | | | | | | 0,00 | | |
| G. Harvested wood products | NE | | | | | | | | 0,00 | | |
| H. Other | NO | NO | NO | | | | | | 0,00 | | |
| **5. Waste** | 0,00 | 523,05 | 21,14 | | | | | | 544,19 | | |
| A. Solid waste disposal | NO | 502,00 | | | | | | | 502,00 | | |
| B. Biological treatment of solid waste | | 5,81 | 4,11 | | | | | | 9,91 | | |
| C. Incineration and open burning of waste | NO | NO | NO | | | | | | 0,00 | | |
| D. Waste water treatment and discharge | | 15,24 | 17,04 | | | | | | 32,28 | | |
| E. Other | NO | NO | NO | | | | | | 0,00 | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | 0,00 | 0,00 | 0,00 |

| **Memo items:[2]** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 950,52 | 1,48 | 10,23 | | | | | | 962,23 | | |
| Aviation | 163,30 | 0,03 | 1,36 | | | | | | 164,69 | | |
| Navigation | 787,22 | 1,45 | 8,87 | | | | | | 797,54 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | 0,00 | | |
| **$CO_2$ emissions from biomass** | 313,04 | | | | | | | | 313,04 | | |
| **$CO_2$ captured** | NO | | | | | | | | 0,00 | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | 0,00 | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | 8,07 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 8 349,04 | 4 307,16 | 4 041,88 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 7 904,23 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 8 357,12 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 7 912,30 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and

(2) See footnote 7 to table Summary 1.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Czechia
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 107 822,07 | 11 866,52 | 5 672,08 | 4 008,80 | 1,55 | 64,64 | 0,00 | 3,47 | 129 439,13 | 54 284,89 | 75 154,24 |
| **1. Energy** | 85 259,91 | 3 181,83 | 619,39 | | | | | | 89 061,13 | **44 622,00** | **44 439,13** |
| A. Fuel combustion (sectoral approach) | 85 218,05 | 1 020,15 | 619,38 | | | | | | 86 857,58 | 44 622,00 | **42 235,58** |
| 1. Energy industries | 45 800,92 | 32,72 | 217,43 | | | | | | 46 051,07 | IE | |
| 2. Manufacturing industries and construction | 8 562,10 | 34,67 | 55,55 | | | | | | 8 652,32 | IE | |
| 3. Transport | 18 637,22 | 23,62 | 192,32 | | | | | | 18 853,16 | NO | **18 853,16** |
| 4. Other sectors | 11 923,80 | 928,37 | 145,33 | | | | | | 12 997,50 | NO | **12 997,50** |
| 5. Other | 294,01 | 0,77 | 8,75 | | | | | | 303,53 | NO | **303,53** |
| B. Fugitive emissions from fuels | 41,86 | 2 161,68 | 0,01 | | | | | | 2 203,55 | NO | **2 203,55** |
| 1. Solid fuels | 38,47 | 1 566,81 | NO | | | | | | 1 605,28 | NO | **1 605,28** |
| 2. Oil and natural gas | 3,39 | 594,87 | 0,01 | | | | | | 598,27 | NO | **598,27** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 11 104,85 | 60,05 | 674,01 | 4 008,80 | 1,55 | 64,64 | 0,00 | 3,47 | 15 917,37 | **9 662,89** | **6 254,48** |
| A. Mineral industry | 2 936,00 | | | | | | | | 2 936,00 | 2 910,00 | **26,00** |
| B. Chemical industry | 1 835,02 | 46,86 | 450,51 | NO | NO | NO | NO | NO | 2 332,39 | 1 179,89 | **1 152,50** |
| C. Metal industry | 6 225,46 | 13,19 | NA | NO | NO | NO | NO | NO | 6 238,65 | 5 573,00 | **665,65** |
| D. Non-energy products from fuels and solvent use | 107,72 | NO | NO | | | | | | 107,72 | NO | **107,72** |
| E. Electronic Industry | | | | | 0,36 | 3,35 | | 3,47 | 7,18 | NO | **7,18** |
| F. Product uses as ODS substitutes | | | | 4 008,41 | 1,19 | NO | NO | NO | 4 009,60 | NO | **4 009,60** |
| G. Other product manufacture and use | NO | NO | 223,50 | NO | NO | 61,29 | NO | NO | 284,79 | NO | **284,79** |
| H. Other | 0,65 | NO | NO | 0,39 | NO | NO | NO | NO | 1,04 | NO | **1,04** |
| **3. Agriculture** | 312,34 | 3 400,54 | 4 074,37 | | | | | | 7 787,25 | | |
| A. Enteric fermentation | | 3 064,39 | | | | | | | 3 064,39 | | |
| B. Manure management | | 336,15 | 434,92 | | | | | | 771,07 | | |
| C. Rice cultivation | | NO | | | | | | | 0,00 | | |
| D. Agricultural soils | | NO | 3 639,45 | | | | | | 3 639,45 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | 0,00 | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | 0,00 | | |
| G. Liming | 163,21 | | | | | | | | 163,21 | | |
| H. Urea application | 149,13 | | | | | | | | 149,13 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | 0,00 | | |
| J. Other | NO | NO | NO | | | | | | 0,00 | | |
| **4. Land use, land-use change and forestry[1]** | 11 032,32 | 29,86 | 22,00 | | | | | | 11 084,18 | | |
| A. Forest land | 12 523,53 | 29,86 | 19,69 | | | | | | 12 573,08 | | |
| B. Cropland | 96,25 | NO | 2,31 | | | | | | 98,56 | | |
| C. Grassland | -265,72 | NO | NO | | | | | | -265,72 | | |
| D. Wetlands | 35,04 | NO | NO | | | | | | 35,04 | | |
| E. Settlements | 149,20 | NO | NO | | | | | | 149,20 | | |
| F. Other land | NO | NO | NO | | | | | | 0,00 | | |
| G. Harvested wood products | -1 505,98 | | | | | | | | -1 505,98 | | |
| H. Other | NO | NO | NO | | | | | | 0,00 | | |
| **5. Waste** | 112,65 | 5 194,24 | 282,31 | | | | | | 5 589,20 | | |
| A. Solid waste disposal | 0,00 | 3 752,15 | | | | | | | 3 752,15 | | |
| B. Biological treatment of solid waste | | 655,70 | 80,25 | | | | | | 735,95 | | |
| C. Incineration and open burning of waste | 112,65 | 0,00 | 3,17 | | | | | | 115,82 | | |
| D. Waste water treatment and discharge | | 786,39 | 198,89 | | | | | | 985,28 | | |
| E. Other | NO | NO | NO | | | | | | 0,00 | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 349,68 | 0,06 | 2,95 | | | | | | 352,69 | | |
| Aviation | 349,68 | 0,06 | 2,95 | | | | | | 352,69 | | |
| Navigation | NO | NO | NO | | | | | | NO | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 18 093,20 | | | | | | | | 18 093,20 | | |
| **$CO_2$ captured** | NO | | | | | | | | 0,00 | | |
| **Long-term storage of C in waste disposal sites** | 48 050,56 | | | | | | | | 48 050,56 | | |
| **Indirect $N_2O$** | | | 226,31 | | | | | | | | |
| **Indirect $CO_2$[3]** | 625,73 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 118 354,95 | 54 284,89 | 64 070,06 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 129 439,13 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 118 980,68 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 130 064,86 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
|---|
| 1 Energy<br>Stationary<br>Approximated GHG inventory was created using linear regression for the last 5 years and further extrapolation together with the degradation of values due to the pandemic. According to the year-on-year indices at CzSO (industrial production), information about changes in each month were taken. Based on this we made average from these values. And we decreased values arrised from the linear regression about this indices. This was done for sector 1A1, 1A2 and for fugitive emissions 1B1 (solid fuels). For the 1A4, 1A5 and 1B2 we did not have indices from the CzSO, therefore we decided to use data only from the linear regression as in previous years.<br>Transport<br>Road transport is calculated by the COPERT 5 program, which is based on the EMEP/EEA Emission inventory Guidebook 2019 and the IPCC 2006 Guidelines - CO2 is calculated by Tier 2 and other pollutants by Tier 3. Other modes of transport are calculated by the CDV model, which is based on national specific EF and factors from the IPCC Guidelines, mostly at the Tier 1 level.<br>2 IPPU<br>Mineral industry estimation is based on ETS data value for year 2020 and correlation of previous years values between ETS and NIR data. The ETS data results for 2020 was used to calculate production changes in sector 2C. Category 2E+2G were estimated according to the trend in last decade. Prediction model produces predicted values for 2F, obtained by evaluating the regression function in the selected time frame (in most cases time series 2011-2019). Standard errors of the predictions are also calculated. For more accurate estimations outliers from the activity data were removed, also overall trend across whole time series was checked. In some cases, input for prediction model was based on expert judgement, mainly in cases where trend change was observed and it is expected that new trend remains (Category 2H3 contains HFO-1234yf emission estimates related to category 2.F.1.e). Category 2H1 was interpolated by using data from last year and ETS 2020 value for this category.<br>3 Agriculture<br>The estimated emissions in the sector slightly decreased of about 4 % in comparison with previous submission. This is a consequence of the continuous updating of methodological procedures and the gradual transition to national specific data. The AWMS system is updated for Submission 2021, and methane emissions from manure management are estimated using national data. Thanks to OAQC processes, technical errors in the calculation file were detected and corrected.<br>4 LULUCF<br>Estimates for 4A Forest land were revised using CBM-CFS3 model which was used for dead organic matter (DOM) and soil carbon pools. These pools were previously included either incompletely (DOM including littter and deadwood) or not reported (soil). Entire time period since 1990 was recalculated. These changes affected estimates for both 4A1 (land remaining) and 4A2 (land comversions) categories. Estimates for Cropland (4B), Grassland (4C), Wetlands (4D) and Settlements (4E) were also recalculated due to some ammendments and rectifications affecting soil carbon pool estimates.<br>5 Waste<br>Almost all values were made as linear extrapolation of the waste treated or/and gas produced and follow-up emissions calculated. Data on inhabitants, sewer connection etc. in 5.D have been available. In 5.A and 5.C there is expected an increase in clinical and municipal solid waste because of the covid-19 pandemic. Due to the increased waste production but no detailed data on treatment available yet, this approximation is probably uncertain but the emissions probably grow. There are also planned recalculations: 5.D emission factors (already used in revised estimate), and 5.A waste composition. The emissions in 5.D will be lower, the effect of changed waste composition on emissions in 5.A is not so clear. All emissions except in 5.D are considered to be higher than in 2019. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Germany
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 624 713.98 | 49 950.15 | 35 589.79 | 9 238.23 | 224.86 | 3 051.87 | 198.91 | 11.18 | 722 978.96 | | |
| **1. Energy** | 597 876.65 | 9 443.26 | 4 702.49 | | | | | | 612 022.40 | **272 612.89** | **339 409.50** |
| A. Fuel combustion (sectoral approach) | 596 023.20 | 4 310.73 | 4 701.50 | | | | | | 605 035.42 | 272 374.63 | **332 660.79** |
| 1. Energy industries | 207 731.23 | 2 824.27 | 1 797.46 | | | | | | 212 352.95 | 181 619.81 | **30 733.14** |
| 2. Manufacturing industries and construction | 118 849.06 | 284.90 | 809.86 | | | | | | 119 943.82 | 89 474.15 | **30 469.67** |
| 3. Transport | 144 891.35 | 196.37 | 1 653.76 | | | | | | 146 741.47 | 768.99 | **145 972.49** |
| 4. Other sectors | 123 788.81 | 1 004.20 | 436.98 | | | | | | 125 230.00 | 433.05 | **124 796.94** |
| 5. Other | 762.75 | 0.99 | 3.44 | | | | | | 767.18 | 78.64 | **688.54** |
| B. Fugitive emissions from fuels | 1 853.45 | 5 132.53 | 0.99 | | | | | | 6 986.97 | 238.26 | **6 748.71** |
| 1. Solid fuels | 581.97 | 142.83 | NA | | | | | | 724.80 | IE | **724.80** |
| 2. Oil and natural gas | 1 271.48 | 4 989.70 | 0.99 | | | | | | 6 262.17 | 238.26 | **6 262.17** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 43 938.37 | 522.63 | 980.16 | 9 238.23 | 224.86 | 3 051.87 | 198.91 | 11.18 | 58 166.20 | **47 627.17** | **10 539.03** |
| A. Mineral industry | 19 381.22 | | | | | | | | 19 381.22 | 18 955.25 | **425.97** |
| B. Chemical industry | 5 513.73 | 492.89 | 592.87 | IE | IE | IE | IE | IE | 6 599.49 | 4 027.61 | **2 571.87** |
| C. Metal industry | 17 046.10 | 6.14 | 12.99 | IE | IE | IE | IE | IE | 17 065.23 | 24 644.30 | **-7 579.08** |
| D. Non-energy products from fuels and solvent use | 1 997.32 | NA | 1.30 | | | | | | 1 998.62 | NA | |
| E. Electronic Industry | | | | IE | IE | IE | IE | IE | IE | NA | |
| F. Product uses as ODS substitutes | | | | IE | IE | IE | IE | IE | IE | NA | |
| G. Other product manufacture and use | NA | 23.60 | 373.00 | IE | IE | IE | IE | IE | 396.60 | NA | |
| H. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| **3. Agriculture** | 2 639.30 | 30 243.88 | 27 527.51 | | | | | | 60 410.68 | | |
| A. Enteric fermentation | | 23 177.50 | | | | | | | 23 177.50 | | |
| B. Manure management | | 5 750.85 | 2 891.26 | | | | | | 8 642.11 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 24 378.70 | | | | | | 24 378.70 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 1 988.23 | | | | | | | | 1 988.23 | | |
| H. Urea application | 461.85 | | | | | | | | 461.85 | | |
| I. Other carbon-containing fertilizers | 189.21 | | | | | | | | 189.21 | | |
| J. Other | NA | 1 315.52 | 257.54 | | | | | | 1 573.06 | | |
| **4. Land use, land-use change and forestry[1]** | -19 740.34 | 1 703.48 | 1 521.21 | | | | | | -16 515.65 | | |
| A. Forest land | -57 023.32 | 43.03 | 383.72 | | | | | | -56 596.58 | | |
| B. Cropland | 16 232.55 | 134.09 | 645.57 | | | | | | 17 012.20 | | |
| C. Grassland | 17 543.44 | 947.47 | 122.47 | | | | | | 18 613.38 | | |
| D. Wetlands | 4 330.83 | 508.80 | 42.36 | | | | | | 4 881.99 | | |
| E. Settlements | 4 105.57 | 70.11 | 327.09 | | | | | | 4 502.77 | | |
| F. Other land | NO | NO | NO | | | | | | NO | | |
| G. Harvested wood products | -4 929.41 | | | | | | | | -4 929.41 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 0.00 | 8 036.91 | 858.42 | | | | | | 8 895.33 | | |
| A. Solid waste disposal | NA | 6 847.35 | | | | | | | 6 847.35 | | |
| B. Biological treatment of solid waste | | 704.23 | 306.81 | | | | | | 1 011.04 | | |
| C. Incineration and open burning of waste | NO | NO | NO | | | | | | NO | | |
| D. Waste water treatment and discharge | | 482.94 | 518.50 | | | | | | 1 001.44 | | |
| E. Other | NE | 2.39 | 33.11 | | | | | | 35.50 | | |
| **6. Other** *(as specified in summary 1.A)* | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 16 894.37 | 2.74 | 171.68 | | | | | | 17 068.79 | | |
| Aviation | 13 674.37 | 2.00 | 128.93 | | | | | | 13 805.30 | | |
| Navigation | 3 220.00 | 0.74 | 42.76 | | | | | | 3 263.50 | | |
| **Multilateral operations** | NE | NE | NE | | | | | | NE | | |
| **$CO_2$ emissions from biomass** | 104 512.30 | | | | | | | | 104 512.30 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NO | | | | | | | | NO | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 739 494.61 | | |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 722 978.96 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | | | |

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| Please refer to our description within press release under https://www.umweltbundesamt.de/en/press/pressinformation/germanys-greenhouse-gas-emissions-down-87-percent<br><br>Comment on 2.C: In terms of iron & steel the aggregation level of ETS data is considerably higher compared to inventory data. Therefore a precise allocation to process emissions and combustion related emissions is not possible in many cases. Actually a part of the ETS emissions in source category 2.C.1 would have to be allocated to source category 1.A.2.a |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Denmark
Geographical scope[4] Denmark excl. Greenland and the Faroe Island

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 27 535,30 | 7 143,02 | 5 459,43 | 335,79 | 0,01 | 71,24 | NA | NA | 40 544,79 | | |
| **1. Energy** | 25 818,93 | 303,54 | 350,16 | | | | | | 26 472,63 | **9 531,12** | **16 941,51** |
| A. Fuel combustion (sectoral approach) | 25 691,83 | 227,82 | 315,95 | | | | | | 26 235,59 | 9 405,45 | **16 830,15** |
| 1. Energy industries | 6 774,71 | 90,85 | 62,79 | | | | | | 6 928,35 | 6 916,78 | **11,57** |
| 2. Manufacturing industries and construction | 3 741,99 | 25,59 | 56,37 | | | | | | 3 823,95 | 2 460,69 | **1 363,26** |
| 3. Transport | 11 359,44 | 8,51 | 121,34 | | | | | | 11 489,29 | 0,00 | **11 489,29** |
| 4. Other sectors | 3 617,81 | 102,64 | 73,32 | | | | | | 3 793,76 | 27,98 | **3 765,78** |
| 5. Other | 197,88 | 0,23 | 2,14 | | | | | | 200,25 | 0,00 | **200,25** |
| B. Fugitive emissions from fuels | 127,10 | 75,72 | 34,21 | | | | | | 237,04 | 125,68 | **111,36** |
| 1. Solid fuels | NA | NA | NA | | | | | | NA | NA | |
| 2. Oil and natural gas | 127,10 | 75,72 | 34,21 | | | | | | 237,04 | 125,68 | **111,36** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NA | |
| **2. Industrial processes and product use** | 1 508,17 | 2,50 | 19,02 | 335,79 | 0,01 | 71,24 | NA | NA | 1 936,74 | **1 301,31** | **635,44** |
| A. Mineral industry | 1 347,72 | | | | | | | | 1 347,72 | 1 301,31 | **46,41** |
| B. Chemical industry | 1,49 | NA | NA | NA | NA | NA | NA | NA | 1,49 | 0,00 | **1,49** |
| C. Metal industry | 0,11 | NO | NO | NO | NO | NO | NO | NO | 0,11 | 0,00 | **0,11** |
| D. Non-energy products from fuels and solvent use | 158,66 | 0,45 | 0,15 | | | | | | 159,26 | 0,00 | **159,26** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| F. Product uses as ODS substitutes | | | | 335,79 | 0,01 | NA | NA | NA | 335,80 | 0,00 | **335,80** |
| G. Other product manufacture and use | 0,18 | 2,06 | 18,88 | NA | NA | 71,24 | NA | NA | 92,36 | 0,00 | **92,36** |
| H. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| **3. Agriculture** | 185,21 | 5 840,29 | 4 872,13 | | | | | | 10 897,64 | | |
| A. Enteric fermentation | | 3 718,88 | | | | | | | 3 718,88 | | |
| B. Manure management | | 2 117,56 | 660,14 | | | | | | 2 777,70 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 4 210,80 | | | | | | 4 210,80 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 3,86 | 1,19 | | | | | | 5,05 | | |
| G. Liming | 181,40 | | | | | | | | 181,40 | | |
| H. Urea application | 0,72 | | | | | | | | 0,72 | | |
| I. Other carbon-containing fertilizers | 3,09 | | | | | | | | 3,09 | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NE | NE | | | | | | NE | | |
| E. Settlements | NE | NE | NE | | | | | | NE | | |
| F. Other land | NE | NE | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NE | NE | NE | | | | | | NE | | |
| **5. Waste** | 22,99 | 996,68 | 218,11 | | | | | | 1 237,78 | | |
| A. Solid waste disposal | NO | 534,21 | | | | | | | 534,21 | | |
| B. Biological treatment of solid waste | | 407,27 | 74,30 | | | | | | 481,57 | | |
| C. Incineration and open burning of waste | NA | 0,02 | 0,28 | | | | | | 0,30 | | |
| D. Waste water treatment and discharge | | 52,37 | 143,53 | | | | | | 195,90 | | |
| E. Other | 22,99 | 2,81 | NA | | | | | | 25,81 | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | NE | NE | NE | | | | | | NE | | |
| Navigation | NE | NE | NE | | | | | | NE | | |
| **Multilateral operations** | NE | NE | NE | | | | | | NE | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NE | | | | | | | | NE | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | 270,00 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 40 544,79 | 10 832,43 | 17 576,95 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 40 814,79 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Estonia
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 9 272,36 | 1 124,73 | 965,08 | 217,77 | NO | 2,90 | NO | NO | 11 582,84 | | |
| **1. Energy** | 9 156,09 | 171,77 | 112,56 | | | | | | 9 440,42 | **5 548,96** | **3 891,46** |
| A. Fuel combustion (sectoral approach) | 9 156,06 | 153,54 | 112,56 | | | | | | 9 422,17 | 5 548,96 | **3 873,20** |
| 1. Energy industries | 5 677,45 | 23,24 | 40,98 | | | | | | 5 741,68 | 5 452,48 | **289,20** |
| 2. Manufacturing industries and construction | 451,03 | 1,86 | 3,00 | | | | | | 455,88 | 92,02 | **363,86** |
| 3. Transport | 2 522,63 | 3,02 | 24,70 | | | | | | 2 550,35 | 1,84 | **2 548,51** |
| 4. Other sectors | 504,96 | 125,41 | 43,89 | | | | | | 674,26 | 2,63 | **671,63** |
| 5. Other | NO | NO | NO | | | | | | NO | NO | |
| B. Fugitive emissions from fuels | 0,03 | 18,23 | NO | | | | | | 18,26 | NO | **18,26** |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | NO | |
| 2. Oil and natural gas | 0,03 | 18,23 | NO | | | | | | 18,26 | NO | **18,26** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 99,84 | NO | 3,09 | 217,77 | NO | 2,90 | NO | NO | 323,61 | **70,29** | **253,32** |
| A. Mineral industry | 70,32 | | | | | | | | 70,32 | 70,29 | **0,03** |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| C. Metal industry | 2,86 | NO | NO | NO | NO | NO | NO | NO | 2,86 | NO | **2,86** |
| D. Non-energy products from fuels and solvent use | 26,67 | NO | NO | | | | | | 26,67 | NO | **26,67** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | |
| F. Product uses as ODS substitutes | | | | 217,77 | NO | NO | NO | NO | 217,77 | NO | **217,77** |
| G. Other product manufacture and use | NO | NO | 3,09 | NO | NO | 2,90 | NO | NO | 5,99 | NO | **5,99** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 15,86 | 698,95 | 802,15 | | | | | | 1 516,97 | **NE** | **1 516,97** |
| A. Enteric fermentation | | 551,14 | | | | | | | 551,14 | | |
| B. Manure management | | 147,81 | 66,79 | | | | | | 214,60 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NO | 735,36 | | | | | | 735,36 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 15,73 | | | | | | | | 15,73 | | |
| H. Urea application | 0,13 | | | | | | | | 0,13 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NE | NE | | | | | | NE | | |
| E. Settlements | NE | NE | NE | | | | | | NE | | |
| F. Other land | NE | NE | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NE | NE | NE | | | | | | NE | | |
| **5. Waste** | 0,57 | 254,01 | 47,27 | | | | | | 301,85 | **NE** | **301,85** |
| A. Solid waste disposal | NO | 181,77 | | | | | | | 181,77 | | |
| B. Biological treatment of solid waste | | 20,05 | 14,34 | | | | | | 34,39 | | |
| C. Incineration and open burning of waste | 0,57 | 0,25 | 0,05 | | | | | | 0,87 | | |
| D. Waste water treatment and discharge | | 51,94 | 32,88 | | | | | | 84,82 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 914,98 | 2,14 | 7,48 | | | | | | 924,60 | | |
| Aviation | 82,07 | 0,14 | 0,67 | | | | | | 82,88 | | |
| Navigation | 832,90 | 2,00 | 6,81 | | | | | | 841,72 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 4 780,28 | | | | | | | | 4 780,28 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | IE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 11 582,84 | 5 619,25 | 5 963,59 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 11 582,84 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

