

Approximated EU greenhouse gas inventory

Proxy GHG emission estimates for 2019



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Contents

1	Background and objective.....	1
2	European GHG emissions in 2019.....	2
2.1	Trend and overall results.....	3
2.1.1	Changes in GHG emissions across the EU.....	3
2.1.2	Changes in EU GHG emissions by sector	4
2.1.3	Changes in member states GHG emissions 2018 to 2019.....	6
2.1.4	Changes in member states GHG emissions 1990 to 2019.....	10
2.1.5	Detailed results for the EU27 + UK and EU-KP	12
2.2	Sectoral results.....	15
2.2.1	Energy.....	15
2.2.2	Industrial Processes and Product Use	17
2.2.3	Agriculture	18
2.2.4	Waste.....	19
2.3	ETS versus ESD emissions.....	20
3	Performance of last year’s EU proxy.....	23
3.1	Difference between MS proxy and final GHG inventories	24
3.2	Sectoral differences between proxy and final GHG inventories	26
4	Methodologies and data sources at Member State level.....	29
4.1	Description of different approaches	29
4.2	MS proxies submitted under the EEA MMR.....	30
4.3	Gap-filling for MS not submitting a proxy inventory.....	30
4.3.1	CO ₂ emissions from 1. Energy subsectors	31
4.3.2	IPPU emissions from mineral and metal industries.....	32
4.3.3	Other emissions.....	32
4.4	Methodology for gap-filling of partially complete proxy submissions.....	32
4.4.1	Total CO ₂ eq., including indirect CO ₂ , without LULUCF in ETS and non-ETS.....	33
4.4.2	F-gases	33
4.4.3	Romania.....	33
4.4.4	Sweden	33
4.4.5	United Kingdom.....	33
5	References.....	35
	Annex 1: Detailed results for each Member State	36
	Austria (submitted by member state)	37
	Belgium (submitted by member state).....	39
	Bulgaria (EEA calculation).....	41

Cyprus (EEA calculation)	42
Czechia (submitted by member state)	43
Germany (submitted by member state)	45
Denmark (submitted by member state)	47
Estonia (submitted by member state)	49
Spain (submitted by member state)	51
Finland (submitted by member state)	53
France (submitted by member state)	55
Greece (submitted by member state)	56
Croatia (submitted by member state)	58
Hungary (submitted by member state)	60
Ireland (submitted by member state)	62
Italy (submitted by member state)	64
Lithuania (submitted by member state)	66
Luxembourg (submitted by member state)	68
Latvia (submitted by member state)	70
Malta (submitted by member state)	72
Netherlands (submitted by member state)	74
Poland (submitted by member state)	75
Portugal (submitted by member state)	76
Romania (submitted by member state)	78
Sweden (submitted by member state)	79
Slovenia (submitted by member state)	81
Slovakia (submitted by member state)	83
United Kingdom (submitted by country)	85
Iceland (submitted by country)	87
Norway (submitted by country)	88
Switzerland (submitted by country)	89
Turkey (submitted by country)	91
Annex 2: List of abbreviations	92
Annex 3: Abbreviations of member states and EEA countries included in this report	93

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Executive summary

This report provides GHG emissions estimates for the EU27+UK and EU27 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.

For EU27+UK the emissions have decreased by 162.6 million tonnes of CO₂ equivalents, or 3.8% (total GHG emissions without LULUCF, including indirect CO₂, without international aviation) between 2018 and 2019. International aviation equalled for EU27+UK to 172.1 million tonnes of CO₂ equivalents in 2019, which is about 3.8% higher than in 2018. Emissions including international aviation across the EU27+UK decreased by 3.6% compared to 2018. This is a reduction of 26.0% when compared to 1990. Table ES 1 provides details on the total levels of emissions including international aviation.

It is important to note, that despite there being no recession, we are experiencing one of largest emission reductions ever in the EU. As it is mentioned further, the ETS emissions (mostly covering emissions from electricity and heat production) have decreased much more than the ESD emissions (where actually emissions from transport increased).

The changes in 2019 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 2019 also follow the weather conditions, in particular warm temperatures during the year affected released emissions from Energy sector.

The emissions estimates for 2019 are not affected by the COVID19 pandemic and therefore show that the EU has reduced emissions substantially due to several other factors that are explained below.

Table ES 1 Emissions including international aviation (kt CO₂ eq.)

European Union (EU27+UK)	1990	2018	2019	2019-2018	2019/2018	2019-1990	2019/1990
Total excl. LULUCF incl. indirect CO ₂	5 652 165	4 225 970	4 063 371	-162 599	-3.85%	-1 588 794	-28.11%
International aviation	69 206	165 871	172 113	6 242	3.76%	102 907	148.7%
Total CO ₂ eq. including international aviation	5 721 371	4 391 841	4 235 483	-156 358	-3.56%	-1 485 887	-25.97%
European Union plus Iceland (EU - KP)							
Total excl. LULUCF incl. indirect CO ₂	5 655 897	4 230 827	4 068 155	-162 672	-3.84%	-1 587 742	-28.07%
International aviation	69 427	167 175	173 077	5 902	3.53%	103 650	149.29%
Total CO ₂ eq. including international aviation	5 725 325	4 398 002	4 241 232	-156 769	-3.56%	-1 484 092	-25.92%
European Union (EU27)							
Total excl. LULUCF incl. indirect CO ₂	4 857 916	3 763 868	3 616 426	-147 442	-3.92%	-1 241 490	-25.56%
International aviation	53 715	129 227	133 046	3 818	2.95%	79 330	147.69%
Total CO ₂ eq. including international aviation	4 911 631	3 893 095	3 749 472	-143 623	-3.69%	-1 162 160	-23.66%

Changes in GHG emissions across the EU

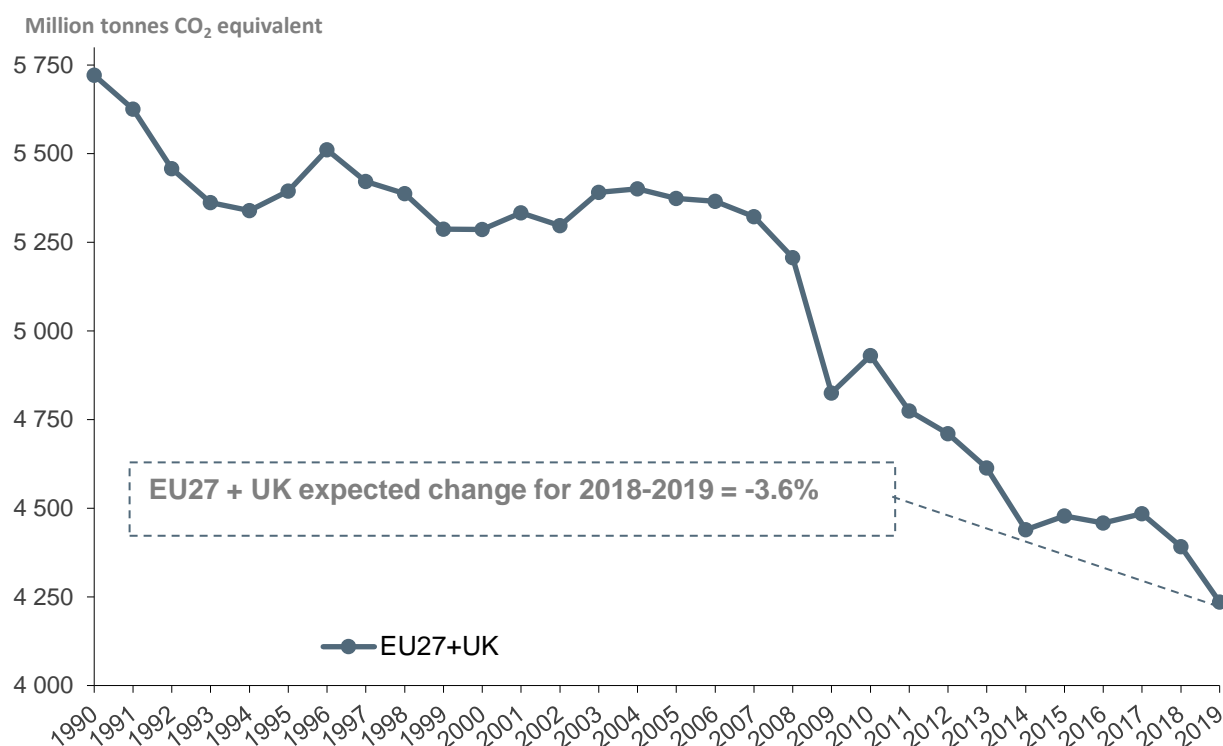
The estimates for 2019 indicate the decreasing trend of emissions reduction. Emissions levelled off between 2014 and 2016 (Figure ES 1), and the estimate for 2019 shows a 3.6% decrease compared to 2018 emissions level. Since the EU target is aimed on the emissions including international aviation, Figure ES 1 presents total emissions for EU27+UK including international aviation.

For EU27+UK the 2019 emissions equalled to 4235.5 million tonnes of CO₂ equivalents (Mt CO₂ eq.), which indicates a decrease from 2018 of 156.4 million tonnes of CO₂ equivalents (Mt CO₂ eq.), or 3.6%.

International aviation equalled for EU27+UK to 172.1 million tonnes of CO₂ equivalents in 2019, which shows an increase of 3.8% in comparison to the 2018 levels.

The 2019 emissions for EU-KP (4241 million tonnes of CO₂ equivalents (Mt CO₂ eq.), are lower than any preceding year. The decrease in emissions between 2018 and 2019 is estimated to be 156.8 Mt CO₂ eq. or 3.6 % (total GHG emissions without LULUCF and including indirect CO₂ and international aviation). The 2019 emissions total is 26.0 % below 1990 levels.

Figure ES 1 Trends in total GHG emissions, 1990-2019



Note: Total GHG emissions without LULUCF including indirect CO₂ and international aviation

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

The trend shows 3.8 % decrease in emissions for the EU-KP (total without international aviation) since 2018 while the GDP growth is showing positive trend of 1.5 % in the same year (Figure ES 2). If there is a common pattern between GDP and GHG emissions for 2019 across the EU, it is that for all Member States the economic situation improved again, nonetheless 22 Member States and UK achieved decreases in emissions. Even though there was positive GDP growth in all Member States, the economic situation in 2019 was not as good as in 2018, and, on average for the EU, GDP growth in 2019 was 0.5 percentage points lower than the 2% growth achieved in 2018. Lower economic activity can also partly explain lower emissions in 2019 compared to 2018, although it is not the main reason.