TOTAL GHG emissions: Total GHG emissions in 2020 decreased 21.2% compared to 2019 mainly due to decreased emissions in Energy sector. ETS emission have decreased by 33.8% in 2020 compared to 2019. According to the Proxy estimates non-ETS emissions have decreased by 3.9% compared to 2018. The drivers underpinning the total GHG emission decrease are elaborated below.

Energy: Total GHG emissions in Energy sector have decreased 23.1% compared to year 2019 due to a decrease in emissions from Energy industries in the public electricity and heat production, because of the increase of the EU ETS emission allowance price in 2020. The CO2 allowance price increase affected the electricity production of oil shale combustion plants and their output.
Emissions increased in the Transportation sector by almost 6.5% due to increase in diesel fuel demand in road transportation, which is a result of lowered fuel tax on diesel fuel. Although alternative fuel consumption has increased, the lowered fuel tax on diesel fuel had a bigger impact on increasing the emissions in the transportation sector. In the ETS and non-ETS section in the table above CO2 emissions from domestic aviation have been presented under the column ETS (category 1.A.3).
Emissions decreased in the Manufacturing industries and construction sector by 38.9% compared to year 2019, mainly from the cement production due to the increase of the EU ETS emission allowance price in 2020.
The Energy sector´s proxy estimation are based on Statistics Estonia´s short term fuel consumption statistics (mini Joint Questionnaires), which are preliminary estimations for 2020. However, the national inventory report is based on annual Joint Questionnaires, which is compiled in autumn and is more detailed and therefore changes in the final emission estimations are foreseen.

IPPU: Total emissions from IPPU sector decreased by 47.7% in comparison to 2019. The reason for this large decrease is that clinker production was discontinued in March 2020. Emissions from other categories than Mineral industry had little effect on the total decrease in 2020 in comparison to 2019.
The emissions of F-gases decreased a few tonnes in comparison to 2019. This decrease has many reasons: decrease in HFC use in foam production, in aerosols, decrease of vehicles having HFC-134a in their air conditioner (due to ban on HFC-134a according to the Directive 2006/40/EC) and replacing some commercial and industrial refrigeration equipment with zero or lower GWP refrigerants.
Indirect CO2 emissions from NMVOC from solvent use and road paving with asphalt (ca 20.86 kt CO2) are included into 2.D subsector.

Agriculture: Total emissions from Agriculture sector in 2020 increased by 1.33% compared to 2019. The main increase of emissions in 2019 compared to the previous year occurred in 3.B Manure Management subcategory (increased by 4,01%). This is mainly caused by the increase of the number of swine, especially the increase in the number of fattening pigs. Emissions from 3.A Enteric Fermentation increased very slightly, 0,9%, this is also mostly due to the increase in number of pigs, especially in the number of fattening pigs. Emissions from 3.D Agricultural Soils, 3.G Liming and 3.H Urea application remain at the same level compared to the 2019 emissions.

Waste: Total emissions from waste sector in 2020 decreased by 1.4% compared to 2019. Activity data for calculating 2020 waste sector emissions under categories 5.A, 5.B and 5.C is under inspection by the Estonian Environment Agency and is not yet available. Due to this, activity data from 2021 submission is used for calculating emissions in 5A and additional corrections for 2019 emissions are made in 5.B (deleting double counting of one company) and 5.C (updating calorific values for CH4 calculations in 5.C.1). For calculating emissions under 5.D, plant specific data was used for industrial wastewater emission calculation. Because the % of centralized wastewater system coverage will be updated by autumn, therefore data from 2021 submission was used for domestic wastewater emission calculation. Because waste activity data is not yet available than Long-term storage of C in waste disposal sites has not been estimated.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 1
Country Spain
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 172 456,82 | 38 704,67 | 18 385,49 | 3 659,81 | 31,59 | 227,97 | 1 428,00 | NA | 234 894,35 | | |
| **1. Energy** | 192 556,91 | 2 288,48 | 1 629,98 | | | | | | 196 475,38 | **76 200,68** | **120 274,70** |
| A. Fuel combustion (sectoral approach) | 188 924,65 | 2 125,92 | 1 629,96 | | | | | | 192 680,54 | 72 954,52 | **119 726,01** |
| 1. Energy industries | 39 466,59 | 268,96 | 353,86 | | | | | | 40 089,40 | 38 846,77 | **1 242,63** |
| 2. Manufacturing industries and construction | 41 003,78 | 861,43 | 188,48 | | | | | | 42 053,69 | 32 324,57 | **9 729,12** |
| 3. Transport | 74 439,63 | 80,85 | 813,27 | | | | | | 75 333,76 | 1 617,17 | **73 716,59** |
| 4. Other sectors | 33 566,52 | 914,38 | 270,49 | | | | | | 34 751,40 | 166,01 | **34 585,39** |
| 5. Other | 448,13 | 0,30 | 3,86 | | | | | | 452,29 | 0,00 | **452,29** |
| B. Fugitive emissions from fuels | 3 632,26 | 162,57 | 0,02 | | | | | | 3 794,84 | 3 246,16 | **548,68** |
| 1. Solid fuels | 6,45 | 15,84 | NA | | | | | | 22,29 | 0,00 | **22,29** |
| 2. Oil and natural gas | 3 625,81 | 146,73 | 0,02 | | | | | | 3 772,55 | 3 246,16 | **526,40** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 16 421,86 | 109,06 | 937,40 | 3 659,81 | 31,59 | 227,97 | 1 428,00 | NA | 22 815,70 | **14 460,76** | **8 354,95** |
| A. Mineral industry | 10 501,49 | | | | | | | | 10 501,49 | 10 360,27 | **141,23** |
| B. Chemical industry | 3 137,69 | 91,24 | 366,47 | NA | NA | NA | NA | NA | 3 595,40 | 2 047,96 | **1 547,44** |
| C. Metal industry | 2 012,25 | 17,83 | NA | NA | 24,61 | NA | NA | NA | 2 054,68 | 2 052,53 | **2,16** |
| D. Non-energy products from fuels and solvent use | 770,43 | NA | NA | | | | | | 770,43 | 0,00 | **770,43** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NA | NO | NO | |
| F. Product uses as ODS substitutes | | | | 3 659,81 | 6,99 | NA | 1 428,00 | NA | 5 094,80 | 0,00 | **5 094,80** |
| G. Other product manufacture and use | NO | NO | 570,89 | NA | NA | 227,97 | NA | NA | 798,87 | 0,00 | **798,87** |
| H. Other | NA | NA | 0,04 | NA | NA | NA | NA | NA | 0,04 | 0,00 | **0,04** |
| **3. Agriculture** | 533,09 | 23 660,90 | 14 069,33 | | | | | | 38 263,32 | | |
| A. Enteric fermentation | | 16 039,45 | | | | | | | 16 039,45 | | |
| B. Manure management | | 7 174,70 | 1 590,23 | | | | | | 8 764,93 | | |
| C. Rice cultivation | | 424,26 | | | | | | | 424,26 | | |
| D. Agricultural soils | | IE | 12 472,15 | | | | | | 12 472,15 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 22,50 | 6,95 | | | | | | 29,45 | | |
| G. Liming | 32,20 | | | | | | | | 32,20 | | |
| H. Urea application | 500,89 | | | | | | | | 500,89 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -37 055,04 | 173,43 | 269,94 | | | | | | -36 611,66 | | |
| A. Forest land | -32 983,86 | 159,50 | 146,94 | | | | | | -32 677,42 | | |
| B. Cropland | -3 915,77 | 8,20 | 51,20 | | | | | | -3 856,38 | | |
| C. Grassland | 706,82 | 5,74 | 12,87 | | | | | | 725,43 | | |
| D. Wetlands | 68,94 | 0,00 | 0,00 | | | | | | 68,94 | | |
| E. Settlements | 1 249,18 | NO | 58,01 | | | | | | 1 307,19 | | |
| F. Other land | 10,88 | NO | 0,93 | | | | | | 11,80 | | |
| G. Harvested wood products | -2 191,22 | | | | | | | | -2 191,22 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | NA | 12 472,79 | 1 478,82 | | | | | | 13 951,61 | | |
| A. Solid waste disposal | NA | 9 911,80 | | | | | | | 9 911,80 | | |
| B. Biological treatment of solid waste | | 350,29 | 232,61 | | | | | | 582,90 | | |
| C. Incineration and open burning of waste | NA | 434,82 | 429,45 | | | | | | 864,28 | | |
| D. Waste water treatment and discharge | | 1 775,42 | 816,76 | | | | | | 2 592,18 | | |
| E. Other | NA | 0,46 | NA | | | | | | 0,46 | | |
| **6. Other** ***(as specified in summary 1.A)*** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | | | | | | | | | 26 961,55 | | |
| Aviation | | | | | | | | | 6 584,51 | | |
| Navigation | | | | | | | | | 20 377,04 | | |
| **Multilateral operations** | | | | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | | | | | | | | | 29 737,20 | | |
| **$CO_2$ captured** | | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | | | | | | | | | |
| **Indirect $CO_2$[3]** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 271 506,02 | 90 661,44 | 180 844,58 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 234 894,35 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

CRF1+CRF2: Interannual drop of ETS

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Finland
Geographical scope[4] Finland

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 12 181,43 | 5 168,52 | 6 789,45 | 1 113,13 | 1,93 | 18,21 | NO | NO | 25 272,67 | | |
| **1. Energy** | 33 917,35 | 283,86 | 525,84 | | | | | | 34 727,04 | **16 019,16** | **18 621,48** |
| A. Fuel combustion (sectoral approach) | 33 840,49 | 253,00 | 525,00 | | | | | | 34 618,49 | | |
| 1. Energy industries | 12 490,00 | 25,00 | 219,00 | | | | | | 12 734,00 | | |
| 2. Manufacturing industries and construction | 6 140,00 | 20,00 | 148,00 | | | | | | 6 308,00 | | |
| 3. Transport | 10 344,00 | 12,00 | 86,00 | | | | | | 10 442,00 | | |
| 4. Other sectors | 3 690,00 | 192,00 | 64,00 | | | | | | 3 946,00 | | |
| 5. Other | 1 176,49 | 4,00 | 8,00 | | | | | | 1 188,49 | | |
| B. Fugitive emissions from fuels | 76,86 | 30,86 | 0,84 | | | | | | 108,56 | | |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | | |
| 2. Oil and natural gas | 76,86 | 30,86 | 0,84 | | | | | | 108,56 | | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 3 816,45 | 1,09 | 245,24 | 1 113,13 | 1,93 | 18,21 | NO | NO | 5 196,05 | **3 558,48** | **1 637,57** |
| A. Mineral industry | 939,76 | | | | | | | | 939,76 | | |
| B. Chemical industry | 1 029,30 | 0,93 | 226,53 | NO | NO | NO | NO | NO | 1 256,76 | | |
| C. Metal industry | 1 694,26 | 0,00 | NO | | | NO | | | 1 694,26 | | |
| D. Non-energy products from fuels and solvent use | 153,13 | 0,16 | 0,95 | | | | | | 154,23 | | |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | | |
| F. Product uses as ODS substitutes | | | | 1 111,97 | 0,81 | | | | 1 112,78 | | |
| G. Other product manufacture and use | NO | NO | 17,77 | | NO | 13,72 | | | 31,48 | | |
| H. Other | NO | NO | NO | 1,16 | 1,12 | 4,49 | | | 6,77 | | |
| **3. Agriculture** | 200,18 | 2 520,61 | 3 873,69 | | | | | | 6 594,48 | **0,00** | **6 594,48** |
| A. Enteric fermentation | | 2 063,84 | | | | | | | 2 063,84 | | |
| B. Manure management | | 455,05 | 272,05 | | | | | | 727,10 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 3 601,11 | | | | | | 3 601,11 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 1,71 | 0,53 | | | | | | 2,24 | | |
| G. Liming | 198,03 | | | | | | | | 198,03 | | |
| H. Urea application | 2,15 | | | | | | | | 2,15 | | |
| I. Other carbon-containing fertilizers | NA | | | | | | | | NA | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -25 752,54 | 766,08 | 2 020,90 | | | | | | -22 965,57 | | |
| A. Forest land | -35 288,67 | 692,52 | 1 889,56 | | | | | | -32 706,59 | | |
| B. Cropland | 8 180,75 | IE | 7,78 | | | | | | 8 188,52 | | |
| C. Grassland | 701,15 | 0,02 | 0,73 | | | | | | 701,90 | | |
| D. Wetlands | 2 053,96 | 73,53 | 100,39 | | | | | | 2 227,88 | | |
| E. Settlements | 661,60 | NE | 20,56 | | | | | | 682,16 | | |
| F. Other land | NO | NA | NA | | | | | | NO | | |
| G. Harvested wood products | -2 061,34 | | | | | | | | -2 061,34 | | |
| H. Other | NA | NA | NA | | | | | | NA | | |
| **5. Waste** | NO | 1 596,90 | 123,78 | | | | | | 1 720,67 | **0,00** | **1 720,67** |
| A. Solid waste disposal | NO | 1 353,11 | | | | | | | 1 353,11 | | |
| B. Biological treatment of solid waste | | 78,58 | 49,33 | | | | | | 127,91 | | |
| C. Incineration and open burning of waste | NO | NO | NO | | | | | | NO | | |
| D. Waste water treatment and discharge | | 165,21 | 74,45 | | | | | | 239,66 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 1 857,16 | 2,23 | 13,97 | | | | | | 1 873,35 | | |
| Aviation | 863,66 | 0,11 | 7,03 | | | | | | 870,80 | | |
| Navigation | 993,50 | 2,11 | 6,94 | | | | | | 1 002,55 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 38 878,68 | | | | | | | | 38 878,68 | | |
| **$CO_2$ captured** | 101,51 | | | | | | | | 101,51 | | |
| **Long-term storage of C in waste disposal sites** | 54 622,41 | | | | | | | | 54 622,41 | | |
| **Indirect $N_2O$** | | | 160,22 | | | | | | | | |
| **Indirect $CO_2$[3]** | 51,21 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 48 238,24 | 19 577,64 | 28 574,21 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 25 272,67 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 48 289,45 | **19 577,64** | **28 625,42** |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 25 323,88 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| According to Statistics Finland's instant preliminary data, the total emissions (including indirect CO2) of greenhouse gases in 2020 corresponded with 48.3 million tonnes of carbon dioxide (CO2 eq.). Compared with the previous year, emissions decreased by nine per cent. The fall in emissions was affected by the warm winter, recent changes in the structure of electricity production and a decrease in transport performance. The effect of the covid-19 pandemic on emission reductions is not available from the inventory data, because the amount of emissions was affected not only by exceptional circumstances but also by weather and cyclical fluctuations in industry, but the exceptional conditions were visible as a decrease in transport emissions. Emissions not included in the EU Emissions Trading System fell by three per cent but exceeded the annual emission allocations set by the EU by 0.1 million tonnes of CO2 equivalent.<br><br>Especially the decrease in fellings from the previous year increased the net sink of the LULUCF sector, i.e. land use, land-use change and forestry, which according to the instant preliminary data was -23.0 million tonnes of CO2 eq. Emissions and removals in the LULUCF sector are not included in the total emissions described above.<br><br>For more information, see https://www.stat.fi/til/khki/2020/khki_2020_2021-05-21_tie_001_en.html<br><br>Note 1: The preliminary estimate for transport includes a preliminary estimate also for domestic aviation: 86.39 kt CO2. Please use this estimate when publishing data on emissions trends for EU MS to provide a more accurate estimate for the non-ETS sector emissions.<br>Note 2: In the template the total non-ETS emissions with indirect CO2 cannot be filled in. As the official non-ETS emissions include the indirect emissions, this should be corrected in the template. Our total non-ETS emissions with indirect CO2 are 28 625.42 kt CO2 eq. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country France
Geographical scope[4] UE perimeter of France