Climatic factors have a significant effect on energy demand and GHG emission trends. The exceptionally warm years were 2015, 2016, 2017, 2018, and especially 2019 was one of the three warmest years for Europe (Copernicus, 2020). Furthermore, a milder winter for 2018 was noted. The pattern in heating degree days confirms lower heating demand in 2019 compared to 2018. The highest amount of cooling degree days in 2019 was observed for Cyprus, Malta and Greece, as it is to be expected for these countries. Relatively cold period at the beginning of the years indicated also higher emissions from the

increased by 0.1%. Solid fossil fuel consumption (excluding peat) fell significantly by 17.4% (ETC energy efficiency proxy 2019, 2020)¹.

The emissions from the sector Industrial Processes and Product Use decreased by 1.8 % between 2018 and 2019 in the EU27+UK. The largest contribution to this emission decrease was from metal industry, which decreased by 3.7%.

Agriculture emissions decreased by 1.0% mainly from emission decreases from enteric fermentation, but also liming, urea application and other carbon containing fertilisers.

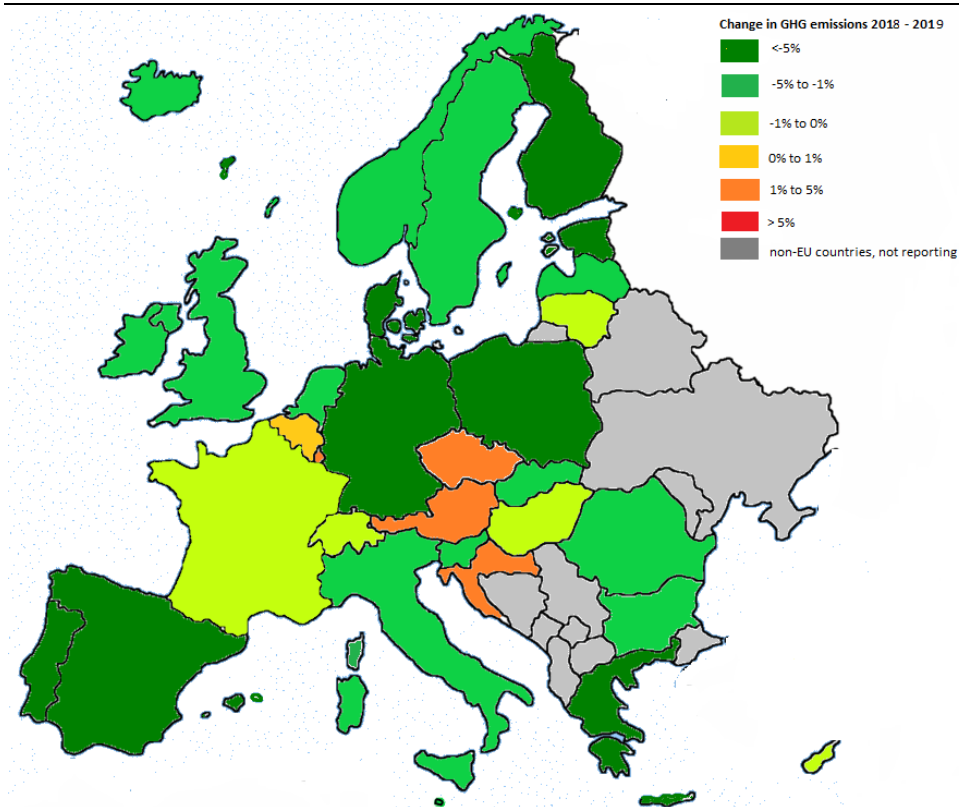
The trend in emissions from waste (-4.2 % compared to previous year) continues the decrease seen in previous years with largest reduction being in emissions from solid waste disposal.

Reporting under the Monitoring Mechanism Regulation requires separate detail for the EU ETS and non-ETS sectors. Between 2018 and 2019 the emissions decreased by 9.2 % across stationary installations covered by the European Emissions Trading System for the EU, whereas emissions covered by the Effort Sharing Decision (ESD) decreased by 0.4 %.

Changes in member state's GHG emissions

Greenhouse gas emissions increased in five EU Member States in 2019. 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 2018-2019



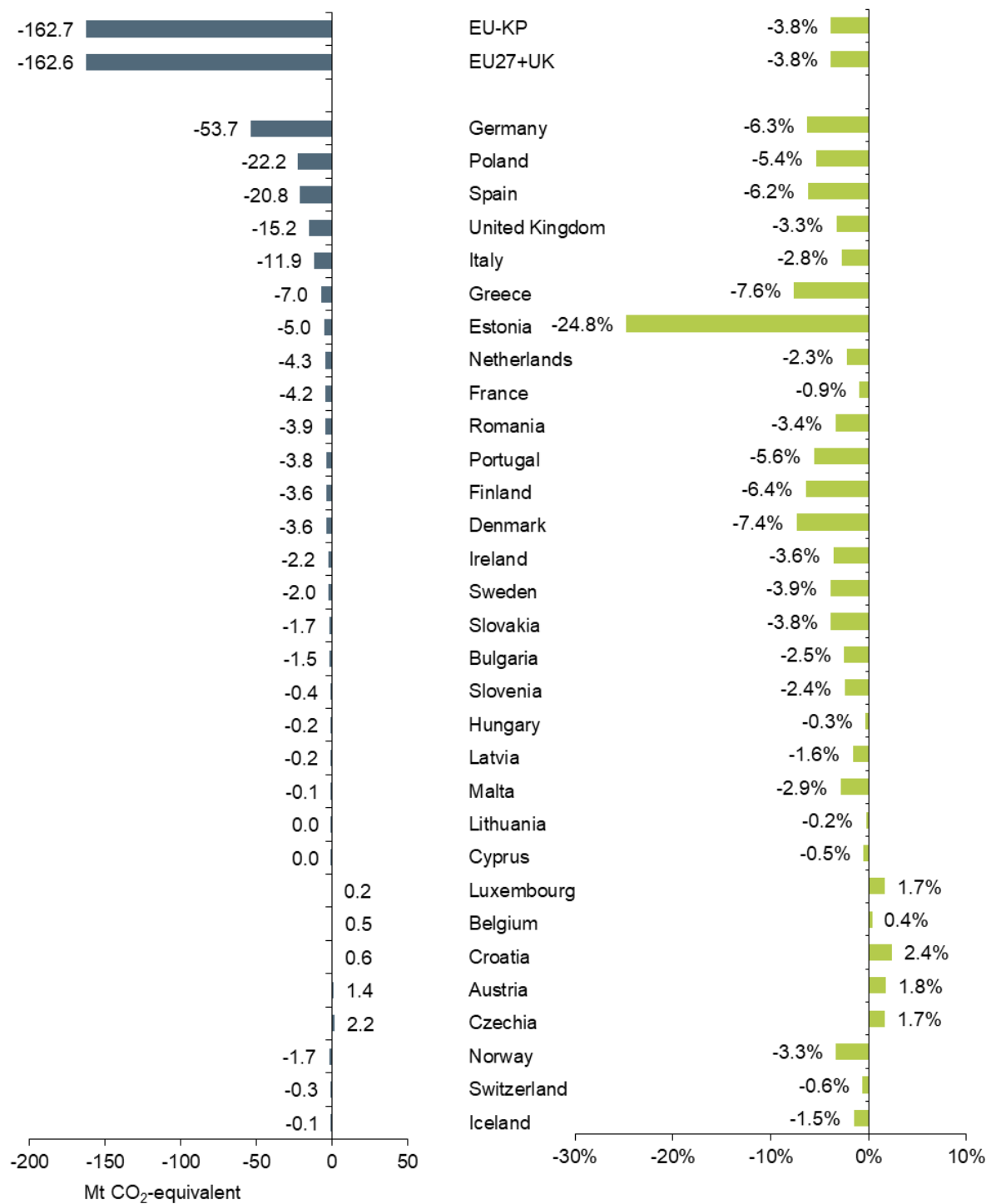
¹ ETC 2020, energy efficiency proxy 2019

Comparing the changes across Member States (Figure ES 4), the largest absolute emission change occurred in Germany, where emissions decreased by 53.7 Mt CO₂ eq. Apparent decrease in emissions occurred also for Poland (-22.2 Mt CO₂ eq.), Spain (-20.8 Mt CO₂ eq.) and Italy (-11.9 Mt CO₂ eq.).

The largest relative increase in emissions compared to the previous year took place in Croatia (2.4%) and Austria (1.8%). The largest relative declines were in Estonia (-24.8%) and Greece (-7.6%).

In the non-EU member countries of the EEA, emissions decreased in Switzerland (-0.6 %, or -0.3 Mt CO₂ eq.), the United Kingdom (-3.3% or -15.2 Mt CO₂ eq.), Iceland (-1.5 % or -0.1 Mt CO₂ eq.) and Norway (+3.3 % or -1.7 Mt CO₂ eq.).

Figure ES 4 Member States' emissions, change 2018-2019



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) 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions (EU MMR). Article 8 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 voluntarily 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 CO₂.

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 second commitment period of the Kyoto Protocol (2013–2020) was established in Doha in 2012 (COP 18/CMP8). The so-called Doha amendment includes new quantified emission limitation and reduction commitments (QELRCs) for Annex I Parties intending to take part in the second commitment period. The EU, its Member States (EU27+UK) and Iceland agreed to a joint QELRC, corresponding to a 20 % reduction compared to the base year. They declared that they intended to fulfil this commitment jointly, under Article 4 of the Kyoto Protocol². The Doha Amendment's entry into force is subject to acceptance by at least three quarters of the Parties to the Kyoto Protocol.

The official submission of 2019 inventories to the United Nations Framework Convention on Climate Change (UNFCCC) will take place in 2021.