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 252 126,76 | 56 879,33 | 41 303,51 | 13 736,08 | 479,28 | 387,37 | 0,00 | 9,44 | 364 921,77 | | |
| **1. Energy** | 256 843,77 | 2 166,26 | 3 086,78 | | | | | | 262 096,81 | **82 108,57** | **179 988,25** |
| A. Fuel combustion (sectoral approach) | 254 706,28 | 1 242,37 | 3 077,17 | | | | | | 259 025,82 | 61 574,95 | **197 450,87** |
| 1. Energy industries | 34 485,28 | 43,31 | 133,23 | | | | | | 34 661,82 | 27 246,96 | **7 414,86** |
| 2. Manufacturing industries and construction | 43 644,05 | 102,96 | 550,31 | | | | | | 44 297,32 | 33 768,24 | **10 529,08** |
| 3. Transport | 108 967,37 | 135,37 | 1 046,74 | | | | | | 110 149,48 | 307,10 | **109 842,38** |
| 4. Other sectors | 67 609,57 | 960,74 | 1 346,89 | | | | | | 69 917,20 | 252,66 | **69 664,55** |
| 5. Other | 0,00 | 0,00 | 0,00 | | | | | | 0,00 | 0,00 | **0,00** |
| B. Fugitive emissions from fuels | 2 137,50 | 923,88 | 9,61 | | | | | | 3 070,99 | 2 126,60 | **944,40** |
| 1. Solid fuels | 0,00 | 14,59 | 0,00 | | | | | | 14,59 | 0,00 | **14,59** |
| 2. Oil and natural gas | 2 137,50 | 909,29 | 9,61 | | | | | | 3 056,40 | 2 126,60 | **929,81** |
| C. $CO_2$ transport and storage | 0,00 | | | | | | | | 0,00 | 0,00 | **0,00** |
| **2. Industrial processes and product use** | 27 106,98 | 62,29 | 834,95 | 13 736,08 | 479,28 | 387,37 | 0,00 | 9,44 | 42 616,40 | **18 407,02** | **24 209,38** |
| A. Mineral industry | 9 379,89 | | | | | | | | 9 379,89 | 8 533,54 | **846,35** |
| B. Chemical industry | 5 867,82 | 34,56 | 699,81 | 136,13 | 4,36 | 0,00 | 0,00 | 0,00 | 6 742,68 | 6 325,73 | **416,94** |
| C. Metal industry | 10 464,01 | 27,53 | 0,00 | 0,00 | 54,38 | 30,55 | 0,00 | 0,00 | 10 576,47 | 3 506,07 | **7 070,40** |
| D. Non-energy products from fuels and solvent use | 958,48 | 0,21 | 1,95 | | | | | | 960,63 | 38,71 | **921,92** |
| E. Electronic Industry | | | | 6,12 | 74,33 | 3,15 | 0,00 | 9,44 | 93,04 | 0,00 | **93,04** |
| F. Product uses as ODS substitutes | | | | 13 593,24 | 0,00 | 0,00 | 0,00 | 0,00 | 13 593,24 | 0,00 | **13 593,24** |
| G. Other product manufacture and use | 436,73 | 0,00 | 133,19 | 0,59 | 346,21 | 353,68 | 0,00 | 0,00 | 1 270,39 | 2,89 | **1 267,50** |
| H. Other | 0,06 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,06 | 0,07 | **-0,01** |
| **3. Agriculture** | 1 938,79 | 37 529,68 | 33 586,69 | | | | | | 73 055,16 | | |
| A. Enteric fermentation | | 33 731,46 | | | | | | | 33 731,46 | | |
| B. Manure management | | 3 727,74 | 2 360,58 | | | | | | 6 088,33 | | |
| C. Rice cultivation | | 39,01 | | | | | | | 39,01 | | |
| D. Agricultural soils | | 0,00 | 31 216,38 | | | | | | 31 216,38 | | |
| E. Prescribed burning of savannas | | 0,00 | 0,00 | | | | | | 0,00 | | |
| F. Field burning of agricultural residues | | 31,47 | 9,73 | | | | | | 41,19 | | |
| G. Liming | 668,64 | | | | | | | | 668,64 | | |
| H. Urea application | 1 270,14 | | | | | | | | 1 270,14 | | |
| I. Other carbon-containing fertilizers | 0,00 | | | | | | | | 0,00 | | |
| J. Other | 0,00 | 0,00 | 0,00 | | | | | | 0,00 | | |
| **4. Land use, land-use change and forestry[1]** | -35 107,02 | 1 192,45 | 3 120,40 | | | | | | -30 794,17 | | |
| A. Forest land | -52 142,59 | 612,51 | 393,32 | | | | | | -51 136,75 | | |
| B. Cropland | 14 202,25 | 113,98 | 1 857,36 | | | | | | 16 173,60 | | |
| C. Grassland | -7 793,46 | 177,88 | 115,10 | | | | | | -7 500,47 | | |
| D. Wetlands | 510,54 | 9,34 | 0,77 | | | | | | 520,64 | | |
| E. Settlements | 10 838,42 | 60,34 | 753,84 | | | | | | 11 652,59 | | |
| F. Other land | 0,00 | 0,00 | 0,00 | | | | | | 0,00 | | |
| G. Harvested wood products | -767,85 | | | | | | | | -767,85 | | |
| H. Other | 45,66 | 218,40 | 0,00 | | | | | | 264,06 | | |
| **5. Waste** | 1 344,23 | 15 928,64 | 674,69 | | | | | | 17 947,56 | | |
| A. Solid waste disposal | 0,00 | 12 521,58 | | | | | | | 12 521,58 | | |
| B. Biological treatment of solid waste | | 1 091,29 | 203,52 | | | | | | 1 294,81 | | |
| C. Incineration and open burning of waste | 1 344,23 | 24,68 | 68,26 | | | | | | 1 437,16 | | |
| D. Waste water treatment and discharge | | 2 291,10 | 402,92 | | | | | | 2 694,02 | | |
| E. Other | 0,00 | 0,00 | 0,00 | | | | | | 0,00 | | |
| **6. Other *(as specified in summary 1.A)*** | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 14 032,14 | 14,19 | 111,18 | | | | | | 14 157,51 | | |
| Aviation | 8 494,04 | 0,89 | 68,89 | | | | | | 8 563,81 | | |
| Navigation | 5 538,10 | 13,30 | 42,29 | | | | | | 5 593,69 | | |
| **Multilateral operations** | 0,86 | | | | | | | | 0,86 | | |
| **$CO_2$ emissions from biomass** | 57 013,10 | | | | | | | | 57 013,10 | | |
| **$CO_2$ captured** | | | | | | | | | 0,00 | | |
| **Long-term storage of C in waste disposal sites** | | | | | | | | | 0,00 | | |
| **Indirect $N_2O$** | | | | | | | | | | | |
| **Indirect $CO_2$[3]** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 395 715,94 | 82 108,57 | 313 607,37 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 364 921,77 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Greece
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 49 986,60 | 9 910,17 | 4 215,12 | 5 900,00 | 158,58 | 5,00 | NO | NO | 70 175,67 | | |
| **1. Energy** | 49 192,00 | 879,87 | 410,52 | | | | | | 50 482,49 | | |
| A. Fuel combustion (sectoral approach) | 49 182,00 | 304,87 | 410,52 | | | | | | 49 897,39 | | |
| 1. Energy industries | 24 350,91 | 7,80 | 73,59 | | | | | | 24 432,30 | 24 094,01 | **338,29** |
| 2. Manufacturing industries and construction | 4 081,09 | 5,85 | 53,23 | | | | | | 4 140,17 | 3 138,36 | **1 001,81** |
| 3. Transport | 15 300,00 | 61,20 | 212,50 | | | | | | 15 573,70 | | **15 573,70** |
| 4. Other sectors | 5 300,00 | 230,00 | 70,00 | | | | | | 5 600,00 | | **5 600,00** |
| 5. Other | 150,00 | 0,02 | 1,20 | | | | | | 151,22 | | **151,22** |
| B. Fugitive emissions from fuels | | | | | | | | | 585,10 | | |
| 1. Solid fuels | NO | 450,00 | NA | | | | | | 450,00 | | **450,00** |
| 2. Oil and natural gas | 10,00 | 125,00 | 0,10 | | | | | | 135,10 | | **135,10** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 4 674,00 | 0,00 | 159,00 | 5 900,00 | 158,58 | 5,00 | NO | NO | 10 896,95 | | |
| A. Mineral industry | 3 390,52 | | | | | | | | 3 390,52 | 3 378,04 | **12,48** |
| B. Chemical industry | 179,76 | | 18,97 | | | | | | 198,74 | 198,74 | |
| C. Metal industry | 978,81 | 0,30 | NO | | 118,58 | | | | 1 097,69 | 912,54 | **185,16** |
| D. Non-energy products from fuels and solvent use | 40,00 | NA | NA | | | | | | 40,00 | | **40,00** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | | |
| F. Product uses as ODS substitutes | | | | 5 900,00 | 40,00 | | | | 5 940,00 | | **5 940,00** |
| G. Other product manufacture and use | 85,00 | NA | 140,00 | | NO | 5,00 | | | 230,00 | | **230,00** |
| H. Other | NA | NA | NA | | | | | | NA | | |
| **3. Agriculture** | 35,00 | 4 430,00 | 3 300,00 | | | | | | 7 765,00 | | |
| A. Enteric fermentation | | 3 600,00 | | | | | | | 3 600,00 | | **3 600,00** |
| B. Manure management | | 640,00 | 290,00 | | | | | | 930,00 | | **930,00** |
| C. Rice cultivation | | 160,00 | | | | | | | 160,00 | | **160,00** |
| D. Agricultural soils | | NE | 3 000,00 | | | | | | 3 000,00 | | **3 000,00** |
| E. Prescribed burning of savannas | | NO | NO | | | | | | | | |
| F. Field burning of agricultural residues | | 30,00 | 10,00 | | | | | | 40,00 | | **40,00** |
| G. Liming | NO | | | | | | | | NO | | |
| H. Urea application | 35,00 | | | | | | | | 35,00 | | **35,00** |
| I. Other carbon-containing fertilizers | NO | | | | | | | | | | |
| J. Other | | | | | | | | | | | |
| **4. Land use, land-use change and forestry[1]** | -3 919,50 | 130,00 | 24,62 | | | | | | -3 764,88 | | |
| A. Forest land | -2 000,00 | 70,00 | 5,30 | | | | | | -1 924,70 | | |
| B. Cropland | -400,00 | NO | 1,30 | | | | | | -398,70 | | |
| C. Grassland | -1 700,00 | 60,00 | 5,00 | | | | | | -1 635,00 | | |
| D. Wetlands | 0,50 | NO | 0,02 | | | | | | 0,52 | | |
| E. Settlements | 130,00 | NO | 7,00 | | | | | | 137,00 | | |
| F. Other land | 80,00 | NO | 6,00 | | | | | | 86,00 | | |
| G. Harvested wood products | -30,00 | | | | | | | | -30,00 | | |
| H. Other | NO | NO | NO | | | | | | | | |
| **5. Waste** | 5,00 | 4 470,00 | 321,00 | | | | | | 4 796,10 | | |
| A. Solid waste disposal | NO | 3 300,00 | | | | | | | 3 300,00 | | **3 300,00** |
| B. Biological treatment of solid waste | | 70,00 | 20,00 | | | | | | 90,00 | | **90,00** |
| C. Incineration and open burning of waste | 5,00 | 0,10 | 1,00 | | | | | | 6,10 | | **6,10** |
| D. Waste water treatment and discharge | | 1 100,00 | 300,00 | | | | | | 1 400,00 | | **1 400,00** |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 9 700,00 | 15,50 | 200,00 | | | | | | 9 915,50 | | |
| Aviation | 2 500,00 | 0,50 | 30,00 | | | | | | 2 530,50 | | |
| Navigation | 7 200,00 | 15,00 | 170,00 | | | | | | 7 385,00 | | |
| **Multilateral operations** | | | | | | | | | | | |
| **$CO_2$ emissions from biomass** | | | | | | | | | | | |
| **$CO_2$ captured** | | | | | | | | | | | |
| **Long-term storage of C in waste disposal sites** | | | | | | | | | | | |
| **Indirect $N_2O$** | | | | | | | | | | | |
| **Indirect $CO_2$[3]** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 73 940,55 | 31 721,69 | 42 218,86 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 70 175,67 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | | | |

[1] For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
[2] See footnote 7 to table Summary 1.A.
[3] In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
[4] Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

The ETS in column L does not include aviation. The emissions from national aviation are included in column M (non-ETS). The estimation of emissions from categories 1 (power sector, refineries and industry) and 2 is based on ETS data. The estimation of emissions from the rest sectors is based on extrapolation of historic emissions and expert judgement.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Croatia
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 17 520,54 | 3 480,61 | 1 634,54 | 556,92 | NA | 5,51 | NA | NA | 23 198,11 | 7 323,81 | 15 874,30 |
| **1. Energy** | 15 432,99 | 493,78 | 217,56 | | | | | | 16 144,33 | **5 335,83** | **10 808,50** |
| A. Fuel combustion (sectoral approach) | 15 205,41 | 336,15 | 217,39 | | | | | | 15 758,94 | 5 335,83 | **10 423,11** |
| 1. Energy industries | 3 621,81 | 9,19 | 23,83 | | | | | | 3 654,83 | 3 490,28 | **164,55** |
| 2. Manufacturing industries and construction | 2 312,10 | 3,83 | 6,69 | | | | | | 2 322,62 | 1 845,56 | **477,07** |
| 3. Transport | 6 634,07 | 9,37 | 68,09 | | | | | | 6 711,53 | NO | **6 711,53** |
| 4. Other sectors | 2 637,42 | 313,76 | 118,78 | | | | | | 3 069,97 | NO | **3 069,97** |
| 5. Other | NO | NO | NO | | | | | | NO | NO | |
| B. Fugitive emissions from fuels | 227,58 | 157,63 | 0,17 | | | | | | 385,39 | NO | **385,39** |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | NO | |
| 2. Oil and natural gas | 227,58 | 157,63 | 0,17 | | | | | | 385,39 | NO | **385,39** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 2 020,32 | NA | 171,31 | 556,92 | NA | 5,51 | NA | NA | 2 754,04 | **1 987,98** | **766,07** |
| A. Mineral industry | 1 359,32 | | | | | | | | 1 359,32 | 1 359,32 | |
| B. Chemical industry | 557,75 | NA | 65,08 | NA | NA | NA | NA | NA | 622,83 | 622,83 | |
| C. Metal industry | 5,84 | NA | NA | NA | NA | NA | NA | NA | 5,84 | 5,84 | |
| D. Non-energy products from fuels and solvent use | 97,42 | NA | NA | | | | | | 97,42 | NO | **97,42** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | |
| F. Product uses as ODS substitutes | | | | 556,92 | NO | NA | NA | NA | 556,92 | NO | **556,92** |
| G. Other product manufacture and use | NA | NA | 106,23 | NA | NA | 5,51 | NA | NA | 111,73 | NO | **111,73** |
| H. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | NO | |
| **3. Agriculture** | 67,23 | 1 363,92 | 1 149,83 | | | | | | 2 580,99 | | |
| A. Enteric fermentation | | 985,82 | | | | | | | 985,82 | | |
| B. Manure management | | 378,10 | 144,78 | | | | | | 522,88 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 1 005,06 | | | | | | 1 005,06 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 2,90 | | | | | | | | 2,90 | | |
| H. Urea application | 64,34 | | | | | | | | 64,34 | | |
| I. Other carbon-containing fertilizers | NA | | | | | | | | NA | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NE | NE | | | | | | NE | | |
| E. Settlements | NE | NE | NE | | | | | | NE | | |
| F. Other land | NE | NE | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NE | NE | NE | | | | | | NE | | |
| **5. Waste** | NO | 1 622,91 | 95,84 | | | | | | 1 718,75 | | |
| A. Solid waste disposal | NA | 1 184,10 | | | | | | | 1 184,10 | | |
| B. Biological treatment of solid waste | | 5,37 | 3,84 | | | | | | 9,21 | | |
| C. Incineration and open burning of waste | NO | NA | NA | | | | | | NO | | |
| D. Waste water treatment and discharge | | 433,44 | 92,00 | | | | | | 525,44 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 683,77 | 0,29 | 5,60 | | | | | | 689,66 | | |
| Aviation | 605,86 | 0,10 | 4,98 | | | | | | 610,95 | | |
| Navigation | 77,91 | 0,18 | 0,62 | | | | | | 78,72 | | |
| **Multilateral operations** | C | C | C | | | | | | C | | |
| **$CO_2$ emissions from biomass** | 6 228,14 | | | | | | | | 6 228,14 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | 504,93 | | | | | | | | 504,93 | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23 198,11 | 7 323,81 | 15 874,30 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

[1] For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
[2] See footnote 7 to table Summary 1.A.
[3] In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
[4] Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

2.D.1; 2.D.2; 2.D.3 - non-ETS: CO2 emission is assessed by extrapolation, according to emissions trend from 2015 to 2019, due to the lack of recent data.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Hungary
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | |
| **1. Energy** | 42 752,46 | 2 221,07 | 332,16 | | | | | | 45 305,69 | **14 086,65** | **31 219,05** |
| A. Fuel combustion (sectoral approach) | 42 591,60 | 537,91 | 331,90 | | | | | | 43 461,42 | 14 040,77 | **29 420,65** |
| 1. Energy industries | 12 112,86 | 24,04 | 53,65 | | | | | | 12 190,54 | 11 699,49 | **491,05** |
| 2. Manufacturing industries and construction | 4 751,62 | 12,68 | 29,38 | | | | | | 4 793,68 | 2 217,07 | **2 576,61** |
| 3. Transport | 13 686,13 | 22,58 | 155,24 | | | | | | 13 863,95 | 114,55 | **13 749,41** |
| 4. Other sectors | 11 976,38 | 478,52 | 93,40 | | | | | | 12 548,30 | 9,66 | **12 538,64** |
| 5. Other | 64,62 | 0,09 | 0,23 | | | | | | 64,94 | 0,00 | **64,94** |
| B. Fugitive emissions from fuels | 160,86 | 1 683,16 | 0,26 | | | | | | 1 844,27 | 45,88 | **1 798,40** |
| 1. Solid fuels | 28,67 | 31,74 | 0,00 | | | | | | 60,41 | 28,67 | **31,74** |
| 2. Oil and natural gas | 132,19 | 1 651,42 | 0,26 | | | | | | 1 783,87 | 17,21 | **1 766,66** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 5 067,04 | 49,66 | 203,67 | 2 177,15 | 3,25 | 108,04 | NO | NO | 7 608,82 | **4 821,25** | **2 787,57** |
| A. Mineral industry | 1 308,90 | | | | | | | | 1 308,90 | 1 306,05 | **2,85** |
| B. Chemical industry | 2 584,65 | 45,38 | 32,97 | NO | NO | NO | NO | NO | 2 662,99 | 2 439,16 | **223,83** |
| C. Metal industry | 1 076,03 | 4,29 | NO | NO | NO | NO | NO | NO | 1 080,32 | 1 076,03 | **4,29** |
| D. Non-energy products from fuels and solvent use | 97,46 | NO | NO | | | | | | 97,46 | 0,00 | **97,46** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| F. Product uses as ODS substitutes | | | | 2 177,15 | 3,25 | NO | NO | NO | 2 180,40 | 0,00 | **2 180,40** |
| G. Other product manufacture and use | NO | NO | 170,71 | NO | NO | 108,04 | NO | NO | 278,74 | 0,00 | **278,74** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 242,13 | 2 750,21 | 4 317,99 | | | | | | 7 310,33 | | |
| A. Enteric fermentation | | 2 071,36 | | | | | | | 2 071,36 | | |
| B. Manure management | | 658,43 | 459,62 | | | | | | 1 118,05 | | |
| C. Rice cultivation | | 20,16 | | | | | | | 20,16 | | |
| D. Agricultural soils | | NA | 3 858,30 | | | | | | 3 858,30 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 0,25 | 0,08 | | | | | | 0,33 | | |
| G. Liming | 8,26 | | | | | | | | 8,26 | | |
| H. Urea application | 136,37 | | | | | | | | 136,37 | | |
| I. Other carbon-containing fertilizers | 97,50 | | | | | | | | 97,50 | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NO | NE | | | | | | NE | | |
| E. Settlements | NE | NO | NE | | | | | | NE | | |
| F. Other land | NE | NO | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NA | NA | NA | | | | | | NE | | |
| **5. Waste** | 28,46 | 3 178,54 | 125,25 | | | | | | 3 332,25 | | |
| A. Solid waste disposal | NO | 2 814,19 | | | | | | | 2 814,19 | | |
| B. Biological treatment of solid waste | | 117,95 | 45,26 | | | | | | 163,21 | | |
| C. Incineration and open burning of waste | 28,46 | 0,11 | 0,46 | | | | | | 29,02 | | |
| D. Waste water treatment and discharge | | 246,30 | 79,53 | | | | | | 325,83 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 330,43 | 0,06 | 2,71 | | | | | | 333,19 | | |
| Aviation | 330,43 | 0,06 | 2,71 | | | | | | 333,19 | | |
| Navigation | NO | NO | NO | | | | | | NO | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 10 937,22 | | | | | | | | 10 937,22 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 63 557,09 | 18 907,89 | 44 649,20 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2022
Country Ireland
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 38 351,40 | 15 371,00 | 7 290,85 | 756,81 | 64,51 | 29,85 | NO | 1,38 | 61 865,80 | 13 274,92 | 48 590,88 |
| **1. Energy** | 32 310,99 | 250,78 | 336,30 | | | | | | 32 898,06 | **11 367,76** | **21 530,31** |
| A. Fuel combustion (sectoral approach) | 32 310,67 | 173,32 | 336,30 | | | | | | 32 820,29 | 11 367,76 | **21 452,54** |
| 1. Energy industries | 8 478,52 | 10,74 | 123,78 | | | | | | 8 613,04 | 7 918,84 | **694,19** |
| 2. Manufacturing industries and construction | 4 485,56 | 7,63 | 12,78 | | | | | | 4 505,97 | 3 380,01 | **1 125,96** |
| 3. Transport | 10 165,00 | 7,98 | 121,90 | | | | | | 10 294,88 | 17,25 | **10 277,63** |
| 4. Other sectors | 9 181,60 | 146,97 | 77,84 | | | | | | 9 406,41 | 51,65 | **9 354,76** |
| 5. Other | IE | IE | IE | | | | | | IE | | |
| B. Fugitive emissions from fuels | 0,32 | 77,45 | 0,00 | | | | | | 77,77 | | **77,77** |
| 1. Solid fuels | NO | 18,05 | NO | | | | | | 18,05 | | **18,05** |
| 2. Oil and natural gas | 0,32 | 59,40 | 0,00 | | | | | | 59,72 | | **59,72** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 2 077,09 | NO | 44,50 | 756,81 | 64,51 | 29,85 | NO | 1,38 | 2 974,13 | **1 907,16** | **1 066,97** |
| A. Mineral industry | 1 907,16 | | | | | | | | 1 907,16 | 1 907,16 | **0,00** |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| C. Metal industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| D. Non-energy products from fuels and solvent use | 169,92 | NO | NO | | | | | | 169,92 | | **169,92** |
| E. Electronic Industry | | | | 756,81 | 64,51 | 23,47 | NO | 1,38 | 846,17 | | **846,17** |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | 0,00 | | **0,00** |
| G. Other product manufacture and use | NO | NO | 44,50 | NO | NO | 6,38 | NO | NO | 50,88 | | **50,88** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 505,95 | 13 910,74 | 6 375,11 | | | | | | 20 791,79 | | |
| A. Enteric fermentation | | 12 311,65 | | | | | | | 12 311,65 | | |
| B. Manure management | | 1 599,09 | 605,09 | | | | | | 2 204,18 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 5 770,02 | | | | | | 5 770,02 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 399,48 | | | | | | | | 399,48 | | |
| H. Urea application | 106,47 | | | | | | | | 106,47 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | 3 425,40 | 461,32 | 416,04 | | | | | | 4 302,77 | | |
| A. Forest land | -4 685,45 | 80,24 | 185,49 | | | | | | -4 419,73 | | |
| B. Cropland | -113,69 | 0,01 | 0,00 | | | | | | -113,69 | | |
| C. Grassland | 6 890,29 | 258,71 | 120,24 | | | | | | 7 269,24 | | |
| D. Wetlands | 2 295,65 | 122,37 | 28,91 | | | | | | 2 446,93 | | |
| E. Settlements | 143,54 | NO | 81,40 | | | | | | 224,94 | | |
| F. Other land | NO | NO | NO | | | | | | 0,00 | | |
| G. Harvested wood products | -1 104,93 | | | | | | | | -1 104,93 | | |
| H. Other | NO | NO | NO | | | | | | | | |
| **5. Waste** | 31,97 | 748,17 | 118,91 | | | | | | 899,04 | | |
| A. Solid waste disposal | NO | 667,94 | | | | | | | 667,94 | | |
| B. Biological treatment of solid waste | | 26,87 | 17,50 | | | | | | 44,37 | | |
| C. Incineration and open burning of waste | 31,97 | 0,22 | 0,34 | | | | | | 32,53 | | |
| D. Waste water treatment and discharge | | 53,14 | 101,07 | | | | | | 154,21 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 1 661,25 | 1,32 | 13,46 | | | | | | 1 676,03 | | |
| Aviation | 1 184,50 | 0,18 | 9,60 | | | | | | 1 194,28 | | |
| Navigation | 476,75 | 1,14 | 3,87 | | | | | | 481,76 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 811,20 | | | | | | | | 811,20 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 57 563,04 | 13 274,92 | 44 288,12 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 61 865,80 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 57 563,04 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 61 865,80 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