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

² Submission by Denmark and the European Commission on behalf of the European Union and its Member States (19 April 2012): http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_eu_19042012.pdf
Submission by Iceland (10 May 2012), available at: <http://unfccc.int/resource/docs/2012/awg17/eng/misc01a01.pdf>

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	All gases and sectors (100% of emissions)	EU MMR (525/2013)
Approximated / Proxy GHG inventory	EEA, DG Climate Action	30 September	t-1	EU and its 27 Member States + UK, Iceland and other EEA member countries when available	All gases and sectors (100% of emissions) except LULUCF	EU MMR (525/2013)
EU ETS	DG Climate Action, EEA	Early April, May and summer (between July and September)	t-1	EU27+UK, Iceland, Norway and Liechtenstein	About 11,000 installations (~45% 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 2019

A total of twenty-five Member States submitted preliminary 2019 GHG data to the European Commission and the EEA by 31 July 2020³. Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom all submitted emissions data in the form of largely⁴ complete CRF Summary2 tables. The methodologies used for any gap-filling are described in chapter 4.4.1.

The United Kingdom submitted its approximated inventory for the EU coverage excluding Gibraltar.

These 26 countries that submitted 2019 proxy estimates represent more than 95 % of EU27+UK's total emissions.

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

Additionally three EEA member countries submitted preliminary 2019 GHG data by 31 July 2020: Iceland, Switzerland and Norway. Also Turkey has submitted by 12th August 2020 its preliminary estimates for the LULUCF sector for 2019.⁵

Approximated GHG inventories in CRF Summary2 table format are presented for the EU27+UK and EU-KP in chapter 2.1.5 **Error! Reference source not found.**

³ Where LULUCF data were provided, these data were not used, as for the approximated GHG inventories for EU27+UK and EU-KP, emissions from LULUCF are not calculated.

⁴ Where sub-sector emissions detail was not available it was gap-filled using simple allocation based on the previous year's splits. In some instances sub-sectors emissions needed to be summed for sectors. These minor modifications were performed for Denmark, Germany, Greece, Hungary, Ireland, Luxembourg, Sweden and the United Kingdom.

⁵ Other non-EU Member State of the EEA is Liechtenstein. As this country did not submit any GHG data for 2019, it is not considered in this report.

Annex 1: Detailed results for each Member State provides the CRF Summary2 tables for each of the 27+UK EU Member States and also for Iceland, Switzerland, Norway and Turkey.

2.1 Trend and overall results

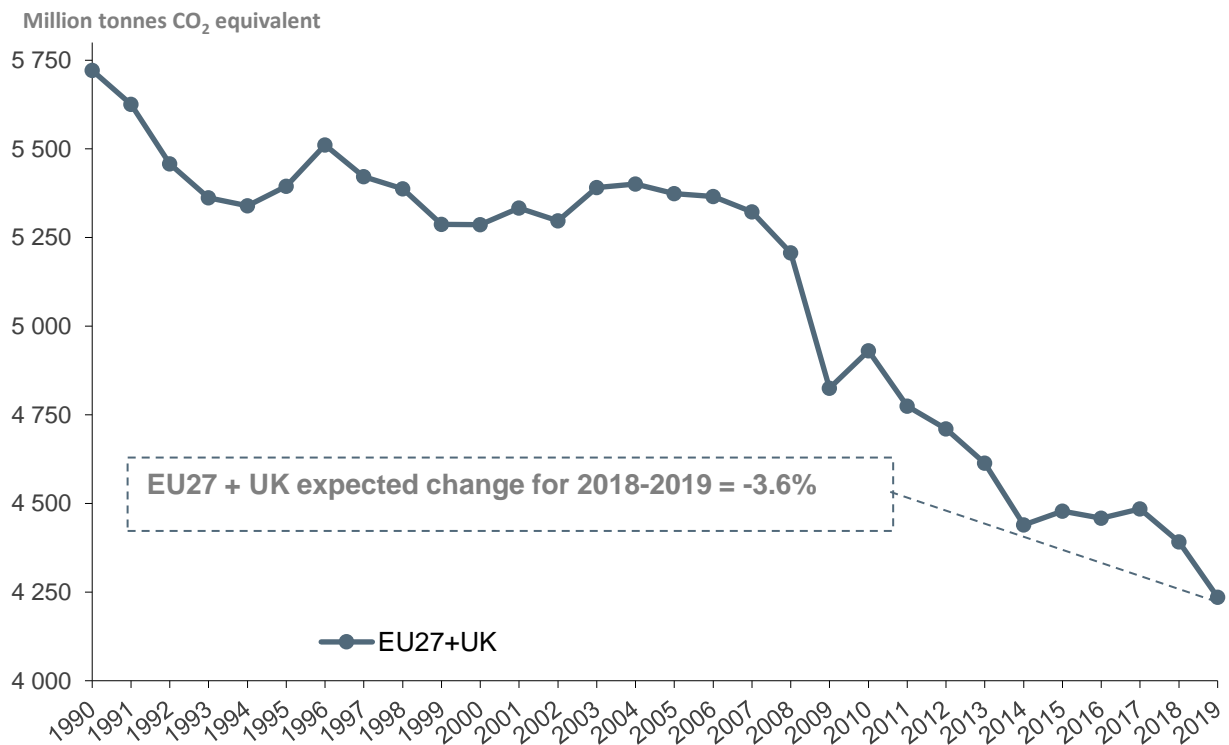
2.1.1 Changes in GHG emissions across the EU

The estimates for 2019 indicate the decreasing trend of emissions reduction. Emissions levelled off between 2014 and 2016 (Figure 2-1), and the estimate for 2019 shows a 3.6% decrease compared to 2018 emissions level. Since the EU target is aimed on the emissions including international aviation, Figure 2-1 is presenting total emissions for EU27+UK including international aviation.

For EU27+UK the 2019 emissions equalled to 4235.5 million tonnes of CO₂ equivalents (Mt CO₂ eq.), which indicates a decrease from 2018 of 156.4 million tonnes of CO₂ equivalents (Mt CO₂ eq.), or 3.6%. International aviation equalled for EU27+UK to 172.1 million tonnes of CO₂ equivalents in 2019, which shows an increase of 3.8% in comparison to the 2018 levels.

The 2019 emissions for EU - KP (4241 million tonnes of CO₂ equivalents (Mt CO₂ eq.)), are lower than any preceding year. The decrease in emissions between 2018 and 2019 is estimated to be 156.8 Mt CO₂ eq. or 3.6 % (total GHG emissions without LULUCF and including indirect CO₂ and international aviation). The 2019 emissions total is 26.0 % below 1990 levels.

Figure 2-1 Trends in total GHG emissions, 1990-2019

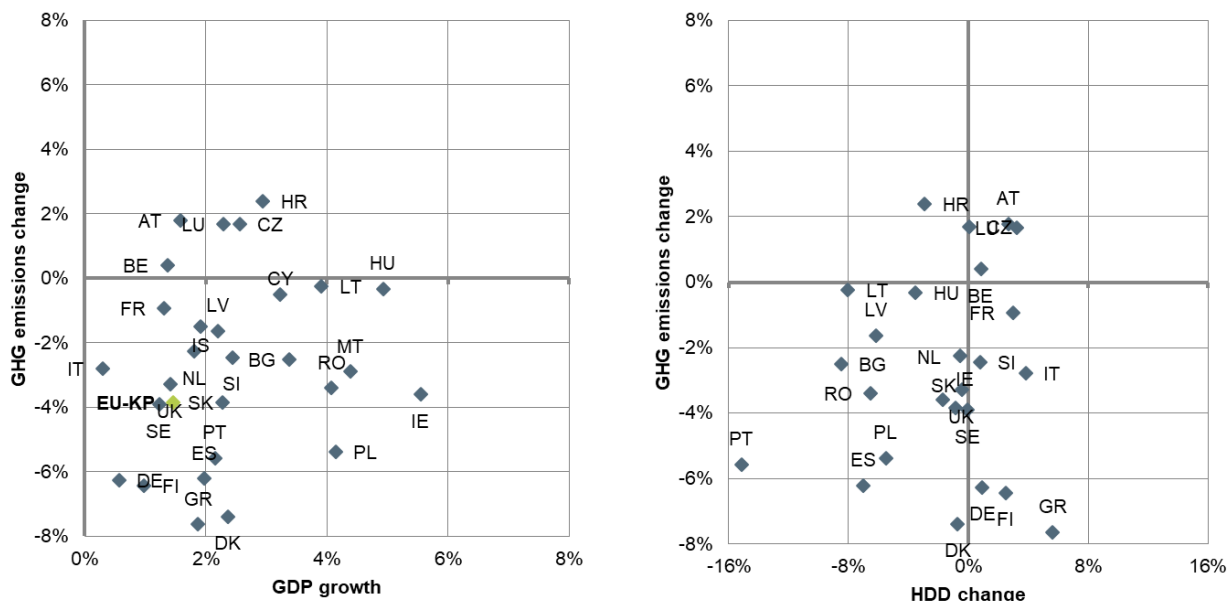


Note: Total GHG emissions without LULUCF including indirect CO₂ and international aviation.

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

The trend shows 3.8 % decrease in emissions for the EU-KP (total without international aviation) since 2018 while the GDP growth is showing positive trend of 1.5 % in the same year (Figure 2-2). If there is a common pattern between GDP and GHG emissions for 2019 across the EU, it is that for all Member States the economic situation improved again nonetheless 22 Member States and UK achieved decreases in emissions. Even though there was positive GDP growth in all Member States, the economic situation in 2019 was less good than in 2018, and, on average for the EU, GDP growth in 2019 was 0.5 percentage points lower than the 2% growth achieved in 2018. Lower economic activity can also partly explain lower emissions in 2019 compared to 2018, although it is not the main reason.

Figure 2-2 GHG emissions, GDP growth and heating degree days change 2018-2019



Note: Heating Degree Days (HDDs) are an indication of heat demand based on outdoor temperatures. Positive HDD change can correlate with increased heating demand. The HDD value of Malta and Cyprus could not be presented at this scale. Malta has HDD change of 40.9% and Cyprus has 47.2%.

The graphs are not presenting data for Estonia due to relatively high change in the GHG emissions for Estonia (-24.8%).

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+UK. 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 and especially 2019 was one of the three warmest years for Europe (Copernicus, 2020). Further, milder winter for 2018 was noted. The pattern in heating degree days confirms lower heating demand in 2019 compared to 2018. The highest amount of cooling degree days in 2019 was observed for Cyprus, Malta and Greece, as it is to be expected for these countries. Relatively cold period at the beginning of the years indicated also higher emissions from the residential and commercial sectors. Figure 2-2 also shows that the 4 Member States with increases in heating degree days (a standardized measure for linking heating demand and weather conditions) are not necessarily identical to those Member States where total emissions also increased.