The draft national total for Ireland's 2020 greenhouse gas emissions is 57.56 Mt of CO2eq. This is a decrease of 2.25 Mt of CO2eq. or 3.8% on the latest 2019 estimate of 59.81 Mt of CO2eq.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Italy
Geographical scope[4] Italy

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt ) | | | | | | | | | CO2 equivalent (Gg ) | |
| **Total (net emissions)[1]** | 269 758,11 | 42 040,01 | 17 529,78 | 16 626,94 | 1 648,29 | 345,14 | 23,54 | 11,91 | 347 983,71 | | |
| **1. Energy** | 290 792,03 | 7 609,66 | 4 395,04 | | | | | | 302 796,73 | **112 700,20** | **190 096,53** |
| A. Fuel combustion (sectoral approach) | 288 049,09 | 2 892,25 | 4 385,84 | | | | | | 295 327,18 | 110 545,28 | **184 781,90** |
| 1. Energy industries | 81 160,81 | 119,49 | 330,00 | | | | | | 81 610,30 | 78 752,15 | **2 858,14** |
| 2. Manufacturing industries and construction | 44 872,70 | 272,35 | 683,55 | | | | | | 45 828,61 | 30 519,48 | **15 309,13** |
| 3. Transport | 86 047,65 | 173,42 | 882,58 | | | | | | 87 103,65 | 548,46 | **86 555,19** |
| 4. Other sectors | 75 342,75 | 2 325,01 | 2 474,97 | | | | | | 80 142,72 | 725,18 | **79 417,54** |
| 5. Other | 625,18 | 1,98 | 14,74 | | | | | | 641,90 | | **641,90** |
| B. Fugitive emissions from fuels | 2 742,94 | 4 717,41 | 9,20 | | | | | | 7 469,55 | 2 154,92 | **5 314,63** |
| 1. Solid fuels | | 31,99 | | | | | | | 31,99 | | **31,99** |
| 2. Oil and natural gas | 2 742,94 | 4 685,41 | 9,20 | | | | | | 7 437,56 | 2 154,92 | **5 282,64** |
| C. $CO_2$ transport and storage | | | | | | | | | | | |
| **2. Industrial processes and product use** | 13 739,69 | 34,09 | 639,10 | 16 626,94 | 1 648,29 | 345,14 | 23,54 | 11,91 | 33 068,70 | **13 319,86** | **19 748,83** |
| A. Mineral industry | 9 857,34 | | | | | | | | 9 857,34 | 9 570,53 | **286,81** |
| B. Chemical industry | 1 374,89 | 3,56 | 119,32 | 0,98 | 1 478,00 | | | | 2 976,74 | 2 249,93 | **726,80** |
| C. Metal industry | 1 361,42 | 30,53 | | 5,72 | | | | | 1 397,67 | 1 397,67 | |
| D. Non-energy products from fuels and solvent use | 1 146,05 | | | | | | | | 1 146,05 | 101,73 | **1 044,31** |
| E. Electronic Industry | | | | 8,77 | 170,29 | 58,70 | 23,54 | 11,91 | 273,21 | | **273,21** |
| F. Product uses as ODS substitutes | | | | 8,77 | | | | | 16 611,47 | | **16 611,47** |
| G. Other product manufacture and use | | | | | | 286,44 | | | 806,22 | | **806,22** |
| H. Other | | | | | | | | | | | |
| **3. Agriculture** | 429,58 | 18 580,15 | 10 116,83 | | | | | | 29 126,56 | | **29 126,56** |
| A. Enteric fermentation | | 12 720,78 | | | | | | | 12 720,78 | | **12 720,78** |
| B. Manure management | | 4 137,14 | 2 094,21 | | | | | | 6 231,35 | | **6 231,35** |
| C. Rice cultivation | | 1 707,32 | | | | | | | 1 707,32 | | **1 707,32** |
| D. Agricultural soils | | | 8 018,77 | | | | | | 8 018,77 | | **8 018,77** |
| E. Prescribed burning of savannas | | | | | | | | | | | |
| F. Field burning of agricultural residues | | 14,90 | 3,85 | | | | | | 18,75 | | **18,75** |
| G. Liming | 16,24 | | | | | | | | 16,24 | | **16,24** |
| H. Urea application | 396,45 | | | | | | | | 396,45 | | **396,45** |
| I. Other carbon-containing fertilizers | 16,88 | | | | | | | | 16,88 | | **16,88** |
| J. Other | | | | | | | | | | | |
| **4. Land use, land-use change and forestry[1]** | -35 258,25 | 429,37 | 473,00 | | | | | | -34 355,88 | | **-34 355,88** |
| A. Forest land | -35 172,75 | 340,85 | 0,19 | | | | | | -34 831,71 | | **-34 831,71** |
| B. Cropland | 3 409,21 | 2,59 | 48,91 | | | | | | 3 460,71 | | **3 460,71** |
| C. Grassland | -7 868,88 | 85,93 | 21,65 | | | | | | -7 761,30 | | **-7 761,30** |
| D. Wetlands | | | | | | | | | | | |
| E. Settlements | 5 008,36 | | 231,39 | | | | | | 5 239,75 | | **5 239,75** |
| F. Other land | | | | | | | | | | | |
| G. Harvested wood products | -634,20 | | | | | | | | -634,20 | | **-634,20** |
| H. Other | | | | | | | | | | | |
| **5. Waste** | 55,05 | 15 386,74 | 1 905,81 | | | | | | 17 347,61 | | **17 347,61** |
| A. Solid waste disposal | | 12 747,62 | | | | | | | 12 747,62 | | **12 747,62** |
| B. Biological treatment of solid waste | | 126,60 | 546,11 | | | | | | 672,71 | | **672,71** |
| C. Incineration and open burning of waste | 55,05 | 55,88 | 19,03 | | | | | | 129,97 | | **129,97** |
| D. Waste water treatment and discharge | | 2 456,64 | 1 340,67 | | | | | | 3 797,31 | | **3 797,31** |
| E. Other | | | | | | | | | | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | | | | | | | | | 10 196,55 | | **10 196,55** |
| Aviation | | | | | | | | | 4 217,34 | | **4 217,34** |
| Navigation | | | | | | | | | 5 979,21 | | **5 979,21** |
| **Multilateral operations** | | | | | | | | | | | |
| **$CO_2$ emissions from biomass** | | | | | | | | | 44 908,79 | | **44 908,79** |
| **$CO_2$ captured** | | | | | | | | | | | |
| **Long-term storage of C in waste disposal sites** | | | | | | | | | | | |
| **Indirect $N_2O$** | | | | | | | | | | | |
| **Indirect $CO_2$[3]** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 382 339,60 | 126 020,06 | 256 319,54 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 347 983,71 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 382 339,60 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 347 983,71 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

Approximated total national emissions for 2020

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Lithuania
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 8 661,70 | 2 846,75 | 3 194,09 | 498,03 | NO | 4,66 | NO | NO | 15 205,24 | 6 137,66 | 13 895,11 |
| **1. Energy** | 11 219,67 | 438,98 | 162,04 | | | | | | 11 820,70 | **3 335,99** | **8 483,01** |
| A. Fuel combustion (sectoral approach) | 11 039,90 | 188,26 | 162,04 | | | | | | 11 390,19 | 3 156,22 | **8 232,28** |
| 1. Energy industries | 2 589,64 | 24,39 | 38,87 | | | | | | 2 652,90 | 2 512,90 | **140,00** |
| 2. Manufacturing industries and construction | 1 169,33 | 5,33 | 13,33 | | | | | | 1 187,99 | 636,87 | **551,12** |
| 3. Transport | 6 064,91 | 6,23 | 69,76 | | | | | | 6 140,90 | 2,51 | **6 136,71** |
| 4. Other sectors | 1 186,78 | 152,30 | 39,82 | | | | | | 1 378,91 | 3,94 | **1 374,96** |
| 5. Other | 29,24 | 0,01 | 0,24 | | | | | | 29,49 | NA | **29,49** |
| B. Fugitive emissions from fuels | 179,78 | 250,73 | NO | | | | | | 430,50 | 179,77 | **250,73** |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | NA | |
| 2. Oil and natural gas | 179,78 | 250,73 | NO | | | | | | 430,50 | 179,77 | **250,73** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 2 426,17 | NO | 158,27 | 498,03 | NO | 4,66 | NO | NO | 3 087,14 | **2 801,67** | **285,47** |
| A. Mineral industry | 579,47 | | | | | | | | 579,47 | 576,55 | **2,92** |
| B. Chemical industry | 1 791,85 | NO | 154,88 | NO | NO | NO | NO | NO | 1 946,73 | 2 225,11 | **-278,38** |
| C. Metal industry | 0,04 | NO | NO | NO | NO | NO | NO | NO | 0,04 | NO | **0,04** |
| D. Non-energy products from fuels and solvent use | 54,81 | NO | NO | | | | | | 54,81 | NO | **54,81** |
| E. Electronic Industry | | | | NO | NO | 4,46 | NO | NO | 4,46 | NO | **4,46** |
| F. Product uses as ODS substitutes | | | | 498,03 | NO | NO | NO | NO | 498,03 | NO | **498,03** |
| G. Other product manufacture and use | NO | NO | 3,38 | NO | NO | 0,21 | NO | NO | 3,59 | NO | **3,59** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 23,48 | 1 671,38 | 2 626,11 | | | | | | 4 320,97 | | |
| A. Enteric fermentation | | 1 436,12 | | | | | | | 1 436,12 | | |
| B. Manure management | | 235,26 | 178,62 | | | | | | 413,88 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 2 447,49 | | | | | | 2 447,49 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 7,02 | | | | | | | | 7,02 | | |
| H. Urea application | 16,46 | | | | | | | | 16,46 | | |
| I. Other carbon-containing fertilizers | NE | | | | | | | | NE | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -5 009,59 | 1,10 | 179,27 | | | | | | -4 829,22 | | |
| A. Forest land | -5 958,73 | 0,53 | 31,93 | | | | | | -5 926,27 | | |
| B. Cropland | 710,20 | 0,00 | 58,90 | | | | | | 769,11 | | |
| C. Grassland | -821,60 | 0,57 | 0,86 | | | | | | -820,17 | | |
| D. Wetlands | 816,72 | NO | 0,00 | | | | | | 816,73 | | |
| E. Settlements | 685,85 | NO | 61,13 | | | | | | 746,99 | | |
| F. Other land | 342,42 | NO | 26,45 | | | | | | 368,86 | | |
| G. Harvested wood products | -784,46 | | | | | | | | -784,46 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 1,96 | 735,29 | 68,40 | | | | | | 805,65 | | |
| A. Solid waste disposal | NO | 555,38 | | | | | | | 555,38 | | |
| B. Biological treatment of solid waste | | 64,18 | 25,81 | | | | | | 89,99 | | |
| C. Incineration and open burning of waste | 1,96 | 0,00 | 0,06 | | | | | | 2,02 | | |
| D. Waste water treatment and discharge | | 115,73 | 42,53 | | | | | | 158,26 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 742,54 | 1,37 | 5,90 | | | | | | 749,80 | | |
| Aviation | 161,20 | 0,03 | 1,34 | | | | | | 162,57 | | |
| Navigation | 581,34 | 1,34 | 4,56 | | | | | | 587,23 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 5 990,73 | | | | | | | | 5 990,73 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | 3 913,16 | | | | | | | | 3 913,16 | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 20 034,46 | 6 137,66 | 13 895,11 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 15 205,24 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| 1. Energy. Although GHG emissions increased in energy industries subsector, they were compensated by decreases in all other energy subsectors in 2020. This happened mainly because Elektrenai thermal power plant was producing electricity under standard conditions after a few years break. A decrease of GHG emissions in manufacturing industries was influenced by decreased coal consumption in cement production, the decrease in transport was observed due to the decreased diesel oil consumption in road transport where higher share of biodiesel in diesel oil played a big role together with decreased mobility due to COVID-19 pandemic. A reduction of coal consumption is observed in commercial/institutional and residential sectors, and the GHG reduction in fugitive emissions is influenced by decreased hydrogen production in petroleum refinery and decreased natural gas leakages in natural gas transmission system.<br>2. IPPU. Emissions from IPPU sector in 2020 have decreased by 9,5% compared to 2019 due to decrease of production in mineral and chemical industry and due to decrease of F-gases consumption ir Commercial and Industrial Refrigeration.<br>3. Agriculture. Emissions from agriculture sector in 2020 have increased by 1% compared to 2019. Emissions from enteric fermentation and manure management has decreased due to decrease in livestock population which are responsible for the biggest share of agriculture emissions from these categories. Increase of agriculture soils emissions is related mainly to the increase of inorganic N fertilizer consumption and increase of crop harvest and area harvested. Despite that emission from livestock in 2020 has decreased, overall emissions from agriculture has increased due to agriculture soils.<br>4. LULUCF. Decrease of GHG removals in LULUCF sector are mainly determined by decreasing GHG removals in forest land. Reduced GHG removals in forest land results from lower growing stock volume change compared to the previous year, which might be affected by natural/climatic factors.<br>5. Waste. Emissions from waste sector in 2020 have decreased by 2% compared to 2019. The decrease is mainly due to the reduction of disposed of waste in landfills and the increase in the number of people connected to centralized sewerage networks. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Luxembourg
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 8 263,12 | 583,90 | 321,45 | 61,24 | NA | 10,79 | NA | NA | 9 240,50 | 1 376,50 | 7 864,00 |
| **1. Energy** | 7 686,75 | 48,65 | 74,38 | | | | | | 7 809,79 | **846,22** | **6 963,57** |
| A. Fuel combustion (sectoral approach) | 7 686,72 | 20,37 | 74,38 | | | | | | 7 781,47 | 846,22 | **6 935,25** |
| 1. Energy industries | 212,35 | 4,94 | 7,83 | | | | | | 225,11 | 47,85 | **177,27** |
| 2. Manufacturing industries and construction | 1 076,51 | 2,32 | 9,72 | | | | | | 1 088,55 | 798,37 | **290,18** |
| 3. Transport | 4 775,04 | 2,89 | 52,49 | | | | | | 4 830,42 | NA | **4 830,42** |
| 4. Other sectors | 1 622,71 | 10,21 | 4,34 | | | | | | 1 637,26 | NA | **1 637,26** |
| 5. Other | 0,11 | 0,00 | 0,00 | | | | | | 0,12 | NA | **0,12** |
| B. Fugitive emissions from fuels | 0,04 | 28,28 | NA | | | | | | 28,32 | NA | **28,32** |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | NO | |
| 2. Oil and natural gas | 0,04 | 28,28 | NA | | | | | | 28,32 | NA | **28,32** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 560,97 | NA | 4,87 | 61,24 | NA | 10,79 | NA | NA | 637,87 | **530,28** | **107,59** |
| A. Mineral industry | 433,48 | | | | | | | | 433,48 | 433,48 | |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| C. Metal industry | 96,80 | NA | NA | NA | NA | NA | NA | NA | 96,80 | 96,80 | |
| D. Non-energy products from fuels and solvent use | 30,68 | NA | NA | | | | | | 30,68 | NA | **30,68** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | |
| F. Product uses as ODS substitutes | | | | 58,18 | NO | NO | NO | NO | 58,18 | NA | **58,18** |
| G. Other product manufacture and use | NO | NO | 4,87 | 3,07 | NO | 10,79 | NO | NO | 18,72 | NA | **18,72** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 15,40 | 468,59 | 231,81 | | | | | | 715,81 | | |
| A. Enteric fermentation | | 405,50 | | | | | | | 405,50 | | |
| B. Manure management | | 63,09 | 27,17 | | | | | | 90,27 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 204,64 | | | | | | 204,64 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 11,28 | | | | | | | | 11,28 | | |
| H. Urea application | 0,00 | | | | | | | | 0,00 | | |
| I. Other carbon-containing fertilizers | 4,12 | | | | | | | | 4,12 | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -442,93 | NO | 9,95 | | | | | | -432,98 | | |
| A. Forest land | -481,52 | NO | NO | | | | | | -481,52 | | |
| B. Cropland | 13,59 | NO | 3,80 | | | | | | 17,39 | | |
| C. Grassland | -41,19 | NO | 0,11 | | | | | | -41,08 | | |
| D. Wetlands | 2,68 | NO | 0,29 | | | | | | 2,96 | | |
| E. Settlements | 56,72 | NO | 5,75 | | | | | | 62,47 | | |
| F. Other land | 0,06 | NO | 0,01 | | | | | | 0,06 | | |
| G. Harvested wood products | 6,73 | | | | | | | | 6,73 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | NA | 66,66 | 10,38 | | | | | | 77,04 | | |
| A. Solid waste disposal | NA | 44,51 | | | | | | | 44,51 | | |
| B. Biological treatment of solid waste | | 20,24 | 5,53 | | | | | | 25,77 | | |
| C. Incineration and open burning of waste | IE | IE | IE | | | | | | IE | | |
| D. Waste water treatment and discharge | | 1,91 | 4,86 | | | | | | 6,76 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | NE | NE | NE | | | | | | NE | | |
| Navigation | NE | NE | NE | | | | | | NE | | |
| **Multilateral operations** | NE | NE | NE | | | | | | NE | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 9 240,50 | 1 376,50 | 7 864,00 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 8 807,52 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| Approximated GHG emissions for 2020 excl. LULUCF are 14.00% lower than the corresponding inventory emissions for 2019. The key drivers for the decrease in GHG emissions in 2020 compared to 2019 are:<br>- reduced gaseous and solid fuel consumption in the 1A2f sector (-45.61 Gg CO2 eq. or -10.84% compared to 2019);<br>- reduced liquid fuel consumption in the 1A3b sector (-1334.34 Gg CO2 eq. or -21.67% compared to 2019);<br>- reduced gaseous fuel consumption in the 1A4a sector (-100.87 Gg CO2 eq. or -14.56% compared to 2019);<br>- reduced industrial activity, mostly in the 2A and 2C sectors (-34.47 Gg CO2 or -6.10% compared to 2019).<br><br>All reductions are a consequence of the COVID-19 pandemic.<br><br>PS: non-ETS emissions are not equal to ESR emissions which equals 7863.55 Gg CO2e (1A3e CO2 is 0.45 Gg CO2e). |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 1
Country Latvia
Geographical scope[4] Latvia