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 145.9 Mt CO₂ eq. (-4.4 %) across the EU. Within the energy sector, emissions increased in transport (+0.7 Mt CO₂ eq.), particularly road transport, while they declined in energy industries (-122.8 Mt CO₂ eq.), particularly in

heat and electricity production, in residential and commercial (-3.2 Mt CO₂ eq.), in manufacturing industries and construction (-16.3 Mt CO₂ eq.) and in fugitive emissions from fuels (-4.4 Mt CO₂ eq.).

These changes in emissions in 2019 reflect by and large changes in the fuel mix. Primary fossil energy consumption decreased again in 2019, and the contribution of coal to the energy mix decreased in 2019 while the share of gas and renewable fuels increased⁶. Wind and solar contributed the most to the increase in renewable electricity, solid biofuels increased slightly while hydro stayed stagnant.⁷ Primary energy consumption of nuclear energy decreased slightly.

Consumption of coal, oil, gas and nuclear energy are primary energy consumption values from the ETC energy efficiency proxy 2019. Renewable energy values are from the ETC RES proxy 2019. Hydro and wind are normalised.

Consumption data for solid, liquid and gaseous fuels, show different trends for the different fossil fuel types. In 2019 the consumption of natural gas rose by 2.8% and consumption of liquid fuels increased by 0.1%. Solid fossil fuel consumption (excluding peat) fell by 17.4%.

The gaseous fuels consumption increased in nineteen Member States with highest increases in Spain (14.0%), Greece (9.0%) and Portugal (5.1%).

In seven Member States gaseous fuels consumption fell with the largest decrease in Estonia (-8.0%) followed by Denmark (-8.0%) and Bulgaria (-5.7%).

Liquid fossil consumption grew in eighteen Member States with the largest increases being in Portugal (9.9%), Malta (6.8%) and Bulgaria (3.2%). A decrease of liquid fuel consumption was observed in fifteen Member States with largest decreases in Slovenia (-7.4%), Slovakia (-4.5%) and Netherlands (-4.7%).

Nineteen Member States showed decreasing solid fossil fuel consumption (excluding peat). The largest decreases were in Spain (-54.6%), Portugal (-53.7%) and Denmark (-42.7). Consumption grew the most in Cyprus (22.7%), Croatia (15.9%) and Lithuania (13.9%). These changes in fossil fuel consumption are not only related to heating degree day (HDD) effects as described in section **Error! Reference source not found.** but also strongly connected to the trends in electricity generation from fossil fuels.

Renewable electricity generation continues to play an important role in GHG mitigation efforts by the EU and its Member States. Hydroelectric generation (without pumped storage) increased by 0.04% across the EU with twelve Member States experiencing higher hydro electricity production in 2019 than in 2018. Hydro production decreased in fifteen Member States. The largest absolute decreases in gross hydro production were in Portugal, Estonia and Latvia. The largest absolute increases in gross hydro production were in Slovenia, Hungary and Ireland.

Electricity production from renewable sources increased significantly. Gross electricity generation from wind energy grew by 9.5% in the EU across twenty four Member States. The largest relative increases were in Malta (33.3%), Belgium (20.1%) and Spain (19.9%). The largest absolute contributions from wind energy were in Germany, the United Kingdom and France.

Increases in electricity production from photovoltaics were seen in most Member States (25) and production grew by 7.1% across Europe, with very large relative increases in Latvia (146.4%), Poland (138.9%) and Hungary (123.6%). The largest absolute generation from photovoltaics was in Germany followed by Netherlands and Spain.

In 2019 nuclear energy production across the EU decreased by 0.4 % compared to 2018. The largest decreases in nuclear electricity generation occurred in United Kingdom (-13.6 %) followed by France (-3.4%) and Sweden (-2.6%). Nuclear electricity generation increased in Belgium (52.2%), the Netherlands (12.1%) and Finland (4.8%). The high increase in Belgium is explained by all the nuclear plants being back in grid from the maintenance operations.

⁶ ETC 2020, energy efficiency proxy 2019

⁷ ETC 2020, RES proxy 2019

The emissions from the sector Industrial Processes and Product Use decreased by 1.8 % between 2018 and 2019 in the EU27+UK. The largest contribution to this emission decrease was from metal industry, which decreased by 3.7%.

Agriculture emissions decreased by 1.0% mainly from emission decreases from enteric fermentation, but also liming, urea application and other carbon containing fertilisers.

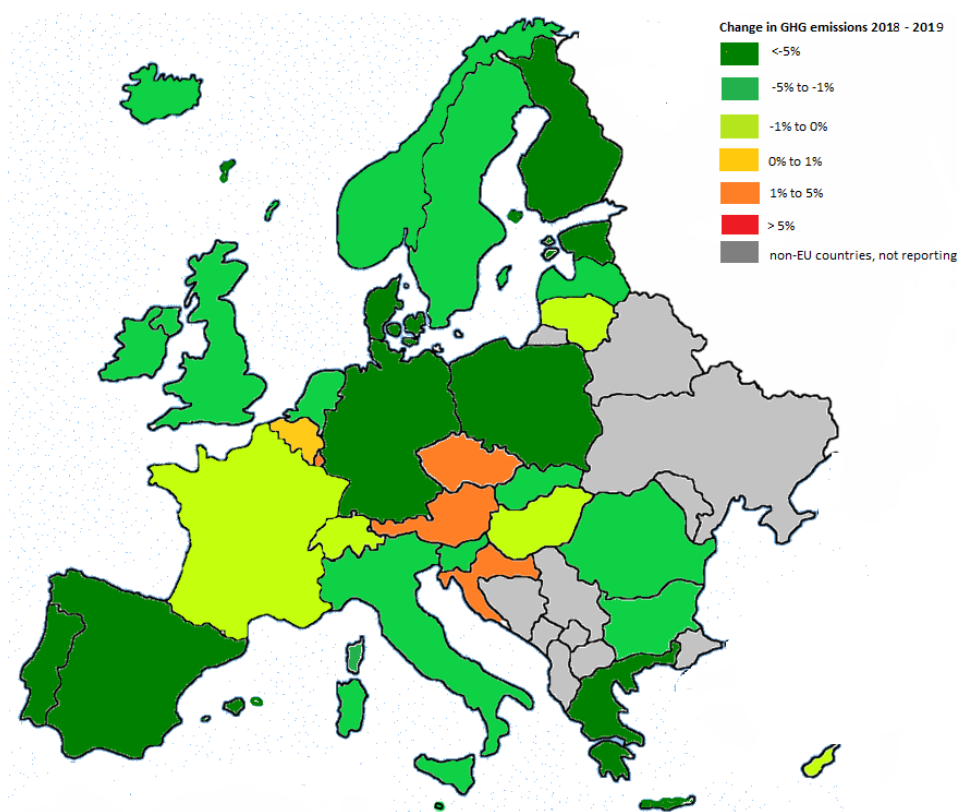
The trend in emissions from waste (-4.2 % compared to previous year) continues the decrease seen in previous years with largest reduction being in emissions from solid waste disposal.

Reporting under the Monitoring Mechanism Regulation requires separate detail for the EU ETS and non-ETS sectors. Between 2018 and 2019 the emissions decreased by 9.2 % across stationary installations covered by the European Emissions Trading System for the EU, whereas emissions covered by the Effort Sharing Decision (ESD) decreased by 0.4 %.

2.1.3 Changes in member states GHG emissions 2018 to 2019

Greenhouse gas emissions increased in five EU Member States with decreases outweighing gains by 3.8 %. 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 2018-2019

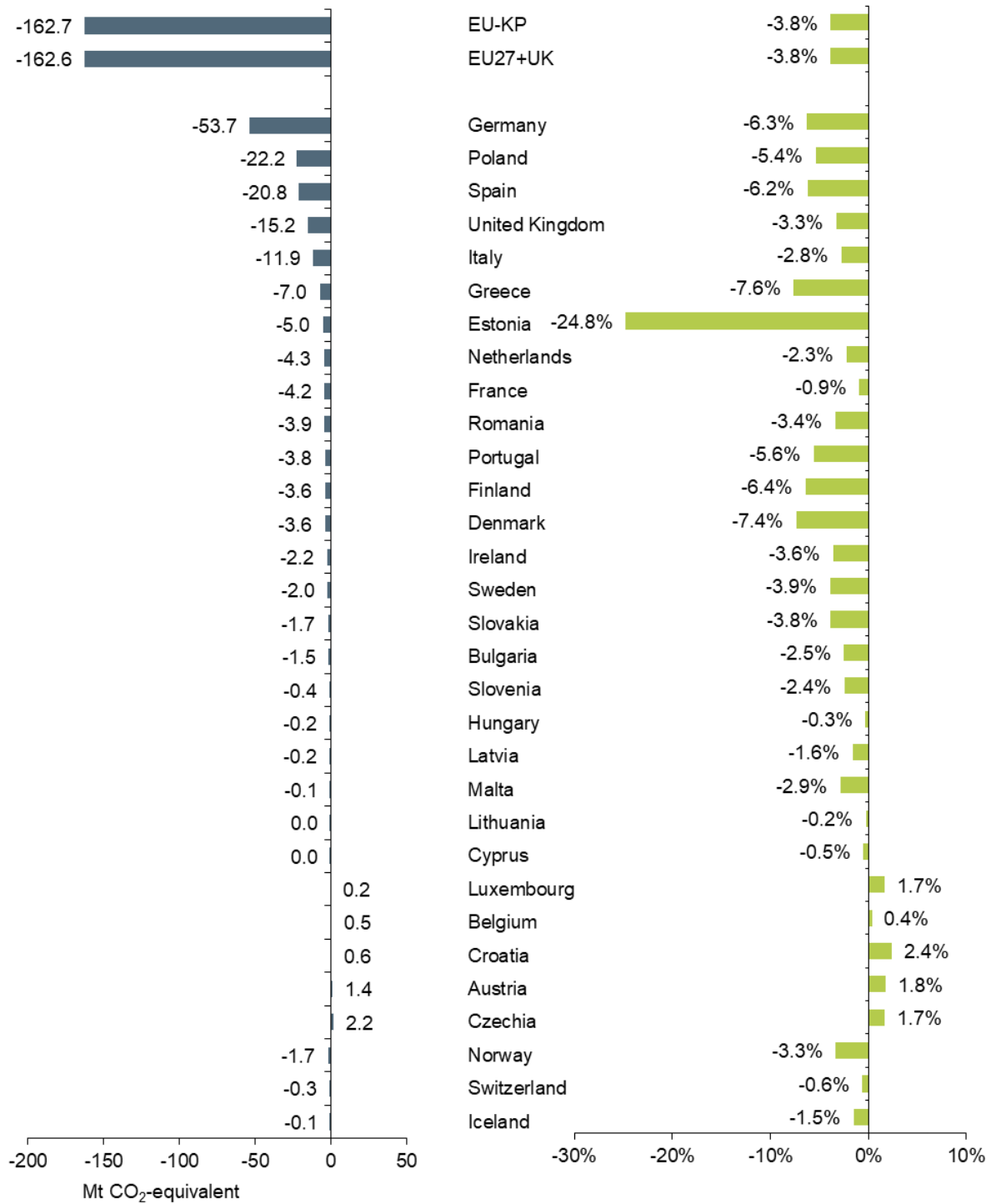


Comparing the changes across Member States (Figure 2-4), the largest absolute emission change occurred in Germany, where emissions decreased by 53.7 Mt CO₂ eq. Apparent decrease in emissions occurred also for Poland (-22.2 Mt CO₂ eq.), Spain (-20.8 Mt CO₂ eq.) and Italy (-11.9 Mt CO₂ eq.).

The largest relative increase in emissions compared to the previous year took place in Croatia (2.4%) and Austria (1.8%). The largest relative declines were in Estonia (-24.8%) and Greece (-7.6%).

In the non-EU member countries of the EEA, emissions decreased in Switzerland (-0.6 %, or -0.3 Mt CO₂ eq.), the United Kingdom (-3.3% or -15.2 Mt CO₂ eq.), Iceland (-1.5 % or -0.1 Mt CO₂ eq.) and Norway (-3.3 % or -1.7 Mt CO₂ eq.).

Figure 2-4 Member States' emissions, change 2018-2019



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

Member states with decreasing 2018 to 2019 emission trends

The largest absolute decrease was seen in Germany, the largest GHG emitter in the European Union. Emissions in Germany decreased by 53.7 Mt CO₂ eq. or 6.3%, significantly more than in any other Member State. Consumption of coal decreased by 20.5%, while consumption of natural gas increased by 3.3% and oil by 2.0%. Consumption of renewable energies including hydro increased 3.3%, while nuclear energy slightly decreased by 1.1%. The largest share of the emissions decrease was in sub-category 1.A.1 Energy industries (-49.37 Mt CO₂ eq. or -16.7%) followed by 1.A.4 Other sectors (-5.06 Mt CO₂ eq. or -4.1 %). Emissions of Industrial processes and product use decreased by 1.62 Mt CO₂ eq. (-2.5 %), mainly from metal industry. Emissions of Agriculture decreased by 1.69 Mt CO₂ eq. or 2.7 % and emissions from Waste are estimated to fall by 0.5 Mt CO₂ eq. or 4.7 %. Consumption of coal, oil, gas and nuclear energy are primary energy consumption values from the ETC energy efficiency proxy 2019.⁸ Renewable energy including hydro is from the ETC RES proxy 2019.⁹

In Poland, GHG emissions declined by 22.19 Mt CO₂ eq. or 5.4 %. There has been a strong decline in the use of coal (-8.4 %), while oil and natural gas slightly increased. Consumption of energy from renewable sources including hydro grew 3.6%. The largest emission decrease was apparent in 1.A.1 Energy industries (-15.5 Mt CO₂ eq. or -9.5 %). Emissions decreased slightly in 1.A.4 Other sectors (-4.2%). In contrast other sectors saw fewer changes in emissions. Industry sector decreased very slightly (-0.4 Mt CO₂ eq. or -1.8%) and Waste sector as well (-2.7 Mt CO₂ eq. or -21%).

In the United Kingdom, emissions decreased by -15.2 Mt CO₂ eq. or -3.3 %. Consumption of coal decreased by 26.7%, while oil and natural gas decreased only slightly. Renewable energies including hydro increased by 10.7% while nuclear energy decreased by 13.6%. Total emissions decreased in all energy sectors: the strongest emission decline was in 1.A.1 Energy industries (-8.4 Mt CO₂ eq. or -8.9%). Increased biofuel consumption led to a significant emission reduction in 1.A.3 Transport (-3.3 Mt CO₂ eq. or -2.7 %). Only a slight reduction of emissions was observed in 1.A.2 Manufacturing industries and construction and 1.A.4 Other (-1.2 Mt CO₂ eq. or -2.4 % and -1.3%). All of the non-energy energy sectors showed emission reductions: strongest in the Waste sector (-0.4 Mt CO₂ eq. or -1.8 %), followed by emissions from Industrial processes and product use (-0.4 Mt CO₂ eq. or -1.4 %) and the Agriculture sector (-0.1 Mt CO₂ eq. or -0.2 %).

In Spain, emissions fell by 20.8 Mt CO₂ eq. or 6.2 %. Consumption of oil remained at the same level, while natural gas consumption increased by 14.0 %. The consumption of coal declined significantly by more than 54.6%. Consumption of renewable energy including hydro grew by 4.6% and nuclear energy increased by 4.4%. Emissions from 1.A.1 Energy industries fell the most (-17.5 Mt CO₂ eq. or 24.2 %). Industrial processes and product use decreased (-1.8 Mt CO₂ eq. or -6.4 %) as well as emissions from Agriculture (-0.6 Mt CO₂ eq. or -1.4%) and from Waste (-0.1 Mt CO₂ eq. or -0.7%).

In Italy, emissions decreased by 11.91 Mt CO₂ eq. or 2.8 %. Natural gas consumption increased by 2.3% while oil consumption decreased by 2.1% as well as coal by 19.3%. Renewables including hydro increased only slightly by 0.6%. The largest fall in emissions is apparent for 1.A.2 Manufacturing industries and construction by 5.24 Mt CO₂ eq. or 9.7 % followed by 1.A.1 Energy industries, where the decrease is 2.9 Mt CO₂ eq. or 3.1 % and 1.A.4 Other sectors, where the emissions fell by 1.39 Mt CO₂ eq. or 1.7 %. The emissions from Industrial processes and product use decreased by 0.18 Mt CO₂ eq. or 0.52% as well as in Waste (-1.4 Mt CO₂ eq. or 7.8 %). The emissions released from Agriculture increased very slightly (0.09 Mt CO₂ eq. or 0.29%).

The largest relative decrease was seen in Estonia. Emissions in Estonia decreased by 24.8%, significantly more than in any other Member State. On the sectoral basis the most apparent relative change is noted

⁸ ETC 2020, energy efficiency proxy 2019

⁹ ETC 2020, RES proxy 2019

for the Energy sector (-28.4%) where a decrease of -37.7% is reported in 1.A.1 Energy industries and a decrease of -18.8% in 1.A.2 Manufacturing industries and construction.

The change in 1.A.1 Energy industries is caused by the decline in the public electricity and heat production, due to the EU ETS CO₂ price increase and low electricity prices in 2019. The CO₂ price increase affected the electricity production of oil shale combustion plants, which had to be put on hold in Estonia.

Member states with increasing 2018 to 2019 emissions

Also in this section, consumption of coal, oil, gas and nuclear energy are primary energy consumption values from the ETC energy efficiency proxy 2019.¹⁰ Renewable energy including hydro is from the ETC RES proxy 2019.¹¹

Only five member states experienced emission increases – the most apparent is for Czechia, i.e. by 2.2 Mt CO₂ eq. or 1.7 % which is the largest absolute emission increase within the EU. Consumption of coal decreased by 6.4% while oil increased slightly by 0.7% and natural gas increased by 4.3%. Renewable energy including hydro increased by 4.1% while nuclear energy grew slightly by 0.7%. One reason for the increase of fossil fuel consumption and emissions is the increase in 1.A.3 Transport (2.3 Mt CO₂ eq. or 12.05 %). Emissions from 1.A.2 Manufacturing industries and Construction increased by 0.26 Mt CO₂ eq. or 2.62% and emissions from 1.A.4 Other sectors were higher by 0.74 Mt CO₂ eq. or 5.65%. Emissions from Agriculture decreased slightly (-0.29 Mt CO₂ eq. or 3.31 %) as well as emissions from Waste (-0.37 Mt or -6.55 %).

Croatia has the second largest emission increase within the member states – by 0.6 Mt CO₂ eq. or 2.4%. The change in fossil fuel consumption shows an emission increase in 1.A.3 Transport by 0.34 Mt CO₂ eq. or 5.36% followed by 1.A.1 Energy industries (0.25 Mt CO₂ eq. or 6.4 %). On the other hand, emissions from 1.A.2 Manufacturing industries and construction decreased by 0.29 Mt CO₂ eq. or 12 %. The Industrial processes and product use indicate slight increase in the emissions by 0.04 Mt CO₂ eq. or 1.7 % as well as emissions from the Agriculture sector (0.06 Mt CO₂ eq. or 2.3 %), and the Waste sector (0.1 Mt CO₂ eq. or 5.2 %). Consumption of coal increased by 15.9%, oil decreased by 3.4% while consumption of natural gas stayed stagnant. Renewable energies including hydro increased by 4.3%

Emissions reported by Luxembourg indicated also a minor increase in the emissions, i.e. 0.18 Mt CO₂ eq. or 1.7 %. The emission increase is apparent for 1.A.3 Transport by 0.15 Mt CO₂ eq. or 2.6 % followed by the 1.A.1 Energy industries and 1.A.2 Manufacturing industries and construction with increases of 0.01 Mt CO₂ eq., or 5.38% and 1.04% respectively. All the other sectors remained at almost same level in absolute values. Consumption of oil increased by 1.6% while natural gas and coal stayed the same. Renewable energies including hydro increased by 11.4%.

In Belgium, absolute emissions increased by 0.47 Mt CO₂ eq. or 0.4 % in 2019. Fossil liquid fuels decreased by 2.7 % and coal by 2.1%, however gas consumption rose by 3.0 %. Nuclear energy increased by 52.2 % and renewables by 8.1%. The resulting emission increases occurred in 1.A.1 Energy industries (0.66 Mt CO₂ eq. or 3.32%), in 1.A.2 Manufacturing industries (0.48 Mt CO₂ eq. or 3.45%) and in 1.A.3 Transport (0.21 Mt CO₂ eq. or 0.8%). In the Industrial processes and product use the emissions decreased by 0.77 Mt CO₂ eq. or 3.58% mainly due to the decrease in 2.B Chemical industry (-0.67 Mt CO₂ eq. or -6.96%). All the other sector's emissions remained at the similar level as in 2018.