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 6 993,18 | 1 732,26 | 1 462,42 | 254,52 | NA | 11,56 | NA | NA | 10 453,94 | 2 021,98 | 8 431,96 |
| **1. Energy** | 6 308,24 | 284,48 | 184,10 | | | | | | 6 776,82 | **1 436,29** | **5 340,53** |
| A. Fuel combustion (sectoral approach) | 6 308,23 | 186,52 | 184,10 | | | | | | 6 678,85 | 1 436,29 | **5 242,56** |
| 1. Energy industries | 1 326,38 | 15,27 | 24,06 | | | | | | 1 365,72 | 1 100,67 | **265,04** |
| 2. Manufacturing industries and construction | 601,49 | 15,01 | 37,06 | | | | | | 653,56 | 317,99 | **335,56** |
| 3. Transport | 3 063,61 | 3,12 | 37,40 | | | | | | 3 104,13 | NA | **3 104,13** |
| 4. Other sectors | 1 297,84 | 153,08 | 85,43 | | | | | | 1 536,35 | 17,62 | **1 518,72** |
| 5. Other | 18,91 | 0,04 | 0,15 | | | | | | 19,10 | NO | **19,10** |
| B. Fugitive emissions from fuels | 0,01 | 97,96 | NA | | | | | | 97,97 | NO | **97,97** |
| 1. Solid fuels | NO | NO | NA | | | | | | NA | NO | |
| 2. Oil and natural gas | 0,01 | 97,96 | NO | | | | | | 97,97 | NA | **97,97** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 612,79 | NA | 4,37 | 254,52 | NA | 11,56 | NA | NA | 883,24 | **585,69** | **297,55** |
| A. Mineral industry | 567,98 | | | | | | | | 567,98 | 585,69 | |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NA | NA | |
| C. Metal industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| D. Non-energy products from fuels and solvent use | 44,81 | NO | NO | | | | | | 44,81 | NA | **44,81** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | |
| F. Product uses as ODS substitutes | | | | 254,52 | NO | NO | NO | NO | 254,52 | NA | **254,52** |
| G. Other product manufacture and use | NO | NO | 4,37 | NO | NO | 11,56 | NO | NO | 15,93 | NO | **15,93** |
| H. Other | NO | NO | NO | NA | NA | NA | NA | NA | NA | NA | |
| **3. Agriculture** | 72,11 | 945,10 | 1 223,01 | | | | | | 2 240,22 | | |
| A. Enteric fermentation | | 850,98 | | | | | | | 850,98 | | |
| B. Manure management | | 94,12 | 77,74 | | | | | | 171,86 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 1 145,27 | | | | | | 1 145,27 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 61,87 | | | | | | | | 61,87 | | |
| H. Urea application | 10,24 | | | | | | | | 10,24 | | |
| I. Other carbon-containing fertilizers | NE | | | | | | | | NE | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NE | NE | | | | | | NE | | |
| E. Settlements | NE | NE | NE | | | | | | NE | | |
| F. Other land | NE | NE | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NE | NE | NE | | | | | | NE | | |
| **5. Waste** | 0,04 | 502,68 | 50,94 | | | | | | 553,67 | | |
| A. Solid waste disposal | NA | 378,72 | | | | | | | 378,72 | | |
| B. Biological treatment of solid waste | | 43,50 | 18,69 | | | | | | 62,19 | | |
| C. Incineration and open burning of waste | 0,04 | NA | 0,00 | | | | | | 0,04 | | |
| D. Waste water treatment and discharge | | 80,47 | 32,25 | | | | | | 112,72 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 826,38 | 0,88 | 78,18 | | | | | | 905,44 | | |
| Aviation | 178,03 | 0,01 | 1,75 | | | | | | 179,79 | | |
| Navigation | 648,35 | 0,87 | 76,43 | | | | | | 725,65 | | |
| **Multilateral operations** | NA | NA | NA | | | | | | NA | | |
| **$CO_2$ emissions from biomass** | 6 775,60 | | | | | | | | 6 775,60 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NA | | | | | | | | NA | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | 12,31 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 10 453,94 | 2 021,98 | 8 431,96 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 10 466,25 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
|---|
| General. Latvia`s approximate GHG emissions for 2020 were estimated using available activity data from Central Statististical Bureau of Latvia, annual GHG reports under EU ETS and data from national databases or extrapolation in cases activity data were not available yet. In sectors where stable trend was not observed the emissions were left in 2019 level. Compared to previous inventory (GHG inventory submission to UNFCCC on 13th of April 2021) Latvia`s total GHG emissions excluding LULUCF, including indirect CO2 have decreased by 6.1% in 2020. Under 2A1 (Cement production) two different CO2 emission calculation approaches are used. Under EU ETS clinker producer uses Monitoring reporting Regulation (COMMISSION REGULATION (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council) to calculate CO2 emissions from clinker and cement kiln dust using default EFs, but for GHG inventory CO2 emissions are calculated according to 2006 IPCC Guidelines and EFs are calculated using plant specific data. This results in 3.1% (18 kt CO2 eq) difference between ETS CO2 emissions from clinker production reported under Article 21 of the ETS directive (column L) and GHG inventory (column J) calculated in 2020. Very minor differences occur also for glass production due to the same reason and rounding.<br>Energy. Total GHG emissions in Energy sector (excluding Transport) have decreased by 11.0% in 2020 in comparison with 2019. In 2020 emissions in sector 1A1 Energy Industries have decreased by 25.1% compared to 2019 due to decrease use of natural gas in sector (-25.1%) as well as decrease in other fuel use in sector. In sector 1A2 Manufacturing Industries and Construction emissions have decreased by 3.2% in comparison with 2019. In 2020 use of all fuels have decreased with exception of biomass and other fossil fuels where slight increase can be seen. In 2020 emissions in sector 1A4 Other Sectors have increased by 2.1% compared to 2019.In 2020 use of liquid fuels and other fossil fuels have increased, but use of other fuels have decreased.<br>Transport. Total transport emissions in 2020 have fallen by 6% compared to 2019. The largest reduction is found on the railway, where emissions are 41% lower in 2020 than in 2019. Emissions in road transport have fallen by about 5.1%. The steepest decline in emissions in 2020 has been recorded in international aviation. In that sector, emissions fell by about 63% against 2019. The COVID-19 pandemic had a significant impact on mobility opportunities and was therefore a key factor in the reduction of emissions in international aviation and road transport. Other factors also affected the railways.<br>IPPU. Emissions from IPPU sector in 2020 are decreased by 0.9% compared to 2019 due to a small decrease of emissions in all subsectors. The only lime production company stopped lime production from dolomite since 2016 thus CO2 emissions from 2.A.2 are NO. The same for the only iron and steel plant which didn`t produce steel anymore but only rolls armature not causing CO2 emissions thus CO2 and CH4 emissions from 2.C.1 are NO.<br>F-gases Activity data from annual F-gases reports for proxy emission calculation were not available yet, therefore emissions were calculated by either using previous three years average F-gases amounts filled into new manufactured products or keeping previous year`s emission amount. Total F-gases emissions (2.F + 2.G) have decreased by 1.0% compared to 2019.<br>Solvents Activity data for the Solvent Use sector was not available in 2020. There is a stability in trends of CO2 emissions from Solvent use sector in later 3 years either, therefore emissions in 2020 were assumed were extrapolated taking into account emission rates from these previous years (average). There are slight increase in emissions compared with the previous year (+5.4%).<br>For N2O from product use activity data wasn't available in 2020. There is a stability in trends of N2O emissions from N2O from product use sector in later 3 years therefore emissions were extrapolated taking into account emission rates from previous these years (average). There are negligible changes in emissions compared with the previous year (+2.89%).<br>Agriculture. In 2020 GHG emissions are 2240.22 kt CO2 eq., that was 1.7% more than a year before. Emissions from enteric fermentation increase by 0.1%, emissions from manure management decrease by 0.4% and emissions from agricultural soils increase by 1.8%, also emissions from liming increase by 39%. Compared to 2019, the total utilised agricultural area in the country grew by 9.6 thousand ha or 0.5 %, reaching 1 969.0 thousand ha in 2020. In 2020, compared to the year before, arable land increased by 14.9 thousand ha or 1.1 % Areas of meadows and pastures continued to reduce – in 2020, compared to 2019, by 5.6 thousand ha or 0.9 %. In 2020, the highest harvested production of grain in the history of Latvia was obtained - 3.5 million tonnes, which is 333.9 thousand tonnes or 10.6 % more than in the previous year. In 2020, 753.7 thousand hectares were sown with cereals, which is 11.4 thousand hectares or 1.5 % more than in the previous year, and it is the largest area of cereals in Latvian agriculture. Consumption of nutrients per hectare of sown area increased – of nitrogen from 64 kg in 2019 to 66 kg in 2020 or by 3.1 %. The increase in the volume of mineral fertilizers used per hectare was facilitated mainly by the growth of the volume of mineral fertilizers used per hectare of cereals and industrial crops respectively by 5.0 % and 5.6 %. Mineral fertilizers were applied on 64 % of the total sown area (60 % in 2019). At the end of 2020, the number of cattle increased by 3,7 thousand or 0.9 %, while the number of dairy cows decreased by 2,4 thousand or 1.7 %. During the year, the number of poultry has increased by 147.5 thousand or 2.6 %, in turn, the number of pigs has decreased – by 7.4 thousand or 2.3 %, the number of sheep – by 7.9 thousand or 7.9 %, the number of goats – by 0.2 thousand or 1.8 %, the number of horses – by 0.01 thousand or 0.1 %.<br>Waste. In 2020 emissions is decreased by 4.6% compared to 2019. Decrease in waste disposal subsector is due to decrease of disposed waste amount. Small increase in waste incineration and biological treatment subsectors due to increase of composting and waste incineration without energy recovery. Slight increase of CH4 emission in the Waste Water Handling sector (5D) is due small increase of part of population non connected to centralized waste water collection and treatment. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Malta
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt ) | | | | | | | | | CO2 equivalent (Gg ) | |
| **Total (net emissions)[1]** | 1 607,31 | 197,03 | 46,23 | 266,86 | 0,00 | 0,27 | NO | NO | 2 117,70 | 809,85 | 1 307,86 |
| **1. Energy** | 1 602,23 | 4,99 | 5,23 | | | | | | 1 612,45 | **809,85** | **802,61** |
| A. Fuel combustion (sectoral approach) | 1 602,23 | 4,99 | 5,23 | | | | | | 1 612,45 | 809,85 | **802,61** |
| 1. Energy industries | 809,85 | 0,41 | 0,58 | | | | | | 810,83 | 809,85 | **0,98** |
| 2. Manufacturing industries and construction | 34,72 | 0,03 | 0,06 | | | | | | 34,82 | | **34,82** |
| 3. Transport | 682,52 | 3,83 | 4,40 | | | | | | 690,75 | | **690,75** |
| 4. Other sectors | 75,14 | 0,73 | 0,19 | | | | | | 76,06 | | **76,06** |
| 5. Other | NO | NO | NO | | | | | | NO | | |
| B. Fugitive emissions from fuels | NO | NO | NO | | | | | | NO | | |
| 1. Solid fuels | NO | NO | NO | | | | | | NO | | |
| 2. Oil and natural gas | NO | NO | NO | | | | | | NO | | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 4,53 | NO | 1,39 | 266,86 | 0,00 | 0,27 | NO | NO | 273,05 | | **273,05** |
| A. Mineral industry | 0,19 | | | | | | | | 0,19 | | **0,19** |
| B. Chemical industry | 0,00 | NO | NO | NO | NA | NA | NA | NA | 0,00 | | **0,00** |
| C. Metal industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |
| D. Non-energy products from fuels and solvent use | 4,34 | NA | NA | | | | | | 4,34 | | **4,34** |
| E. Electronic Industry | | | | 0,06 | NA | NA | NA | NA | 0,06 | | **0,06** |
| F. Product uses as ODS substitutes | | | | 266,80 | NA | NA | NA | NA | 266,80 | | **266,80** |
| G. Other product manufacture and use | NA | NA | 1,39 | NA | 0,00 | 0,27 | NA | NA | 1,66 | | **1,66** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |
| **3. Agriculture** | 0,00 | 39,12 | 31,02 | | | | | | 70,14 | | |
| A. Enteric fermentation | | 34,14 | | | | | | | 34,14 | | |
| B. Manure management | | 4,98 | 12,35 | | | | | | 17,33 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 18,68 | | | | | | 18,68 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | NO | | | | | | | | NO | | |
| H. Urea application | NE | | | | | | | | NE | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -0,09 | NO | 0,43 | | | | | | 0,34 | | |
| A. Forest land | NO | NO | NO | | | | | | 0,00 | | |
| B. Cropland | -1,59 | NO | 0,31 | | | | | | -1,28 | | |
| C. Grassland | NO | NO | NO | | | | | | NO | | |
| D. Wetlands | NO | NO | NO | | | | | | NO | | |
| E. Settlements | 0,56 | NO | 0,05 | | | | | | 0,61 | | |
| F. Other land | 0,93 | NO | 0,08 | | | | | | 1,01 | | |
| G. Harvested wood products | NO | | | | | | | | NO | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 0,64 | 152,92 | 8,16 | | | | | | 161,72 | | |
| A. Solid waste disposal | NA | 145,47 | | | | | | | 145,47 | | |
| B. Biological treatment of solid waste | | 0,81 | NO | | | | | | 0,81 | | |
| C. Incineration and open burning of waste | 0,64 | 0,00 | 0,16 | | | | | | 0,81 | | |
| D. Waste water treatment and discharge | | 6,63 | 8,00 | | | | | | 14,63 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 7 142,98 | 15,96 | 55,49 | | | | | | 7 214,43 | | |
| Aviation | 153,60 | 0,03 | 1,24 | | | | | | 154,87 | | |
| Navigation | 6 989,38 | 15,93 | 54,25 | | | | | | 7 059,56 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 42,89 | | | | | | | | 42,89 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NO | | | | | | | | NO | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 2 117,36 | 809,85 | 1 307,51 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 2 117,70 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 2 117,36 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 2 117,70 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