Very slight increase in emissions is expected also for Austria, in total by 1.8% or +1.4 Mt CO₂ eq. The most apparent increase is noted in the IPPU (7.2% or 1.1 Mt CO₂ eq.). The highest increase is expected in 2.C Metal industry (+12% or 1.1 Mt CO₂ eq.) and in relative numbers in 2.B Chemical industry (+26%), however in absolute this increase is not as large (only +0.2 Mt CO₂ eq.). The Energy sector indicates an increase of 0.8%, however both Agriculture and Waste registered decreases. Consumption of coal

¹⁰ ETC 2020, ENEF proxy 2019

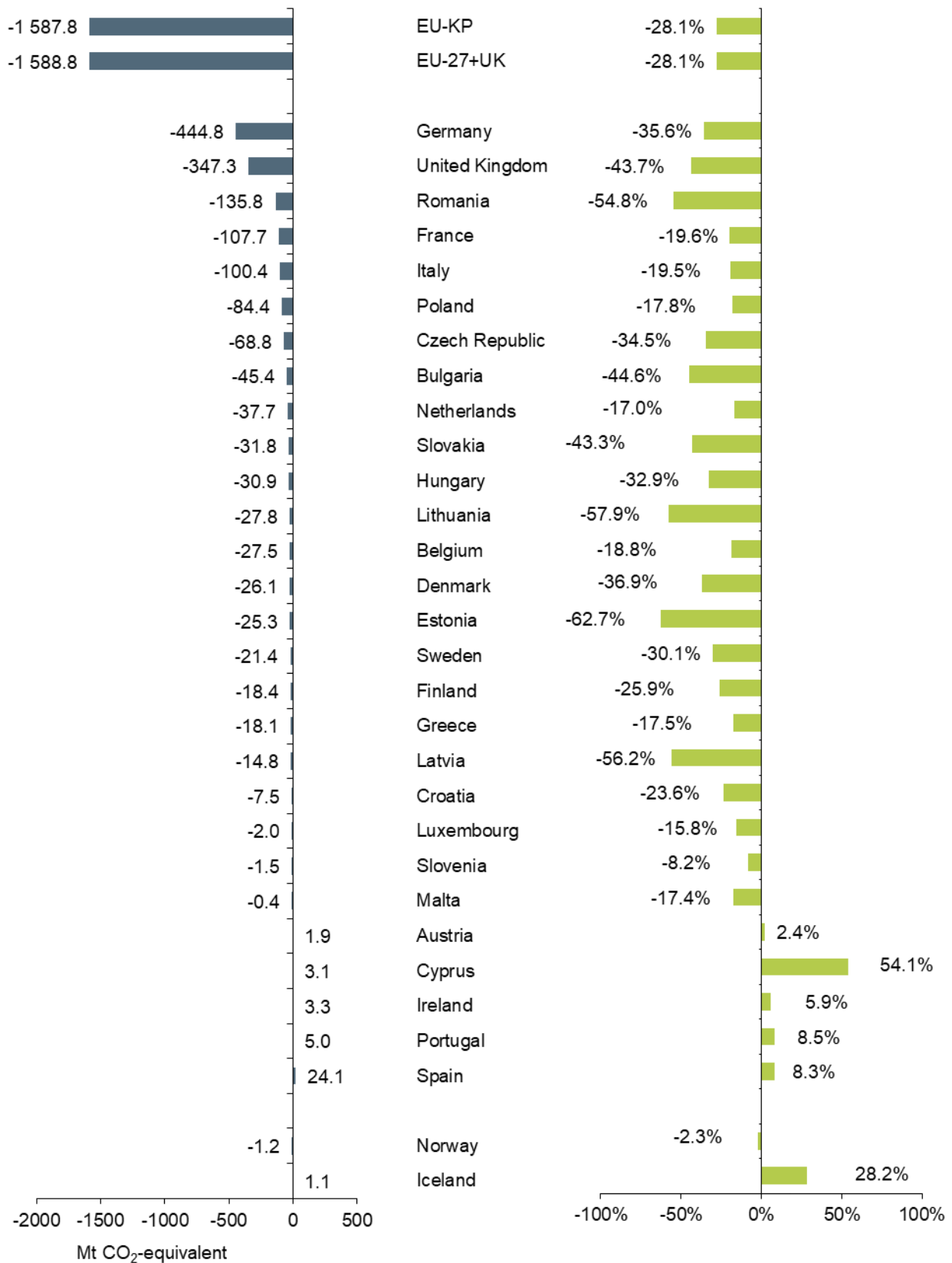
¹¹ ETC 2020, RES proxy 2019

increased by 4.1%, oil by 2.0% and natural gas by 2.8% while renewable energies including hydro rose by 2.2%.

2.1.4 Changes in member states GHG emissions 1990 to 2019

Total EU27+UK GHG emissions in 2019 are estimated to be -28.1 % or -1588.8 Mt CO₂ eq. below 1990 levels as shown in Figure 2-5. Total emissions including emissions from international aviation are estimated to be 26.0% below 1990 levels, showing a reduction of 1485.89 Mt CO₂ eq. Emissions for most EU27 + UK Member States are lower than in 1990 while emissions in Austria, Cyprus, Ireland, Portugal and Spain are higher than in 1990. The largest absolute decrease was in Germany, followed by the United Kingdom, Romania and France which all reduced their GHG emissions by more than 100 Mt CO₂ eq. since 1990. The largest absolute increase was experienced by Spain with 24.1 Mt CO₂ eq. The absolute emission increases in the other Member States are lower by an order of magnitude.

Figure 2-5 Member States' emissions change 1990-2019



The largest relative emission decreases were in Estonia, Lithuania, Latvia and Romania which all reduced their emissions by more than 50 % compared to 1990. The relative emission decreases of further nine Member States are stronger than the EU27+UK average. The largest relative emission increase was in Portugal and Spain (+8.5 % and +8.3 %). As it is noted below, data for Cyprus were gap-filled; the increase is caused by the increase of emissions in mineral industry for about 44 kt CO₂.

Of the four non-EU member countries of the EEA considered in this report only Switzerland had in 2019 lower GHG emissions compared to 1990 level, while Iceland shows an increase as well as Norway. Turkey is not presented in Figure 2-5 since only LULUCF data were reported by the country.

2.1.5 Detailed results for the EU27+UK and EU-KP

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 CO₂ eq. and percentage changes. It should be noted, that in their proxy submissions, a number of Member States used the 2018 value for emissions from international aviation as an approximated value for 2019. 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 2019 proxy, this method was applied to 9 countries.

Table 2-1 Emissions including international aviation (kt CO₂ eq.)

	1990	2018	2019	2019-2018	2019/2018	2019-1990	2019/1990
European Union (EU27+UK)							
Total excl. LULUCF incl. indirect CO ₂	5 652 165	4 225 970	4 063 371	-162 599	-3.85%	-1 588 794	-28.11%
International aviation	69 206	165 871	172 113	6 242	3.76%	102 907	148.70%
Total CO ₂ eq. including international aviation	5 721 371	4 391 841	4 235 483	-156 358	-3.56%	-1 485 887	-25.97%
European Union plus Iceland (EU - KP)							
Total excl. LULUCF incl. indirect CO ₂	5 655 897	4 230 827	4 068 155	-162 672	-3.84%	-1 587 742	-28.07%
International aviation	69 427	167 175	173 077	5 902	3.53%	103 650	142.29%
Total CO ₂ eq. including international aviation	5 725 325	4 398 002	4 241 232	-156 769	-3.56%	-1 484 092	-25.92%
European Union (EU27)							
Total excl. LULUCF incl. indirect CO ₂	4 857 916	3 763 868	3 616 426	-147 442	-3.92%	-1 241 490	-25.56%
International aviation	53 715	129 227	133 046	3 818	2.95%	79 330	147.69%
Total CO ₂ eq. including international aviation	4 911 631	3 893 095	3 749 472	-143 623	-3.69%	-1 162 160	-23.66%

Table 2-2 and Table 2-3 show the detailed results for the EU27+UK and the EU-KP 2019. Summary tables for 2019 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 2019 for EU27+UK (total emissions without LULUCF including indirect CO₂)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country EU27+UK
Geographical scope Sum of the 27 MS + UK

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	3 284 717	430 908	236 523	97 951	3 484	6 625	1 512	69	4 061 788		
1. Energy	3 027 588	76 958	28 727						3 133 273		
A. Fuel combustion (sectoral approach)	3 001 947	24 440	28 613						3 055 000		
1. Energy industries	976 429	4 224	6 715						987 368		
2. Manufacturing industries and construction	477 284	2 257	4 876						484 417		
3. Transport	940 322	1 344	9 096						950 762		
4. Other sectors	601 842	16 607	7 858						626 307		
5. Other	6 070	9	68						6 147		
B. Fugitive emissions from fuels	25 641	52 518	113						78 273		
1. Solid fuels	4 281	25 535	0						29 732		
2. Oil and natural gas	21 360	26 984	113						48 442		
C. CO ₂ transport and storage	-	-	-						-		
2. Industrial processes and product use	244 003	1 402	10 259	97 951	3 484	6 625	1 512	69	365 304		
A. Mineral industry	111 239								111 239		
B. Chemical industry	52 376	1 169	6 306	2 155	1 693	1	52	-	63 752		
C. Metal industry	70 134	140	23	32	440	300	-	-	71 069		
D. Non-energy products from fuels and solvent use	9 569	2	5						9 576		
E. Electronic Industry				64	533	147	21	69	833		
F. Product uses as ODS substitutes				95 683	91	-	1 307	-	97 081		
G. Other product manufacture and use	624	77	3 840	16	726	6 170	-	-	11 452		
H. Other	61	13	85	2	1	7	131	-	301		
3. Agriculture	10 228	233 681	187 053						430 962		
A. Enteric fermentation		189 058							189 058		
B. Manure management		40 244	22 737						62 981		
C. Rice cultivation		2 540							2 540		
D. Agricultural soils		-	163 869						163 869		
E. Prescribed burning of savannas		-	-						-		
F. Field burning of agricultural residues		497	182						679		
G. Liming	5 827								5 827		
H. Urea application	4 114								4 114		
I. Other carbon-containing fertilizers	287								287		
J. Other	-	1 343	265						1 607		
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	NE						NE		
H. Other	NE	NE	NE						NE		
5. Waste	2 897	118 867	10 485						132 249		
A. Solid waste disposal	-	93 311							93 311		
B. Biological treatment of solid waste		5 464	2 893						8 356		
C. Incineration and open burning of waste	2 879	412	539						3 830		
D. Waste water treatment and discharge		19 674	6 986						26 660		
E. Other	18	7	67						92		
6. Other (as specified in summary 1.A)	-	-	-						-		
Memo items:⁽²⁾											
International bunkers	173 709	143	1 649						234 363		
Aviation	166 200	25	1 465						172 113		
Navigation	NE	NE	NE						NE		
Multilateral operations	2	0	0						2		
CO ₂ emissions from biomass	359 607								434 738		
CO ₂ captured	125	-							125		
Long-term storage of C in waste disposal sites	157 548	-							157 548		
Indirect N ₂ O			4 255								
Indirect CO ₂ ⁽³⁾	1 582										
Total CO₂ equivalent emissions without land use, land-use change and forestry									4 061 788		
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									4 063 371	1 503 164	2 560 207
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