For the purposes of reporting of the approximated greenhouse gas inventory, and in view of the level of dis-/aggregation of this submission, proces emissions related to the use of urea and that fall within the scope of the EU ETS Directive are not reported under column ETS. Such emissions amounted to 0.36 ktonnes CO2 eq in 2020.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2022
Country Netherlands
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 141 955,21 | 16 921,54 | 7 854,14 | 1 555,15 | 80,56 | 111,22 | NO | NO | 168 477,81 | | |
| **1. Energy** | 131 963,55 | 2 043,17 | 640,94 | | | | | | 134 647,65 | **68 921,51** | **65 726,15** |
| A. Fuel combustion (sectoral approach) | 131 029,61 | 1 590,50 | 640,94 | | | | | | 133 261,04 | 68 023,34 | **65 237,70** |
| 1. Energy industries | 47 742,84 | 138,96 | 322,20 | | | | | | 48 204,00 | 46 611,11 | **1 592,89** |
| 2. Manufacturing industries and construction | 26 918,07 | 64,57 | 42,81 | | | | | | 27 025,45 | 20 892,31 | **6 133,14** |
| 3. Transport | 26 043,54 | 59,98 | 222,63 | | | | | | 26 326,15 | | **26 326,15** |
| 4. Other sectors | 30 164,46 | 1 326,63 | 50,73 | | | | | | 31 541,82 | 519,92 | **31 021,90** |
| 5. Other | 160,71 | 0,35 | 2,56 | | | | | | 163,62 | | **163,62** |
| B. Fugitive emissions from fuels | 933,94 | 452,67 | NO | | | | | | 1 386,61 | 898,16 | **488,45** |
| 1. Solid fuels | 71,71 | 4,65 | NO | | | | | | 76,36 | 71,71 | **4,65** |
| 2. Oil and natural gas | 862,23 | 448,02 | NO | | | | | | 1 310,25 | 826,45 | **483,80** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 5 613,17 | 373,94 | 1 309,88 | 1 555,15 | 80,56 | 111,22 | NO | NO | 9 043,92 | **5 192,75** | **3 851,17** |
| A. Mineral industry | 1 096,10 | | | | | | | | 1 096,10 | 584,47 | **511,63** |
| B. Chemical industry | 4 155,74 | 328,10 | 1 223,67 | 118,80 | 9,67 | NO | NO | NO | 5 835,97 | 4 563,93 | **1 272,04** |
| C. Metal industry | 18,11 | NO | NO | NO | 27,31 | NO | NO | | 45,42 | 44,35 | **1,07** |
| D. Non-energy products from fuels and solvent use | 325,38 | 0,31 | NO | | | | | | 325,70 | | **325,70** |
| E. Electronic Industry | | | | NO | 43,59 | NO | NO | NO | 43,59 | | **43,59** |
| F. Product uses as ODS substitutes | | | | 1 436,35 | NO | NO | NO | NO | 1 436,35 | | **1 436,35** |
| G. Other product manufacture and use | 0,72 | 45,53 | 86,21 | NO | NO | 111,22 | | | 243,68 | | **243,68** |
| H. Other | 17,12 | NO | NO | | | | | | 17,12 | | **17,12** |
| **3. Agriculture** | 80,12 | 11 891,08 | 5 634,81 | | | | | | 17 606,02 | | |
| A. Enteric fermentation | | 8 133,23 | | | | | | | 8 133,23 | | |
| B. Manure management | | 3 757,85 | 794,35 | | | | | | 4 552,20 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NO | 4 840,47 | | | | | | 4 840,47 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 34,94 | | | | | | | | 34,94 | | |
| H. Urea application | 45,18 | | | | | | | | 45,18 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NA | NA | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | 4 298,38 | 0,33 | 101,62 | | | | | | 4 400,32 | | |
| A. Forest land | -1 854,28 | 0,27 | 4,82 | | | | | | -1 849,19 | | |
| B. Cropland | 1 554,09 | NO | 49,58 | | | | | | 1 603,67 | | |
| C. Grassland | 2 783,83 | 0,05 | 7,84 | | | | | | 2 791,73 | | |
| D. Wetlands | 23,41 | NO | 2,63 | | | | | | 26,03 | | |
| E. Settlements | 1 496,81 | NO | 26,74 | | | | | | 1 523,55 | | |
| F. Other land | 184,99 | NO | 10,01 | | | | | | 195,00 | | |
| G. Harvested wood products | 109,52 | | | | | | | | 109,52 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | NO | 2 613,02 | 166,88 | | | | | | 2 779,90 | | |
| A. Solid waste disposal | NO | 2 267,82 | | | | | | | 2 267,82 | | |
| B. Biological treatment of solid waste | | 114,53 | 91,04 | | | | | | 205,57 | | |
| C. Incineration and open burning of waste | NO | 0,12 | 0,08 | | | | | | 0,21 | | |
| D. Waste water treatment and discharge | | 230,55 | 75,76 | | | | | | 306,31 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 44 320,74 | 86,71 | 347,06 | | | | | | 44 754,51 | | |
| Aviation | 6 631,41 | 1,16 | 55,28 | | | | | | 6 687,85 | | |
| Navigation | 37 689,33 | 85,55 | 291,79 | | | | | | 38 066,66 | | |
| **Multilateral operations** | IE | IE | IE | | | | | | IE | | |
| **$CO_2$ emissions from biomass** | 18 334,16 | | | | | | | | 18 334,16 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NO | | | | | | | | NO | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | 431,13 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 164 077,49 | 74 114,25 | 89 963,24 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 168 477,81 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 164 508,62 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 168 908,94 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Poland
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 285 543,54 | 44 871,98 | 24 146,77 | 4 004,23 | 10,22 | 97,38 | NO | NO | 358 674,11 | NE | |
| **1. Energy** | 281 781,94 | 20 194,00 | 2 537,54 | | | | | | 304 513,48 | NE | |
| A. Fuel combustion (sectoral approach) | 277 281,64 | 3 068,54 | 2 536,94 | | | | | | 282 887,12 | NE | |
| 1. Energy industries | 138 933,76 | 102,17 | 640,33 | | | | | | 139 676,26 | NE | |
| 2. Manufacturing industries and construction | 29 952,42 | 117,78 | 191,71 | | | | | | 30 261,91 | NE | |
| 3. Transport | 62 865,58 | 125,33 | 636,83 | | | | | | 63 627,74 | NE | |
| 4. Other sectors | 45 529,87 | 2 723,27 | 1 068,07 | | | | | | 49 321,21 | NE | |
| 5. Other | NO | NO | NO | | | | | | NO | NE | |
| B. Fugitive emissions from fuels | 4 500,30 | 17 125,46 | 0,60 | | | | | | 21 626,36 | NE | |
| 1. Solid fuels | 2 626,36 | 14 457,53 | NA | | | | | | 17 083,89 | NE | |
| 2. Oil and natural gas | 1 873,94 | 2 667,93 | 0,60 | | | | | | 4 542,47 | NE | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NE | |
| **2. Industrial processes and product use** | 19 008,45 | 57,76 | 743,68 | 4 004,23 | 10,22 | 97,38 | NO | NO | 23 921,72 | NE | |
| A. Mineral industry | 11 625,11 | | | | | | | | 11 625,11 | NE | |
| B. Chemical industry | 4 821,00 | 47,64 | 609,35 | NO | NO | NO | NO | NO | 5 477,99 | NE | |
| C. Metal industry | 1 891,26 | 10,12 | NA | NA | NO | NO | NO | NO | 1 901,38 | NE | |
| D. Non-energy products from fuels and solvent use | 671,08 | NO | NO | | | | | | 671,08 | NE | |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NE | |
| F. Product uses as ODS substitutes | | | | 4 004,23 | 10,22 | NO | NO | NO | 4 014,45 | NE | |
| G. Other product manufacture and use | NA | NA | 134,34 | NO | NO | 97,38 | NO | NO | 231,72 | NE | |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NE | |
| **3. Agriculture** | 1 122,67 | 14 031,08 | 17 963,69 | | | | | | 33 117,44 | | |
| A. Enteric fermentation | | 12 794,98 | | | | | | | 12 794,98 | | |
| B. Manure management | | 1 211,56 | 2 842,73 | | | | | | 4 054,29 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NA | 15 109,80 | | | | | | 15 109,80 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 24,53 | 11,17 | | | | | | 35,70 | | |
| G. Liming | 541,35 | | | | | | | | 541,35 | | |
| H. Urea application | 411,41 | | | | | | | | 411,41 | | |
| I. Other carbon-containing fertilizers | 169,91 | | | | | | | | 169,91 | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -16 981,23 | 16,70 | 1 963,25 | | | | | | -15 001,27 | | |
| A. Forest land | -15 161,19 | 11,72 | 194,07 | | | | | | -14 955,41 | | |
| B. Cropland | -924,71 | NO | 21,35 | | | | | | -903,36 | | |
| C. Grassland | -63,44 | 4,98 | 3,29 | | | | | | -55,16 | | |
| D. Wetlands | 1 426,39 | NO | 0,86 | | | | | | 1 427,25 | | |
| E. Settlements | 2 421,50 | NO | 1 743,69 | | | | | | 4 165,19 | | |
| F. Other land | NO | NO | NO | | | | | | NO | | |
| G. Harvested wood products | -4 679,79 | | | | | | | | -4 679,79 | | |
| H. Other | NA | NA | NA | | | | | | NA | | |
| **5. Waste** | 611,71 | 10 572,44 | 938,61 | | | | | | 12 122,75 | | |
| A. Solid waste disposal | NO | 7 900,18 | | | | | | | 7 900,18 | | |
| B. Biological treatment of solid waste | | 121,16 | 86,65 | | | | | | 207,81 | | |
| C. Incineration and open burning of waste | 611,71 | 0,00 | 64,84 | | | | | | 676,55 | | |
| D. Waste water treatment and discharge | | 2 551,09 | 787,12 | | | | | | 3 338,21 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 2 123,30 | 1,94 | 17,39 | | | | | | 2 142,64 | | |
| Aviation | 1 392,22 | 0,24 | 11,61 | | | | | | 1 404,07 | | |
| Navigation | 731,08 | 1,70 | 5,79 | | | | | | 738,57 | | |
| **Multilateral operations** | NA | NA | NA | | | | | | NA | | |
| **$CO_2$ emissions from biomass** | 33 879,17 | | | | | | | | 33 879,17 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | 46 091,85 | | | | | | | | 46 091,85 | | |
| **Indirect $N_2O$** | | | NA | | | | | | | | |
| **Indirect $CO_2$[3]** | NA | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 373 675,39 | 171 729,33 | 201 878,31 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 358 674,11 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 44399
Country Portugal
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 34 962,15 | 9 354,51 | 3 543,55 | 3 373,12 | 21,32 | 23,86 | NO | NO | 51 278,51 | 18 926,58 | 32 351,93 |
| **1. Energy** | 38 081,95 | 363,89 | 533,47 | | | | | | 38 979,31 | **15 872,03** | **23 107,28** |
| A. Fuel combustion (sectoral approach) | 37 054,71 | 298,58 | 531,21 | | | | | | 37 884,50 | 14 897,74 | **22 986,76** |
| 1. Energy industries | 10 452,46 | 11,57 | 109,83 | | | | | | 10 573,86 | 9 640,79 | **933,07** |
| 2. Manufacturing industries and construction | 7 562,88 | 50,07 | 110,66 | | | | | | 7 723,62 | 5 064,15 | **2 659,47** |
| 3. Transport | 14 764,09 | 18,56 | 146,15 | | | | | | 14 928,79 | 192,80 | **14 735,99** |
| 4. Other sectors | 4 214,70 | 218,37 | 164,06 | | | | | | 4 597,13 | 0,00 | **4 597,13** |
| 5. Other | 60,58 | 0,01 | 0,50 | | | | | | 61,10 | 0,00 | **61,10** |
| B. Fugitive emissions from fuels | 1 027,24 | 65,31 | 2,26 | | | | | | 1 094,81 | 974,29 | **120,52** |
| 1. Solid fuels | 0,00 | 15,53 | 0,00 | | | | | | 15,53 | 13,82 | **1,71** |
| 2. Oil and natural gas | 1 027,24 | 49,77 | 2,26 | | | | | | 1 079,27 | 960,46 | **118,81** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 4 092,70 | 28,01 | 93,77 | 3 373,12 | 21,32 | 23,86 | 0,00 | 0,00 | 7 632,78 | **3 054,55** | **4 578,22** |
| A. Mineral industry | 3 081,44 | | | | | | | | 3 081,44 | 2 893,66 | **187,78** |
| B. Chemical industry | 680,55 | 27,09 | 46,06 | NO | NO | NO | NO | NO | 753,71 | 100,32 | **653,40** |
| C. Metal industry | 96,74 | NO | NO | NO | NO | NO | NO | NO | 96,74 | 60,58 | **36,16** |
| D. Non-energy products from fuels and solvent use | 233,96 | 0,91 | NO | | | | | | 234,87 | 0,00 | **234,87** |
| E. Electronic Industry | | | | NE | NE | NE | NE | NO | NO | 0,00 | |
| F. Product uses as ODS substitutes | | | | 3 373,12 | 21,32 | NO | NO | NO | 3 394,45 | 0,00 | **3 394,45** |
| G. Other product manufacture and use | NO | NO | 47,71 | NO | NO | 23,86 | NO | NO | 71,56 | 0,00 | **71,56** |
| H. Other | 0,00 | NO | NO | NO | NO | NO | NO | NO | 0,00 | 0,00 | **0,00** |
| **3. Agriculture** | 38,03 | 4 475,00 | 2 406,46 | | | | | | 6 919,49 | | |
| A. Enteric fermentation | | 3 572,85 | | | | | | | 3 572,85 | | |
| B. Manure management | | 737,77 | 213,27 | | | | | | 951,04 | | |
| C. Rice cultivation | | 131,72 | | | | | | | 131,72 | | |
| D. Agricultural soils | | NO | 2 173,96 | | | | | | 2 173,96 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 32,67 | 19,23 | | | | | | 51,90 | | |
| G. Liming | 7,25 | | | | | | | | 7,25 | | |
| H. Urea application | 21,91 | | | | | | | | 21,91 | | |
| I. Other carbon-containing fertilizers | 8,86 | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -7 281,08 | 158,20 | 315,46 | | | | | | -6 807,42 | | |
| A. Forest land | -9 331,79 | 82,01 | 34,56 | | | | | | -9 215,22 | | |
| B. Cropland | 559,56 | 3,60 | 44,93 | | | | | | 608,09 | | |
| C. Grassland | 72,21 | 1,25 | 24,27 | | | | | | 97,73 | | |
| D. Wetlands | 289,89 | 0,00 | 22,80 | | | | | | 312,69 | | |
| E. Settlements | 2 228,05 | 0,00 | 162,61 | | | | | | 2 390,66 | | |
| F. Other land | -994,17 | 71,34 | 26,29 | | | | | | -896,54 | | |
| G. Harvested wood products | -104,83 | | | | | | | | -104,83 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 30,55 | 4 329,41 | 194,40 | | | | | | 4 554,36 | | |
| A. Solid waste disposal | NO | 3 569,34 | | | | | | | 3 569,34 | | |
| B. Biological treatment of solid waste | | 25,36 | 13,90 | | | | | | 39,26 | | |
| C. Incineration and open burning of waste | 30,55 | 0,21 | 0,86 | | | | | | 31,62 | | |
| D. Waste water treatment and discharge | | 734,50 | 179,63 | | | | | | 914,14 | | |
| E. Other | NO | 0,00 | 0,00 | | | | | | 0,00 | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | NE | NE | NE | | | | | | NE | | |
| Navigation | NE | NE | NE | | | | | | NE | | |
| **Multilateral operations** | NE | NE | NE | | | | | | NE | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NE | | | | | | | | NE | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | 152,14 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 58 085,93 | 18 926,58 | 39 159,35 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 51 278,51 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 58 238,07 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 51 430,65 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| * In 2020 there was a decrease in GHG emissions in the Energy sector, with the main contribution of categories 1A1 "Energy industries" and 1A3 "Transport"<br>* Following a trend started in 2019, the main reason for the reduction of emissions in category 1A1 is related to the decrease (-53%) in the consumption of coal in thermoelectric power plants.<br>* in category 1A3, the explanation for the reduction in emissions is related to the reduction in the movement of the Portuguese population during periods of confinement due to the COVID-19 pandemic.<br><br>* There is an estimated slight decrease of about 0.3% in the IPPU emissions mostly due to the balance of opposite tendencies of the following main categories:<br>- slight increase in cement industry (2A1), iron and steel sector (2C1) and nitric acid production (2B2);<br>- slight decrease in lime sector (2A2) and glass industry (2A3).<br><br>* There is an estimated slight increase of about 0.7% in the Agriculture GHG emissions mostly due to to balance of opposite tendencies of main categories:<br>- 3A (Enteric Fermentation): related to an increase in the livestock - particularly non-dairy cattle and sheep;<br>- 3B (Manure Management): related to an increase in the livestock - particularly poultry and swine;<br>- 3C (Rice Cultivation): decrease of rice cultivation areas;<br>- 3D (Agriculture Soils) and 3H (Urea Application): reduction in the application of synthetic fertilisers, including urea application. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Romania
Geographical scope[4] Romania

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 42 661.80 | 22 667.80 | 14 087.69 | 2 256.00 | 3.54 | 83.21 | NO | NO | 81 760.04 | 32 357.42 | 51 361.37 |
| **1. Energy** | 61 226.58 | 8 895.37 | 638.59 | | | | | | 70 760.54 | **22 657.93** | **48 102.61** |
| A. Fuel combustion (sectoral approach) | 60 432.04 | 1 101.22 | 637.81 | | | | | | 62 171.07 | 22 013.17 | **40 157.91** |
| 1. Energy industries | 20 305.01 | 370.01 | 214.30 | | | | | | 20 889.32 | 16 455.62 | **4 433.70** |
| 2. Manufacturing industries and construction | 11 787.92 | 214.81 | 124.41 | | | | | | 12 127.14 | 5 557.54 | **6 569.60** |
| 3. Transport | 17 757.78 | 323.59 | 187.42 | | | | | | 18 268.79 | NA | **18 268.79** |
| 4. Other sectors | 9 983.29 | 181.92 | 105.36 | | | | | | 10 270.57 | NA | **10 270.57** |
| 5. Other | 598.04 | 10.90 | 6.31 | | | | | | 615.25 | NA | **615.25** |
| B. Fugitive emissions from fuels | 794.53 | 7 794.15 | 0.79 | | | | | | 8 589.47 | 644.77 | **7 944.70** |
| 1. Solid fuels | NO | 5 418.89 | NO | | | | | | 5 418.89 | NA | **5 418.89** |
| 2. Oil and natural gas | 794.53 | 2 375.26 | 0.79 | | | | | | 3 170.58 | 644.77 | **2 525.81** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 10 512.54 | 8.69 | 94.27 | 2 256.00 | 3.54 | 83.21 | NO | NO | 12 958.25 | **9 699.49** | **3 258.76** |
| A. Mineral industry | 4 751.14 | | | | | | | | 4 751.14 | 4 659.09 | **92.05** |
| B. Chemical industry | 1 391.41 | 4.39 | 92.19 | NO | NO | NO | NO | NO | 1 487.99 | 1 209.34 | **278.64** |
| C. Metal industry | 3 834.66 | 4.30 | NO | NO | 3.52 | NO | NO | NO | 3 842.48 | 3 829.28 | **13.20** |
| D. Non-energy products from fuels and solvent use | 535.33 | NO | NO | | | | | | 535.33 | 1.77 | **533.56** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NA | |
| F. Product uses as ODS substitutes | | | | 2 256.00 | 0.01 | NO | NO | NO | 2 256.01 | NA | **2 256.01** |
| G. Other product manufacture and use | NO | NO | 2.08 | NO | NO | 83.21 | NO | NO | 85.30 | NA | **85.30** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NA | |
| **3. Agriculture** | 128.58 | 8 288.09 | 10 413.82 | | | | | | 18 830.49 | | |
| A. Enteric fermentation | | 7 328.36 | | | | | | | 7 328.36 | | |
| B. Manure management | | 635.68 | 1 076.48 | | | | | | 1 712.16 | | |
| C. Rice cultivation | | 29.03 | | | | | | | 29.03 | | |
| D. Agricultural soils | | NE | 9 229.88 | | | | | | 9 229.88 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 295.02 | 107.45 | | | | | | 402.47 | | |
| G. Liming | 48.19 | | | | | | | | 48.19 | | |
| H. Urea application | 80.40 | | | | | | | | 80.40 | | |
| I. Other carbon-containing fertilizers | NA | | | | | | | | NA | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -29 216.63 | 6.15 | 2 486.74 | | | | | | -26 723.73 | | |
| A. Forest land | -26 987.71 | 6.15 | 2.73 | | | | | | -26 978.83 | | |
| B. Cropland | -4 506.57 | NO | 966.45 | | | | | | -3 540.12 | | |
| C. Grassland | 888.52 | NO | 24.90 | | | | | | 913.42 | | |
| D. Wetlands | 665.84 | NO | 31.39 | | | | | | 697.23 | | |
| E. Settlements | 4 017.18 | NO | 385.34 | | | | | | 4 402.52 | | |
| F. Other land | 467.30 | NO | 1 075.94 | | | | | | 1 543.24 | | |
| G. Harvested wood products | -3 761.19 | | | | | | | | -3 761.19 | | |
| H. Other | NA | NA | NA | | | | | | NA | | |
| **5. Waste** | 10.72 | 5 469.50 | 454.27 | | | | | | 5 934.49 | | |
| A. Solid waste disposal | NA | 3 787.95 | | | | | | | 3 787.95 | | |
| B. Biological treatment of solid waste | | 32.98 | 23.60 | | | | | | 56.58 | | |
| C. Incineration and open burning of waste | 10.72 | 0.03 | 1.47 | | | | | | 12.22 | | |
| D. Waste water treatment and discharge | | 1 648.55 | 429.19 | | | | | | 2 077.74 | | |
| E. Other | NA | NA | NA | | | | | | NA | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 502.84 | 0.25 | 4.18 | | | | | | 507.27 | | |
| Aviation | 430.20 | 0.08 | 3.59 | | | | | | 433.86 | | |
| Navigation | 72.64 | 0.18 | 0.60 | | | | | | 73.41 | | |
| **Multilateral operations** | NA | NA | NA | | | | | | NA | | |
| **$CO_2$ emissions from biomass** | 18 063.17 | | | | | | | | 18 063.17 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | 357.71 | | | | | | | | 357.71 | | |
| **Indirect $N_2O$** | | | 2 742.69 | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 108 483.77 | 32 357.42 | 51 361.37 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 81 760.04 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
|---|
| Based on the requirement in the Art. 26.2 of the Regulation (EU) no. 2018/1999 corroborated with Art. 7.2 in the Regulation (EU) no. 2020/1208, please find below the elements on the explanations including on main drivers for the key changes in emissions and removals reported in accordance with the format set out in Annex VI of the Regulation (EU) no. 2020/1208 compared to the most recent final greenhouse gas inventory reported.<br><br>1 Energy (CRF sector 1)<br><br>The emissions trend reflects the changes in this period characterized by a process of transition to a market economy. With the entire economy in transition, some energy intensive industries reduced their activities, and this are reflected in the GHG emissions reduction.<br><br>In 2020 year, emissions from the Energy Sector have decreased by 4.21% (70,760.54 kt CO2 equivalent) compared to 2019 year (73,869.32 kt CO2 equivalent). The consumption for 2020 year for liquids fuels decreased by 0.99% compared to 2019 year, for solids fuels decreased with 0.72% and for gaseous fuels increased with 1.05%. The CO2 emissions for 2020 year from:<br>- liquids fuels (refinery gas, petroleum coke, kerosene type jet fuel) decreased by 1.28% (27,923.33 kt CO2 equivalent) compared with 2019 year (28,285.66 kt CO2 equivalent);<br>- solids fuels (coke oven coke, lignite) decreased with 27.58% (9,899.24 kt CO2 equivalent) compared with 2019 year (13,669.77 kt CO2 equivalent);<br>- natural gas increased by 5.37% (21,493.31 kt CO2 equivalent) compared with 2019 year (20,398.18 kt CO2 equivalent).<br><br>In 2020 year, the GHG emissions from the Fugitive emissions from fuels Subsector decreased with 0.48% compared with 2019 year:<br>- the emissions from coal mining and handling decreased with 1.72% compared with 2019; production of other bituminous coal and lignite and brown coal production from underground mines decreased due to the continuation of the mine closure process;<br>- in 2020 year, the emissions from oil and natural gas category, increased with 1.71% compared with 2019; although production of oil and natural gas decreased, the tendency to increase CO2 emissions is due to the inclusion of emissions according to ETS data.<br><br>2 Industrial Processes and Product Use (CRF sector 2)<br><br>2020 year approximated emissions from this sector decreased by 1.19% compared with emissions associated with 2019 year.<br><br>In 2020 year the emissions decreased compared with 2019 year due to decrease of various activities level (lime production, limestone and dolomite consumption, soda ash production, iron and steel production, aluminium production).<br><br>3 Agriculture (CRF sector 3)<br><br>2020 estimated emissions from this sector remain the same compared with 2019 associated estimates.<br><br>4 Land Use, Land-Use Change and Forestry (CRF sector 4)<br><br>The difference between the 2019 and, respectively, 2020 net emissions/removals level is 11.56%. The difference is caused by the following main drivers:<br>- the increased biomass growth according to the age class distribution into the forestland category assuming a constant harvest value for the year 2019. The harvest values for the year 2020 are not been published by the National Statistics service;<br>- recalculations of AD (kha) for CL, GL, WL, SL and OL, due to the use of the new geospatially explicit approach 3;<br>- estimation and use of country-specific parameters, CS, for the soil carbon pool.<br><br>5 Waste (CRF sector 5)<br><br>In 2020 year, the GHG emissions from the Waste Sector decreased with 0.32% compared with 2019 year; the reasons for the variation are as follows:<br>- the population consumption growth and increasing of waste managed sites number;<br>- the share of methane recovery decreased because certain waste disposal sites stopped the recovery of methane;<br>- fluctuations of the industrial production and of the population number connected to sewerage.<br><br>Information on the uncertainties associated to the LULUCF estimates<br><br>The uncertainties level associated with the approximated GHG emissions/removals estimates remains unchanged for the Forest land associated categories and gasses, when compared to the National GHG Inventory 2021.<br><br>The uncertainties associated with E (+) / R (-) levels for non-forest land are similar to the previous report: 30% -CL and GL, 100% - WL, SL and OL. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Sweden
Geographical scope[4] Sweden