Table 2-3 Summary table of approximated GHG emissions for 2019 for EU-KP (total emissions without LULUCF including indirect CO₂)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

This sheet is a sum of the 28 MS_2016 plus IS_2016 (submitted or gap filled) proxy sheets

Year 2019
Submission 2020
Country EU-KP

Geographical scope Sum of the 27 MS+ UK plus IS

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	3 293 747	435 086	236 812	98 158	3 573	6 627	1 512	69	3 874 102		
1. Energy	3 029 465	76 965	28 751						3 135 180		
A. Fuel combustion (sectoral approach)	3 003 660	24 443	28 638						3 056 740		
1. Energy industries	976 434	4 224	6 715						987 373		
2. Manufacturing industries and construction	477 385	2 257	4 885						484 527		
3. Transport	941 344	1 345	9 104						951 792		
4. Other sectors	602 426	16 608	7 866						626 900		
5. Other	6 072	9	68						6 148		
B. Fugitive emissions from fuels	25 804	52 522	113						78 440		
1. Solid fuels	4 281	25 535	0						29 732		
2. Oil and natural gas	21 523	26 987	113						48 609		
C. CO ₂ transport and storage	-	-	-						-		
2. Industrial processes and product use	245 725	1 405	10 262	98 158	3 573	6 627	1 512	69	367 329		
A. Mineral industry	111 249								111 249		
B. Chemical industry	52 376	1 169	6 306	2 155	1 693	1	52	-	63 752		
C. Metal industry	71 840	143	23	32	528	300	-	-	72 867		
D. Non-energy products from fuels and solvent use	9 574	2	5						9 582		
E. Electronic Industry				64	533	147	21	69	833		
F. Product uses as ODS substitutes				95 890	91	-	1 307	-	97 288		
G. Other product manufacture and use	624	77	3 842	16	726	6 172	-	-	11 457		
H. Other	61	13	85	2	1	7	131	-	301		
3. Agriculture	10 236	234 033	187 304						431 573		
A. Enteric fermentation		189 354							189 354		
B. Manure management		40 300	22 756						63 056		
C. Rice cultivation		2 540							2 540		
D. Agricultural soils		-	164 101						164 101		
E. Prescribed burning of savannas		-	-						-		
F. Field burning of agricultural residues		497	182						679		
G. Liming	5 831								5 831		
H. Urea application	4 116								4 116		
I. Other carbon-containing fertilizers	288								288		
J. Other	-	1 343	265						1 607		
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	NE						NE		
H. Other	NE	NE	NE						NE		
5. Waste	2 910	119 087	10 493						132 491		
A. Solid waste disposal	-	93 482							93 482		
B. Biological treatment of solid waste		5 466	2 895						8 361		
C. Incineration and open burning of waste	2 892	412	540						3 844		
D. Waste water treatment and discharge		19 720	6 992						26 712		
E. Other	18	7	67						92		
6. Other (as specified in summary 1.A)											
Memo items:⁽²⁾											
International bunkers	NE	NE	NE						NE		
Aviation	167 156	26	1 473						173 077		
Navigation	NE	NE	NE						NE		
Multilateral operations	NE								NE		
CO₂ emissions from biomass	NE								NE		
CO₂ captured	NE	NE							NE		
Long-term storage of C in waste disposal sites	NE	NE							NE		
Indirect N₂O			NE								
Indirect CO₂⁽³⁾	1 582										
Total CO₂ equivalent emissions without land use, land-use change and forestry									4 066 573		
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									4 068 155	1 504 971	2 563 184
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

2.2 Sectoral results

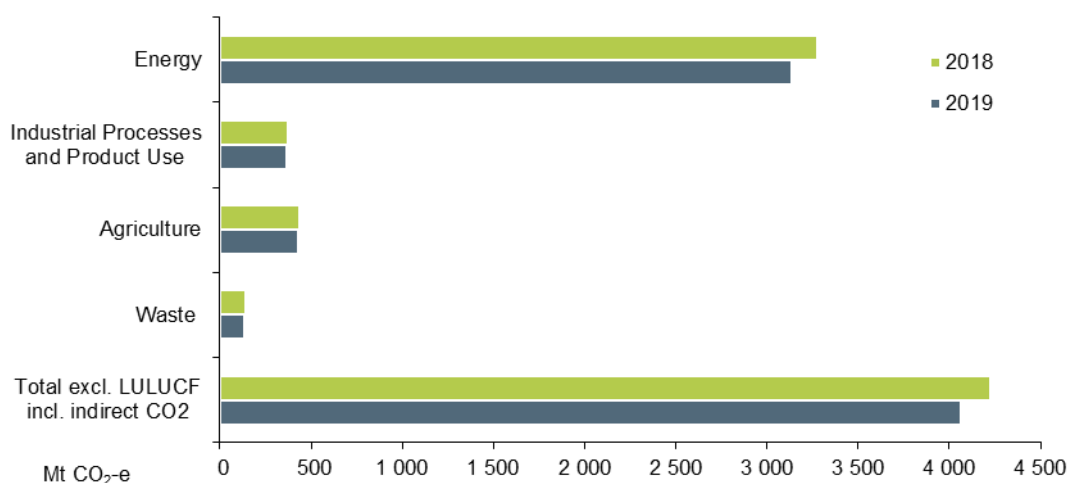
Table 2-4 and Figure 2-6 show the changes between 2018 and 2019 at the sectoral level for the EU27+UK.

Table 2-4 Emissions by sector, change 2018-2019

Change 2018 / 2019, EU27+UK	Mt CO ₂ eq.	%
Energy	-145.9	-4.4%
Industrial Processes and Product Use	-6.6	-1.8%
Agriculture	-4.3	-1.0%
Waste	-5.7	-4.2%
Total excl. LULUCF incl. indirect CO ₂	-162.6	-3.8%

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

Figure 2-6 Emissions by sector, EU27+UK, 2018-2019



Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

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 -145.9 Mt CO₂ eq. (-4.4%) 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 6.6 Mt CO₂ eq. (-1.8%), the agricultural sector experienced a decrease of 4.3 Mt CO₂ eq. (-1.0%) and the waste sector indicated a decrease of 5.7 Mt CO₂ eq. (-4.2%).

2.2.1 Energy

Emissions from the energy sector contributed about 78% of total EU emissions in 2018 and is expected to keep the share of 77% of total EU emissions also for 2019. Emissions from fuel combustion saw a decrease of 141.5 Mt CO₂ eq. or 4.4% compared to 2018. Table 2-5 shows that the largest change in fuel combustion emissions occurred in 1.A.1 Energy Industries with a decrease of 122.8 Mt CO₂ eq. (-11.1%). In the sector 1.A.2 Manufacturing industries and construction emissions also decreased (-16.3 Mt CO₂ eq. resp. -3.2%) as well as emissions in 1.A.4 Other sectors (-3.2 Mt CO₂ eq. or -0.5%). An increase in

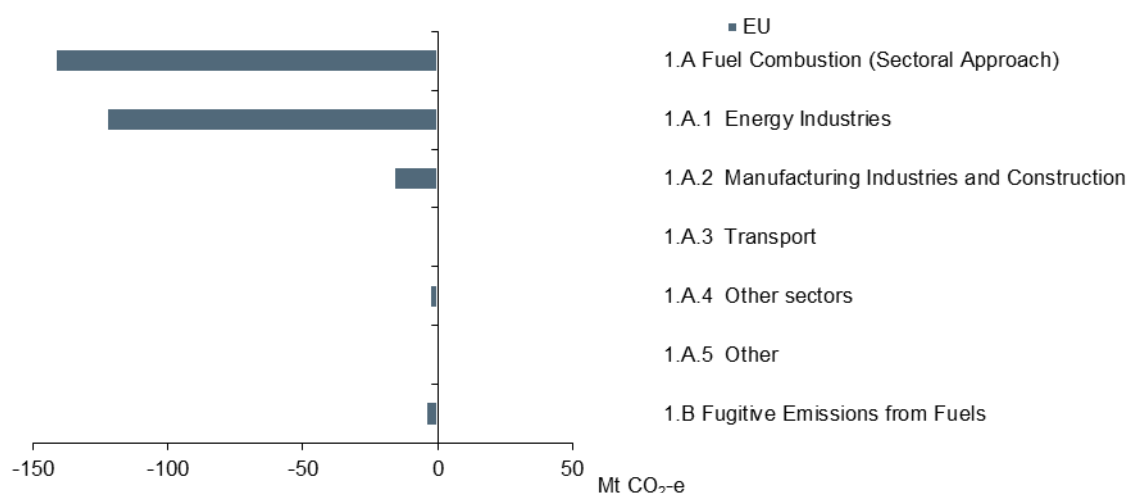
emissions is apparent in 1.A.3 Transport (+0.7 Mt CO₂ eq. or +0.1 %) and decrease is in 1.B Fugitive emissions from fuels (-4.4 Mt CO₂ eq. or -5.3 %).