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 37 646,01 | 4 109,80 | 4 591,04 | 989,54 | 65,33 | 33,21 | 0,00 | 0,00 | 47 434,93 | | |
| **1. Energy** | 32 101,41 | 206,10 | 596,40 | | | | | | 32 903,91 | **IE** | |
| A. Fuel combustion (sectoral approach) | 31 653,81 | 149,93 | 595,46 | | | | | | 32 399,20 | IE | |
| 1. Energy industries | 7 271,24 | 41,25 | 184,03 | | | | | | 7 496,52 | IE | |
| 2. Manufacturing industries and construction | 6 210,34 | 10,62 | 136,92 | | | | | | 6 357,88 | IE | |
| 3. Transport | 15 575,09 | 35,82 | 182,11 | | | | | | 15 793,01 | IE | |
| 4. Other sectors | 2 416,39 | 62,19 | 89,71 | | | | | | 2 568,29 | IE | |
| 5. Other | 180,76 | 0,05 | 2,69 | | | | | | 183,50 | IE | |
| B. Fugitive emissions from fuels | 447,60 | 56,17 | 0,94 | | | | | | 504,72 | IE | |
| 1. Solid fuels | IE | IE | IE | | | | | | IE | IE | |
| 2. Oil and natural gas | IE | IE | IE | | | | | | IE | IE | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | IE | |
| **2. Industrial processes and product use** | 5 297,68 | 9,49 | 183,17 | 989,54 | 65,33 | 33,21 | IE | NO | 6 577,82 | **IE** | |
| A. Mineral industry | IE | | | | | | | | IE | IE | |
| B. Chemical industry | IE | IE | IE | IE | IE | IE | IE | NO | IE | IE | |
| C. Metal industry | IE | IE | NA | 1,04 | 65,22 | NO | NA | NO | IE | IE | |
| D. Non-energy products from fuels and solvent use | IE | NA | NA | | | | | | IE | IE | |
| E. Electronic Industry | | | | NA | NA | NA | NA | NO | NA | IE | |
| F. Product uses as ODS substitutes | | | | 988,50 | 0,10 | NA | NA | NO | 988,60 | IE | |
| G. Other product manufacture and use | NE | NA | IE | IE | NO | 33,21 | IE | NO | IE | IE | |
| H. Other | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | |
| **3. Agriculture** | 127,11 | 3 199,02 | 3 582,77 | | | | | | 6 908,90 | | |
| A. Enteric fermentation | | 2 935,26 | | | | | | | 2 935,26 | | |
| B. Manure management | | 263,76 | 329,48 | | | | | | 593,24 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NO | 3 253,29 | | | | | | 3 253,29 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | IE | | | | | | | | IE | | |
| H. Urea application | IE | | | | | | | | IE | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | | | | | | | | | | | |
| **4. Land use, land-use change and forestry[1]** | -37 249,82 | 453,52 | 1 313,82 | | | | | | -35 482,47 | | |
| A. Forest land | -39 090,27 | 241,53 | 1 151,85 | | | | | | -37 696,88 | | |
| B. Cropland | 4 089,45 | 197,66 | 4,01 | | | | | | 4 291,11 | | |
| C. Grassland | 952,68 | 8,15 | 31,80 | | | | | | 992,64 | | |
| D. Wetlands | 184,95 | 6,18 | 1,08 | | | | | | 192,21 | | |
| E. Settlements | 2 974,99 | IE | 122,13 | | | | | | 3 097,12 | | |
| F. Other land | 0,22 | NO | NO | | | | | | 0,22 | | |
| G. Harvested wood products | -6 361,85 | | | | | | | | -6 361,85 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 119,82 | 695,19 | 228,70 | | | | | | 1 043,70 | | |
| A. Solid waste disposal | NO | IE | | | | | | | IE | | |
| B. Biological treatment of solid waste | | IE | IE | | | | | | IE | | |
| C. Incineration and open burning of waste | IE | IE | IE | | | | | | IE | | |
| D. Waste water treatment and discharge | | IE | IE | | | | | | IE | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | IE | IE | IE | IE | IE | IE | IE | NO | NO | IE | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 8 470,34 | 17,92 | 133,78 | | | | | | 8 622,05 | | |
| Aviation | 928,78 | 0,15 | 12,56 | | | | | | 941,49 | | |
| Navigation | 7 541,56 | 17,78 | 121,22 | | | | | | 7 680,56 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | NE | | |
| **Indirect $N_2O$** | | | 2,95 | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 47 434,34 | 16 716,16 | 30 717,84 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Slovenia
Geographical scope[4] Slovenia

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 12 998,31 | 1 909,20 | 771,47 | 297,16 | 9,62 | 15,85 | NO | NO | 16 001,61 | 6 095,59 | 9 906,02 |
| **1. Energy** | 12 159,44 | 382,46 | 138,93 | | | | | | 12 680,83 | **5 413,67** | **7 267,16** |
| A. Fuel combustion (sectoral approach) | 12 034,35 | 126,90 | 138,93 | | | | | | 12 300,18 | 5 350,21 | **6 949,98** |
| 1. Energy industries | 4 475,61 | 3,19 | 21,56 | | | | | | 4 500,36 | 4 326,80 | **173,56** |
| 2. Manufacturing industries and construction | 1 649,93 | 5,20 | 17,78 | | | | | | 1 672,91 | 1 023,41 | **649,51** |
| 3. Transport | 4 670,27 | 5,74 | 54,34 | | | | | | 4 730,35 | NO | **4 730,35** |
| 4. Other sectors | 1 234,55 | 112,78 | 45,22 | | | | | | 1 392,55 | NO | **1 392,55** |
| 5. Other | 3,98 | 0,00 | 0,03 | | | | | | 4,01 | NO | **4,01** |
| B. Fugitive emissions from fuels | 125,10 | 255,56 | 0,00 | | | | | | 380,65 | 63,47 | **317,19** |
| 1. Solid fuels | 124,98 | 216,44 | NO | | | | | | 341,41 | 63,47 | **277,95** |
| 2. Oil and natural gas | 0,12 | 39,12 | 0,00 | | | | | | 39,24 | NO | **39,24** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | **0,00** |
| **2. Industrial processes and product use** | 790,91 | 0,00 | 66,10 | 297,16 | 9,62 | 15,85 | NO | NO | 1 179,64 | **681,92** | **497,72** |
| A. Mineral industry | 560,73 | | | | | | | | 560,73 | 546,23 | **14,50** |
| B. Chemical industry | 60,30 | NO | NO | NO | NO | NO | NO | NO | 60,30 | NO | **60,30** |
| C. Metal industry | 135,16 | NO | NO | NO | 9,62 | NO | NO | NO | 144,79 | 135,69 | **9,09** |
| D. Non-energy products from fuels and solvent use | 34,71 | NA | NA | | | | | | 34,71 | NO | **34,71** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | **0,00** |
| F. Product uses as ODS substitutes | | | | 297,16 | NO | NO | NO | NO | 297,16 | NO | **297,16** |
| G. Other product manufacture and use | NO | NO | 66,10 | NO | NO | 15,85 | NO | NO | 81,95 | NO | **81,95** |
| H. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | NO | **0,00** |
| **3. Agriculture** | 28,18 | 1 175,26 | 520,43 | | | | | | 1 723,87 | | |
| A. Enteric fermentation | | 943,69 | | | | | | | 943,69 | | |
| B. Manure management | | 231,57 | 80,40 | | | | | | 311,97 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NO | 440,03 | | | | | | 440,03 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 12,98 | | | | | | | | 12,98 | | |
| H. Urea application | 10,39 | | | | | | | | 10,39 | | |
| I. Other carbon-containing fertilizers | 4,81 | | | | | | | | 4,81 | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | NE | NE | NE | | | | | | NE | | |
| B. Cropland | NE | NE | NE | | | | | | NE | | |
| C. Grassland | NE | NE | NE | | | | | | NE | | |
| D. Wetlands | NE | NE | NE | | | | | | NE | | |
| E. Settlements | NE | NE | NE | | | | | | NE | | |
| F. Other land | NE | NE | NE | | | | | | NE | | |
| G. Harvested wood products | NE | | | | | | | | NE | | |
| H. Other | NE | NE | NE | | | | | | NE | | |
| **5. Waste** | 19,78 | 351,47 | 46,01 | | | | | | 417,26 | | |
| A. Solid waste disposal | NE | 207,52 | | | | | | | 207,52 | | |
| B. Biological treatment of solid waste | | 11,24 | 8,04 | | | | | | 19,27 | | |
| C. Incineration and open burning of waste | 19,78 | 0,00 | 0,07 | | | | | | 19,85 | | |
| D. Waste water treatment and discharge | | 132,71 | 37,90 | | | | | | 170,61 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | NE | NE | NE | | | | | | NE | | |
| Navigation | NE | NE | NE | | | | | | NE | | |
| **Multilateral operations** | NE | NE | NE | | | | | | NE | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | NE | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | NO | | | | | | | | NO | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 16 001,61 | 6 095,59 | 9 906,02 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
(2) See footnote 7 to table Summary 1.A.
(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS | | | | | | | | Year | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Sheet 1 of 1) | | | | | | | | Submission | 1 | | |
| | | | | | | | | Country | Slovakia | | |
| | | | | | | | | Geographical scope[4] | country | | |
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
| | $CO_2$ equivalent (kt ) | | | | | | | | | CO2 equivalent (Gg ) | |
| **Total (net emissions)[1]** | 22 948,95 | 3 280,78 | 2 026,43 | 706,32 | 5,61 | 8,80 | NO | NO | 28 976,89 | 18 170,00 | 10 806,88 |
| **1. Energy** | 24 319,91 | 685,86 | 195,46 | | | | | | 25 201,23 | **10 823,10** | **14 378,14** |
| A. Fuel combustion (sectoral approach) | 24 300,08 | 222,17 | 195,46 | | | | | | 24 717,71 | 10 823,10 | **13 894,62** |
| 1. Energy industries | 6 406,44 | 12,93 | 29,23 | | | | | | 6 448,60 | 5 736,79 | **711,81** |
| 2. Manufacturing industries and construction | 5 868,42 | 15,92 | 31,39 | | | | | | 5 915,73 | 4 910,89 | **1 004,84** |
| 3. Transport | 7 220,16 | 7,17 | 72,54 | | | | | | 7 299,87 | 168,43 | **7 131,45** |
| 4. Other sectors | 4 728,21 | 186,03 | 61,92 | | | | | | 4 976,16 | 6,99 | **4 969,17** |
| 5. Other | 76,85 | 0,12 | 0,38 | | | | | | 77,35 | NO | **77,35** |
| B. Fugitive emissions from fuels | 19,83 | 463,69 | 0,00 | | | | | | 483,52 | NO | **483,52** |
| 1. Solid fuels | 18,65 | 248,64 | NO | | | | | | 267,29 | NO | **267,29** |
| 2. Oil and natural gas | 1,18 | 215,05 | 0,00 | | | | | | 216,23 | NO | **216,23** |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | NO | |
| **2. Industrial processes and product use** | 7 322,74 | 1,06 | 141,91 | 706,32 | 5,61 | 8,80 | NO | NO | 8 186,44 | **7 346,90** | **839,54** |
| A. Mineral industry | 2 233,59 | | | | | | | | 2 233,59 | 2 211,97 | **21,62** |
| B. Chemical industry | 1 620,19 | 0,14 | 76,11 | NO | NO | NO | NO | NO | 1 696,44 | 1 696,13 | **0,31** |
| C. Metal industry | 3 433,21 | 0,92 | NO | NO | 5,61 | NO | NO | NO | 3 439,74 | 3 438,80 | **0,94** |
| D. Non-energy products from fuels and solvent use | 35,75 | NO | NO | | | | | | 35,75 | NO | **35,75** |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | NO | |
| F. Product uses as ODS substitutes | | | | 706,32 | NO | NO | NO | NO | 706,32 | NO | **706,32** |
| G. Other product manufacture and use | NO | NO | 65,80 | NO | NO | 8,80 | NO | NO | 74,60 | NO | **74,60** |
| H. Other | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| **3. Agriculture** | 75,56 | 1 007,34 | 1 491,05 | | | | | | 2 573,95 | | |
| A. Enteric fermentation | | 918,82 | | | | | | | 918,82 | | |
| B. Manure management | | 88,52 | 145,89 | | | | | | 234,41 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NO | 1 345,16 | | | | | | 1 345,16 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 12,02 | | | | | | | | 12,02 | | |
| H. Urea application | 63,54 | | | | | | | | 63,54 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -8 769,59 | 22,14 | 35,66 | | | | | | -8 711,79 | | |
| A. Forest land | -7 097,07 | 22,14 | 14,60 | | | | | | -7 060,33 | | |
| B. Cropland | -1 098,28 | NO | 11,15 | | | | | | -1 087,13 | | |
| C. Grassland | -93,16 | NO | 0,31 | | | | | | -92,85 | | |
| D. Wetlands | NO | NO | NO | | | | | | NO | | |
| E. Settlements | 78,44 | NO | 4,58 | | | | | | 83,02 | | |
| F. Other land | 92,30 | NO | 5,02 | | | | | | 97,32 | | |
| G. Harvested wood products | -651,82 | | | | | | | | -651,82 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 0,33 | 1 564,38 | 162,35 | | | | | | 1 727,06 | | |
| A. Solid waste disposal | NO | 1 122,18 | | | | | | | 1 122,18 | | |
| B. Biological treatment of solid waste | | 163,16 | 116,69 | | | | | | 279,85 | | |
| C. Incineration and open burning of waste | 0,33 | 0,04 | 0,08 | | | | | | 0,45 | | |
| D. Waste water treatment and discharge | | 279,00 | 45,58 | | | | | | 324,58 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |
| | | | | | | | | | | | |
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 33,33 | 0,04 | 0,27 | | | | | | 33,64 | | |
| Aviation | 17,62 | 0,00 | 0,14 | | | | | | 17,76 | | |
| Navigation | 15,71 | 0,04 | 0,13 | | | | | | 15,88 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 7 797,64 | | | | | | | | 7 797,64 | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | 3 007,25 | | | | | | | | 3 007,25 | | |
| **Indirect $N_2O$** | | | NO | | | | | | | | |
| **Indirect $CO_2$[3]** | NO | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 37 688,68 | 18 170,00 | 19 518,68 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 28 976,88 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and

(2) See footnote 7 to table Summary 1.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| ENERGY: Based on preliminary data (and EU-ETS reports) a decrease of CO2 emission is expected in the categories 1.A.1 and 1.A.2. The decrease is mainly caused by significant reduction of steel production. Similar trend is visible in corresponding IPPU categories. The decrease of CO2 emissions in iron and steel production is on a level of 870 Gg of CO2. Significant decrease is also expected in category 1.A.1.a, where the decrease of emissions is more than 520 Gg of CO2. No EU ETS data is available for categories 1.A.4. and 1.A.5, therefore the emissions are estimated mainly based on trends from previous years, thus CO2 emissions remain practically at the same level.<br>TRANSPORT: Total emissions decreased as a result of lower road transportation and mobility during the COVID 19 pandemic year. There was a major decrease of fuel consumption on the level of 10%.<br>MEMO ITEMS: Emissions are not significant and proxy is calculated based on the real consumption for the year 2020 affected by the COVID 19 pandemic.<br>IPPU: Categories 2.A, 2.B and 2.C were estimated based on the EU ETS verified GHG emissions 2020. ESD emissions in categories 2.A, 2.B, 2.C, 2.D and 2.G were extrapolated based on the 5-years average.<br>AGRICULTURE: The official statistics for 2020 for livestock number and animal production data were used in the 2020 proxy estimate. Activity data for 2020 consumption of inorganic nitrogen fertilizers, sewage sludge, compost, limestone, dolomite, and urea were not available. Instead of these, extrapolated data using the 30-years mean was used. Emissions decreased in 3.B Manure Management and in 3.A Enteric Fermentation due to the decline of livestock number in all animal subcategories. The emissions from the 3.D Agricultural Soil decreased compare to the previous submission. The main driver of emissions drop is the significant reduction of breeding animals, despite of expectation of slight increase in inorganic nitrogen fertilizers. N2O emissions in 3.D.1.1 increased insignificantly.<br><br>LULUCF: A. FOREST LAND: Emissions of CO2, CH4 and N2O are preliminary and were calculated using new input data from 2020. Significant increase in sinks was caused by the lower harvest of wood (lower gains) in this category. 4.B CROPLAND: Emissions of CO2, CH4 and N2O are preliminary and were calculated using new input data from 2020. C. GRASSLAND: Emissions of CO2, CH4 and N2O are preliminary and were calculated using new input data from 2020. D. WETLANDS: Slovakia does not report this category. E. SETTLEMENTS: Emissions of CO2 and N2O are preliminary and were calculated using new input data from 2020. F. OTHER LAND: Emissions of CO2 and N2O are preliminary and were calculated using new input data from 2020. G. HWP: FAO database for 2020 was not available. Emissions were estimated using the input FAO data from 2019 and the harvested wood volume from 2020.<br>WASTE: The proxy estimates of emissions were prepared from analysis of 5-year data. There are no new data available, which have impact on emission estimates from waste sector as published in the last submission. Emissions from waste disposal at the same level as in 2019 and will be updated later. Emissions from 5.D wastewater are decreasing at a rate of 1,4% per year due to increasing share of connectivity to the public sewage treatment plant. The impact of the COVID pandemic on the reduction of industrial production and wastewater was also taken into account. The statistical data on waste recovery was not available in 5.B, therefore extrapolation was proceed using the 30-years mean. The emissions increased compare to the previous submission. Incineration of waste is on the same level according to the data available in national database of stationary sources. |

**SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS**
**(Sheet 1 of 1)**

Year 2020
Submission 2021
Country Iceland
Geographical scope[4]

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalent (kt ) | | | | | | | | | CO2 equivalent (Gg ) | |
| **Total (net emissions)[1]** | 9 020,68 | 3 975,36 | 288,53 | 174,92 | 95,67 | 3,15 | NO | NO | 13 558,31 | | |
| **1. Energy** | 1 638,66 | 6,20 | 18,22 | | | | | | 1 663,08 | | |
| A. Fuel combustion (sectoral approach) | 1 463,78 | 2,41 | 18,22 | | | | | | 1 484,42 | | |
| 1. Energy industries | 1,78 | 0,00 | 0,00 | | | | | | 1,78 | | |
| 2. Manufacturing industries and construction | 66,08 | 0,08 | 3,90 | | | | | | 70,06 | 0,61 | **69,46** |
| 3. Transport | 860,15 | 1,09 | 7,48 | | | | | | 868,72 | | |
| 4. Other sectors | 535,42 | 1,24 | 6,83 | | | | | | 543,49 | | |
| 5. Other | 0,36 | 0,00 | 0,00 | | | | | | 0,36 | | |
| B. Fugitive emissions from fuels | 174,87 | 3,79 | 0,00 | | | | | | 178,66 | | |
| 1. Solid fuels | NO | NO | NO | | | | | | 0,00 | | |
| 2. Oil and natural gas | 174,87 | 3,79 | 0,00 | | | | | | 178,66 | | |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO | | |
| **2. Industrial processes and product use** | 1 683,67 | 3,07 | 2,47 | 174,92 | 95,67 | 3,15 | NO | NO | 1 962,95 | **415,74** | **1 547,21** |
| A. Mineral industry | 0,89 | | | | | | | | 0,89 | | |
| B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |
| C. Metal industry | 1 677,04 | 3,04 | NO | NO | 95,58 | NO | NO | NO | 1 775,66 | | |
| D. Non-energy products from fuels and solvent use | 5,71 | NO | NO | | | | | | 5,71 | | |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO | | |
| F. Product uses as ODS substitutes | | | | 174,92 | 0,09 | NO | NO | NO | 175,01 | | |
| G. Other product manufacture and use | 0,02 | 0,03 | 2,47 | NO | NO | 3,15 | NO | NO | 5,67 | | |
| H. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | | |
| **3. Agriculture** | 5,79 | 345,86 | 258,02 | | | | | | 609,68 | | |
| A. Enteric fermentation | | 291,25 | | | | | | | 291,25 | | |
| B. Manure management | | 54,60 | 17,84 | | | | | | 72,44 | | |
| C. Rice cultivation | | NO | | | | | | | 0,00 | | |
| D. Agricultural soils | | NA | 240,19 | | | | | | 240,19 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO | | |
| G. Liming | 1,91 | | | | | | | | 1,91 | | |
| H. Urea application | 1,93 | | | | | | | | 1,93 | | |
| I. Other carbon-containing fertilizers | 1,95 | | | | | | | | 1,95 | | |
| J. Other | NO | NO | NO | | | | | | 0,00 | | |
| **4. Land use, land-use change and forestry[1]** | 5 684,13 | 3 386,89 | 1,03 | | | | | | 9 072,06 | | |
| A. Forest land | -447,78 | 0,74 | 0,83 | | | | | | -446,21 | | |
| B. Cropland | 1 810,00 | 91,38 | NO | | | | | | 1 901,37 | | |
| C. Grassland | 5 385,49 | 423,03 | 0,20 | | | | | | 5 808,71 | | |
| D. Wetlands | -1 069,41 | 2 871,75 | NO | | | | | | 1 802,33 | | |
| E. Settlements | 5,87 | NE | 0,01 | | | | | | 5,88 | | |
| F. Other land | NA | NA | NA | | | | | | NA | | |
| G. Harvested wood products | -0,03 | | | | | | | | -0,03 | | |
| H. Other | IE | IE | IE | | | | | | IE | | |
| **5. Waste** | 8,42 | 233,34 | 8,79 | | | | | | 250,55 | | |
| A. Solid waste disposal | NO | 187,43 | | | | | | | 187,43 | | |
| B. Biological treatment of solid waste | | 3,41 | 2,44 | | | | | | 5,85 | | |
| C. Incineration and open burning of waste | 8,42 | 0,10 | 0,29 | | | | | | 8,81 | | |
| D. Waste water treatment and discharge | | 42,40 | 6,05 | | | | | | 48,46 | | |
| E. Other | NA | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | 342,66 | 0,01 | 2,83 | | | | | | 345,51 | | |
| Aviation | 256,25 | 0,00 | 2,14 | | | | | | 258,38 | | |
| Navigation | 86,42 | 0,01 | 0,70 | | | | | | 87,12 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | NO | | | | | | | | NO | | |
| **$CO_2$ captured** | NO | | | | | | | | NO | | |
| **Long-term storage of C in waste disposal sites** | | | | | | | | | | | |
| **Indirect $N_2O$** | | | NE | | | | | | | | |
| **Indirect $CO_2$[3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 4 486,25 | 416,34 | 1 616,67 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 13 558,31 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA | | |

[1] For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and
[2] See footnote 7 to table Summary 1.A.
[3] In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.
[4] Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

**Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website.**

The main trends for the 2020 Proxy inventory: In the energy sector the biggest change is the decrease in the Transport sector in light of the lockdowns due to the Covid-19 pandemic. In the IPPU sector there is a decrease in the 2C2 Metal sector, as one company closed its production temporary due to the Covid-19 pandemic. The emissions from HFCs (2F) decreased as well which is due to a lower import in 2013 (and a peak in emissions in 2019 due to high imports in 2012). In the Waste sector the increase in mainly due to emissions from SWDS (5A) as a decrease in flared/recovered methane was reported.

| SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS | | | | | | | | Year | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Sheet 1 of 1) | | | | | | | | Submission | 2021 | | |
| | | | | | | | | Country | Norway | | |
| | | | | | | | | Geographical scope[4] | NA | | |
| **GREENHOUSE GAS SOURCE AND SINK CATEGORIES** | **$CO_2$[1]** | **$CH_4$** | **$N_2O$** | **HFCs** | **PFCs** | **$SF_6$** | **Unspecified mix of HFCs and PFCs** | **$NF_3$** | **Total** | **ETS** | **non-ETS** |
| | **$CO_2$ equivalent (kt )** | | | | | | | | | **CO2 equivalent (Gg )** | |
| **Total (net emissions)[1]** | 22 153,89 | 4 660,99 | 2 640,20 | 933,34 | 161,46 | 56,76 | NO | NO | 30 606,63 | NA | |
| **1. Energy** | 33 250,06 | 1 025,94 | 220,09 | | | | | | 34 496,08 | **17 414,60** | **17 081,49** |
| A. Fuel combustion (sectoral approach) | 32 429,30 | 489,91 | 219,32 | | | | | | 33 138,52 | 16 766,21 | **16 372,31** |
| 1. Energy industries | 14 401,70 | 120,35 | 32,88 | | | | | | 14 554,93 | 14 078,68 | **476,25** |
| 2. Manufacturing industries and construction | 2 857,11 | 12,42 | 34,81 | | | | | | 2 904,33 | 2 687,53 | **216,80** |
| 3. Transport | 11 728,11 | 143,56 | 115,32 | | | | | | 11 986,99 | 0,00 | **11 986,99** |
| 4. Other sectors | 2 630,04 | 208,54 | 34,40 | | | | | | 2 872,98 | 0,00 | **2 872,98** |
| 5. Other | 98,34 | 0,04 | 0,91 | | | | | | 99,29 | 0,00 | **99,29** |
| B. Fugitive emissions from fuels | 1 534,77 | 541,03 | 1,77 | | | | | | 2 077,57 | 644,75 | **1 432,82** |
| 1. Solid fuels | 8,52 | 70,02 | 0,00 | | | | | | 78,55 | 0,00 | **78,55** |
| 2. Oil and natural gas | 1 522,60 | 471,01 | 1,77 | | | | | | 1 995,38 | 644,75 | **1 350,63** |
| C. $CO_2$ transport and storage | 3,64 | | | | | | | | 3,64 | 3,64 | **0,00** |
| **2. Industrial processes and product use** | 7 935,05 | 21,12 | 229,49 | 933,34 | 161,46 | 56,76 | NO | NO | 9 337,22 | **6 312,93** | **3 024,30** |
| A. Mineral industry | 967,26 | | | | | | | | 967,26 | 954,22 | **13,04** |
| B. Chemical industry | 1 799,94 | 19,77 | 210,45 | NO | NO | NO | NO | NO | 2 030,16 | 374,81 | **1 655,35** |
| C. Metal industry | 4 836,41 | 1,35 | 4,78 | NO | 161,42 | NO | NO | NO | 5 003,96 | 4 974,61 | **29,35** |
| D. Non-energy products from fuels and solvent use | 216,78 | NA | NA | | | | | | 216,78 | 0,00 | **216,78** |
| E. Electronic Industry | | | | | | 1,14 | NO | NO | 1,14 | 0,00 | **1,14** |
| F. Product uses as ODS substitutes | | | | 933,34 | 0,04 | | | | 933,37 | 0,00 | **933,37** |
| G. Other product manufacture and use | NO | NO | 14,26 | | | 55,62 | | | 69,88 | 0,00 | **69,88** |
| H. Other | 114,67 | NA | NA | | | | | | 114,67 | 9,28 | **105,39** |
| **3. Agriculture** | 97,25 | 2 569,67 | 1 769,78 | | | | | | 4 436,69 | | |
| A. Enteric fermentation | | 2 237,75 | | | | | | | 2 237,75 | | |
| B. Manure management | | 329,04 | 151,78 | | | | | | 480,82 | | |
| C. Rice cultivation | | NO | | | | | | | NO | | |
| D. Agricultural soils | | NE | 1 617,11 | | | | | | 1 617,11 | | |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO | | |
| F. Field burning of agricultural residues | | 2,88 | 0,89 | | | | | | 3,77 | | |
| G. Liming | 97,17 | | | | | | | | 97,17 | | |
| H. Urea application | 0,08 | | | | | | | | 0,08 | | |
| I. Other carbon-containing fertilizers | NO | | | | | | | | NO | | |
| J. Other | NO | NO | NO | | | | | | NO | | |
| **4. Land use, land-use change and forestry[1]** | -19 129,42 | 161,15 | 319,32 | | | | | | -18 648,95 | | |
| A. Forest land | -23 599,46 | 56,89 | 276,96 | | | | | | -23 265,61 | | |
| B. Cropland | 2 214,40 | 91,00 | 2,31 | | | | | | 2 307,71 | | |
| C. Grassland | 168,64 | 11,61 | 3,23 | | | | | | 183,48 | | |
| D. Wetlands | 19,89 | 1,64 | 0,28 | | | | | | 21,81 | | |
| E. Settlements | 2 541,11 | NO | 36,54 | | | | | | 2 577,65 | | |
| F. Other land | NO | NO | NO | | | | | | NO | | |
| G. Harvested wood products | -474,00 | | | | | | | | -474,00 | | |
| H. Other | NO | NO | NO | | | | | | NO | | |
| **5. Waste** | 0,95 | 883,12 | 101,52 | | | | | | 985,59 | | |
| A. Solid waste disposal | 0,00 | 795,09 | | | | | | | 795,09 | | |
| B. Biological treatment of solid waste | | 37,77 | 23,45 | | | | | | 61,21 | | |
| C. Incineration and open burning of waste | 0,95 | 0,12 | 0,02 | | | | | | 1,09 | | |
| D. Waste water treatment and discharge | | 50,15 | 78,05 | | | | | | 128,20 | | |
| E. Other | NO | NO | NO | | | | | | NO | | |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | |

| **Memo items:[2]** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 1 497,67 | 85,10 | 29,19 | | | | | | 1 611,96 | | |
| Aviation | 530,40 | 0,12 | 8,75 | | | | | | 539,27 | | |
| Navigation | 967,27 | 84,98 | 20,44 | | | | | | 1 072,69 | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | 4 928,53 | | | | | | | | 4 928,53 | | |
| **$CO_2$ captured** | 1 082,40 | | | | | | | | 1 380,68 | | |
| **Long-term storage of C in waste disposal sites** | 26 628,07 | | | | | | | | 26 628,07 | | |
| **Indirect $N_2O$** | | | 453,33 | | | | | | | | |
| **Indirect $CO_2$ [3]** | NE | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 48 969,71 | 23 727,52 | 25 242,18 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 30 320,75 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 49 255,59 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | 30 606,63 | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and

(2) See footnote 7 to table Summary 1.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| 1. For LULUCF, the data for 2020 is not ready. Therefore, the reported numbers are from 2019. 2. With regards to indirect CO2, they are an integral part of the emission estimates for each source category at the most dissaggregated level. Please see NIR chapter 9.3 for further details. Preliminary estimates for 2020 are 285.88 kt CO2. The split in row 66 between ETS and non-ETS does not include these indirect CO2 emissions, but these are included in row 68 which is the apprpriate national total for Norway. 3. Please note that the t-1 emissions reported here are not directly comparable to the t-3 emissions reported to the UNFCCC in April. An error has been discovered in the inventory that will increase the previously reported emisisons in 2019 with about 1400 kt CO2 equivalents. The error has been corrected for the 2020 emisisons reported here. 4. Nevertheless, taking the corrections into account, the 2020 emissions are estimated to be about 1700 kt CO2 eq lower than the 2019 emissions. These reductions are primarily within oil and gas extraction, industry, road traffic and aviation. 5. 2019 figures used for memo item on "Long-term storage of C in waste disposal sites". |

| SUMMARY 2 SUMMARY REPORT FOR $CO_2$ EQUIVALENT EMISSIONS | | | | | | | | Year | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Sheet 1 of 1) | | | | | | | | Submission | 2021 | | |
| | | | | | | | | Country | Switzerland | | |
| | | | | | | | | Geographical scope[4] | Switzerland | | |
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$[1] | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ | Unspecified mix of HFCs and PFCs | $NF_3$ | Total | ETS | non-ETS |
| | $CO_2$ equivalent (kt) | | | | | | | | | CO2 equivalent (Gg) | |
| **Total (net emissions)[1]** | 34 301,99 | 4 618,00 | 3 016,98 | 1 369,10 | 31,10 | 85,70 | 0,00 | 0,50 | 43 423,38 | | |
| **1. Energy** | 32 193,20 | 264,68 | 245,58 | | | | | | 32 703,46 | NE | |
| A. Fuel combustion (sectoral approach) | | | | | | | | | | | |
| 1. Energy industries | | | | | | | | | | | |
| 2. Manufacturing industries and construction | | | | | | | | | | | |
| 3. Transport | | | | | | | | | | | |
| 4. Other sectors | | | | | | | | | | | |
| 5. Other | | | | | | | | | | | |
| B. Fugitive emissions from fuels | | | | | | | | | | | |
| 1. Solid fuels | | | | | | | | | | | |
| 2. Oil and natural gas | | | | | | | | | | | |
| C. $CO_2$ transport and storage | | | | | | | | | | | |
| **2. Industrial processes and product use** | 2 043,14 | 2,94 | 605,12 | 1 369,10 | 31,10 | 85,70 | NO | 0,50 | 4 137,60 | NE | |
| A. Mineral industry | | | | | | | | | | | |
| B. Chemical industry | | | | | | | | | | | |
| C. Metal industry | | | | | | | | | | | |
| D. Non-energy products from fuels and solvent use | | | | | | | | | | | |
| E. Electronic Industry | | | | | | | | | | | |
| F. Product uses as ODS substitutes | | | | | | | | | | | |
| G. Other product manufacture and use | | | | | | | | | | | |
| H. Other | | | | | | | | | | | |
| **3. Agriculture** | 44,85 | 3 856,86 | 1 927,54 | | | | | | 5 829,24 | | |
| A. Enteric fermentation | | | | | | | | | | | |
| B. Manure management | | | | | | | | | | | |
| C. Rice cultivation | | | | | | | | | | | |
| D. Agricultural soils | | | | | | | | | | | |
| E. Prescribed burning of savannas | | | | | | | | | | | |
| F. Field burning of agricultural residues | | | | | | | | | | | |
| G. Liming | | | | | | | | | | | |
| H. Urea application | | | | | | | | | | | |
| I. Other carbon-containing fertilizers | | | | | | | | | | | |
| J. Other | | | | | | | | | | | |
| **4. Land use, land-use change and forestry[1]** | NE | NE | NE | | | | | | NE | | |
| A. Forest land | | | | | | | | | | | |
| B. Cropland | | | | | | | | | | | |
| C. Grassland | | | | | | | | | | | |
| D. Wetlands | | | | | | | | | | | |
| E. Settlements | | | | | | | | | | | |
| F. Other land | | | | | | | | | | | |
| G. Harvested wood products | | | | | | | | | | | |
| H. Other | | | | | | | | | | | |
| **5. Waste** | 9,06 | 492,90 | 238,21 | | | | | | 740,17 | | |
| A. Solid waste disposal | | | | | | | | | | | |
| B. Biological treatment of solid waste | | | | | | | | | | | |
| C. Incineration and open burning of waste | | | | | | | | | | | |
| D. Waste water treatment and discharge | | | | | | | | | | | |
| E. Other | | | | | | | | | | | |
| **6. Other** ***(as specified in summary 1.A)*** | 11,75 | 0,63 | 0,53 | NO | NO | NO | NO | NO | 12,90 | NE | |
| | | | | | | | | | | | |
| **Memo items:[2]** | | | | | | | | | | | |
| **International bunkers** | NE | NE | NE | | | | | | NE | | |
| Aviation | | | | | | | | | | | |
| Navigation | | | | | | | | | | | |
| **Multilateral operations** | NO | NO | NO | | | | | | NO | | |
| **$CO_2$ emissions from biomass** | NE | | | | | | | | | | |
| **$CO_2$ captured** | NO | | | | | | | | | | |
| **Long-term storage of C in waste disposal sites** | NE | | | | | | | | | | |
| **Indirect $N_2O$** | | | 235,54 | | | | | | | | |
| **Indirect $CO_2$[3]** | 121,68 | | | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 43 423,38 | NE | |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | NE | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | 43 545,06 | | |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NE | | |

(1) For carbon dioxide ($CO_2$) from land use, land-use change and forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and

(2) See footnote 7 to table Summary 1.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

(4) Where applicable: for Member States with geographical scopes which differ between the Kyoto Protocol, the EU-territory scope, and the Party coverage under the Convention, please clarify the geographical scope of the Proxy GHG inventory submitted under the EU Monitoring Mechanism Regulation.

| Brief description of the key drivers underpinning the increase or decrease in GHG emissions in t-1 (proxy) compared to t-2 (inventory). If this information is publicly available please include the hyperlink to the relevant website. |
| --- |
| The Swiss Kyoto target includes emissions of all greenhouse gases from the sectors 1, 2, 3 and 5, including indirect CO2 emissions from these sectors, excluding direct and indirect emissions from sector 6, excluding emissions and removals from land use, land-use change and forestry, and excluding emissions from international transport.<br>Indirect CO2 emissions from sector 6 account for 1.13 kt (and are included in the 121.68 kt indicated above as total indirect CO2 emissions).<br>Note, indirect N2O emissions are estimated but are not included in the Swiss Kyoto target.<br>Total approximated CO2 equivalent emissions in 2020 according to the Swiss Kyoto target are 43'531.03 kt.<br><br>Swiss climate reporting under the UNFCCC:<br>http://www.climatereporting.ch<br><br>In the different sectors, emission changes from 2019 to 2020 were mainly caused by the following drivers:<br><br>Sector 1 'Energy'<br>Lower Fuel Combustion (1A) is mainly driven by the pandemic measures concerning transport. CO2 emissions from fuels (1A3) fell by around 1 million tonnes or 8 per cent compared to the previous year.<br>Furthermore, only slightly lower fuel combustion due to efficiency improvements and increasing usage of renewable energy for heating in 1A4bi Stationary Combustion, further supported by somewhat warmer winter weather.<br><br>Sector 2 'Industrial processes and product use'<br>Slightly decreased CO2 emissions from cement production (based on data from cement plants).<br><br>Sector 3 'Agriculture'<br>The approximated emission estimate considered preliminary new data for aggregated animal numbers, updated milk production, and estimates on mineral fertilizers.<br><br>Sector 5 'Waste'<br>Reduced emissions of CH4 from waste disposal sites (based on model simulations, disposal of burnable solid waste is prohibited since the year 2000). |

## Annex 2: List of abbreviations

| | |
|---|---|
| AR4 | IPCC Fourth Assessment Report: Climate Change 2007 |
| BP | British Petroleum |
| $CH_4$ | Methane |
| $CO_2$ | Carbon dioxide |
| $CO_2$ eq. | Carbon dioxide equivalent |
| CRF | Common reporting format |
| EC | European Commission |
| EEA | European Environment Agency<br>The EEA has 32 member countries: the 27 European Union Member States together with Iceland, Liechtenstein, Norway, Switzerland and Turkey |
| ESD | Effort Sharing Decision |
| ETC/CME | European Topic Centre for Climate Change Mitigation and Energy |
| ETS | Emissions Trading System |
| EU | European Union |
| EU27 | Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden |
| EUTL | European Union Transaction Log |
| F-gas | Fluorinated greenhouse gas; umbrella term including HFC, PFC, $SF_6$ and $NF_3$ |
| GDP | Gross domestic product |
| GHG | Greenhouse gas |
| GWP | Global warming potential |
| HDD | Heating degree days |
| HFCs | Hydrofluorocarbons |
| IEA | International Energy Agency |
| IEF | Implied emission factor |
| kt | Kilotons (thousand tons) |
| IPCC | Intergovernmental Panel on Climate Change |
| IPPU | Industrial processes and product use |
| LULUCF | Land use, land-use change and forestry |
| MMR | Monitoring Mechanism Regulation (Regulation (EU) 2018/1999) |
| Mt | Megatons (million tons) |
| $N_2O$ | Nitrous oxide |
| $NF_3$ | Nitrogen trifluoride |
| ODS | Ozone-depleting substance |
| PEC | Primary Energy Consumption |
| PFCs | Perfluorocarbons |
| QA/QC | Quality assurance and quality control |
| QELRC | Quantified emission limitation and reduction commitment |
| $SF_6$ | Sulphur Hexafluoride |
| UNFCCC | United Nations Framework Convention on Climate Change |

## Annex 3: Abbreviations of member states and EEA countries included in this report

| | |
|---|---|
| AT | Austria |
| BE | Belgium |
| BG | Bulgaria |
| CH | Switzerland |
| CY | Cyprus |
| CZ | Czechia |
| DE | Germany |
| DK | Denmark |
| EE | Estonia |
| ES | Spain |
| FI | Finland |
| FR | France |
| GR | Greece |
| HR | Croatia |
| HU | Hungary |
| IE | Ireland |
| IT | Italy |
| IS | Iceland |
| LT | Lithuania |
| LU | Luxembourg |
| LV | Latvia |
| MT | Malta |
| NL | Netherlands |
| NO | Norway |
| PL | Poland |
| PT | Portugal |
| RO | Romania |
| SE | Sweden |
| SI | Slovenia |
| SK | Slovakia |
| UK | United Kingdom |
| CH | Switzerland |
| NO | Norway |
| IS | Iceland |

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