Table 2-5 Energy sector emissions, change 2018-2019

Change 2018 / 2019, EU27+UK	Mt CO ₂ eq	%
1.A Fuel Combustion (Sectoral Approach)	-141.6	-4.4%
1.A.1 Energy Industries	-122.8	-11.1%
1.A.2 Manufacturing Industries and Construction	-16.3	-3.2%
1.A.3 Transport	0.7	0.1%
1.A.4 Other sectors	-3.2	-0.5%
1.A.5 Other	-0.1	-0.9%
1.B. Fugitive Emissions from Fuels	-4.4	-5.3%

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

Figure 2-7 Energy sector emissions, EU27+UK change 2018-2019



Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

The largest increase in emissions for 1.A Fuel Combustion on Member States level was noted for Czechia (+3.3 Mt CO₂ eq.). The largest emission decrease was in Germany (-49 Mt CO₂ eq.) followed by Spain (-18.5 Mt CO₂ eq.) and Poland (-17.1 Mt CO₂ eq.). Emissions from Fuel Combustion increased in 7 Member States and decreased in 21 countries.

Going to more detail in the sub category 1.A.1 Energy Industries, the largest reduction was in Germany (-49.4 Mt CO₂ eq.), followed by Spain (-17.5 Mt CO₂ eq.) and Poland (-15.5 Mt CO₂ eq.). The increases were only minor, with the largest change noted for Belgium (+0.7 Mt CO₂ eq.). Emissions changes in the sector 1.A.2 Manufacturing Industries and Construction were significantly smaller. The largest decrease was in Italy (-5.2 Mt CO₂ eq.) and the largest increase in Belgium (0.5 Mt CO₂ eq.). Emissions from 1.A.3 Transport increased in 15 Member States. The largest increases were in Czechia (+2.3 Mt CO₂ eq.) and Poland (+1.6 Mt CO₂ eq.), while largest decrease is noted for the United Kingdom (-3.3 Mt CO₂ eq.) in absolute values, while in relative values the most significant decrease was noted for Slovenia (-4.8%). In 1.A.4 Other Sectors (which include residential and commercial sectors) emissions increased in 11 Member States. The largest increase occurred in Germany (+5.1 Mt CO₂ eq.). The largest decrease was in Poland

(-2.4 Mt CO₂ eq.). Emission changes in the sector 1.A.5 Other in all Member States are less than ±0.2 Mt CO₂ eq. For the sub category 1.B Fugitive Emissions from fuels, the largest decrease was in Poland (-1.9 Mt CO₂ eq.) and Germany (-1.5 Mt CO₂ eq.) and the largest increase in Latvia (+0.03 Mt CO₂ eq.).

2.2.2 Industrial Processes and Product Use

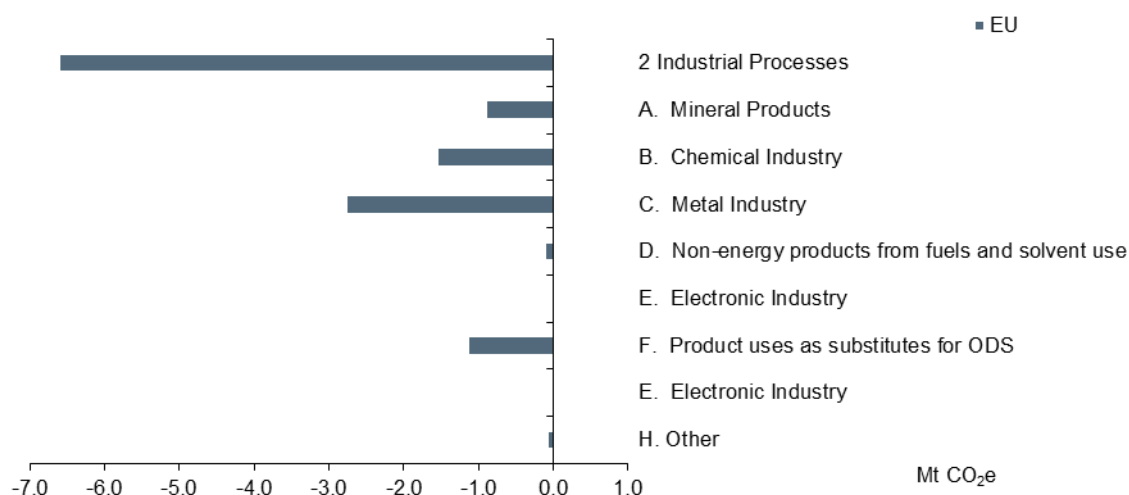
The Sector Industrial Processes and Product Use (IPPU) contributes to about 9 % of total EU emissions and are the third most important source after energy and agriculture. Emissions from Industrial Processes decreased by 6.6 Mt CO₂ eq. in the EU (-1.8%). Table 2.B-6 and Figure 2-8 show the sub-sector contribution to this trend in emissions. The largest emission decrease occurred in the subsector 2.C Metal industry followed by the 2.B Chemical industry.

Table 2.B-6 Industrial Processes and Product Use emissions, change 2018-2019

Change 2018 / 2019, EU27+UK	Mt CO ₂ eq.	%
2 Industrial Processes	-6.6	-1.8%
A. Mineral Products	-0.9	-0.8%
B. Chemical Industry	-1.5	-2.4%
C. Metal Industry	-2.8	-3.7%
D. Non-energy products from fuels and solvent use	-0.1	-1.3%
E. Electronic Industry	0.0	1.0%
F. Product uses as substitutes for ODS	-1.1	-1.1%
G. Other Product Manufacture and Use	-0.1	-0.5%
H. Other	-0.1	-19.7%

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

Figure 2-8 Industrial Processes and Product Use emissions, EU27+UK, change 2018-2019



Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019.

In 8 of the EU27+UK Member States emissions from IPPU increased. The largest increase of IPPU emissions was in Austria (+1.1 Mt CO₂ eq.) followed by Sweden (+0.7 Mt CO₂ eq.), while the largest decreases were in Spain (-1.8 Mt CO₂ eq.) followed by Germany (-1.6 Mt CO₂ eq.). In the sub category 2.A Mineral Products, emissions decreased by -0.8 Mt CO₂ eq. for Spain, while highest increase is apparent for Romania (+0.2 Mt CO₂ eq.). Emissions from 2.B Chemical Products decreased in the EU (-

1.5 Mt CO₂ eq. or -2.4 %). The largest increases were in Czechia (+0.3 Mt CO₂ eq.) while the largest decrease was in Greece (-0.75 Mt CO₂ eq.). Emissions from 2.C Metal Industry decreased by -2.8 Mt CO₂ eq. or -3.7 % with the largest increase in Austria (+1.1 Mt CO₂ eq.) while the largest decrease occurred in Germany (-1.3 Mt CO₂ eq.). The IPPU sub-sector 2.D Non-energy Products from Fuels and Solvent Use has had only slight decrease in the emissions (-0.1 Mt CO₂ eq. or -1.3 %). The largest emission changes were in Romania (-0.2 Mt CO₂ eq.). The subsector 2.E Electronic Industry showed only slight absolute emission changes for the EU (0.01 Mt CO₂ eq. or 1 %). Emissions changes for individual Member States were within ±0.02 Mt CO₂ eq. The IPPU sub-sector 2.F Product uses as substitutes for ODS saw emissions decrease by 1.1 Mt CO₂ eq. (-1.1 %). In 10 Member States emissions increased in this source category and in 14 Member States emissions decreased. By far the largest change of emissions was in Spain, where 2.F emissions fell by 0.5 Mt CO₂ eq. In contrast, emissions increased significantly in Portugal (+0.17 Mt CO₂ eq.). All other emission changes were less than ±0.5 Mt CO₂ eq. Emissions from 2.G Other Product Manufacture and Use decreased slightly for the EU (-0.1 Mt CO₂ eq. or -0.5 %). Emission changes of all other Member States are less than ±0.1 Mt CO₂ eq. The decrease of emissions from 2.H Other is almost irrelevant by absolute terms (-0.1 Mt CO₂ eq.) but significant in relative terms (-19.7 %).

2.2.3 Agriculture

Agriculture (excluding LULUCF) contributes to 11 % of European GHG emissions. Emissions from agriculture decreased by 4.3 Mt CO₂ eq. or 1.0 % since 2018. The largest greenhouse gas emitting activities within the sector are CH₄ from livestock and N₂O from soils. Enteric fermentation and soils contributed about 44 % and 38 % of the of the sector's emissions respectively. As shown in Table 2-7 and Figure 2-9 the decrease in agriculture sector emissions is largely due to decreased emissions from enteric fermentation, but liming, other carbon containing fertilizers and urea application contributed to this decrease as well.

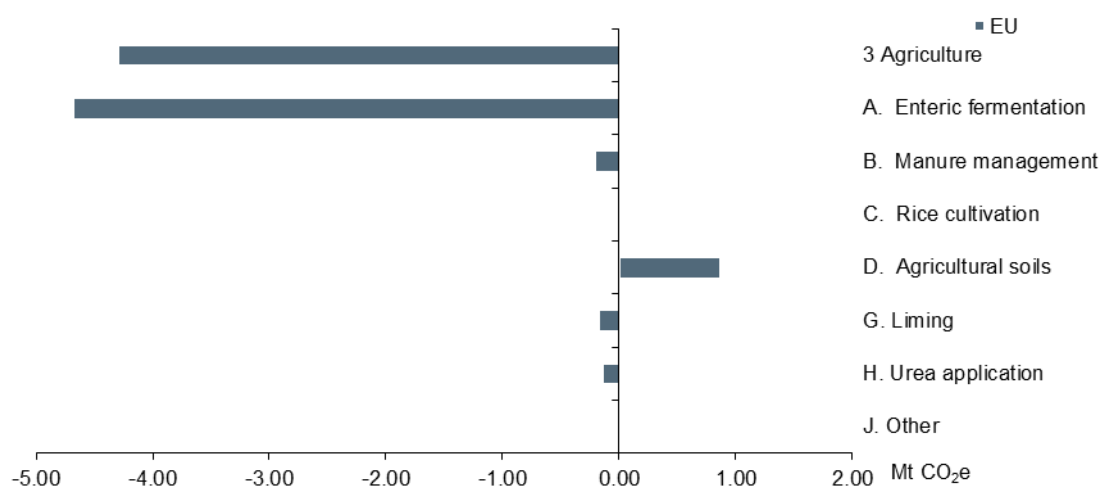
Table 2-7 and Figure 2-9 show the sub-sector 2018-2019 change, with CH₄ and N₂O emissions shown as CO₂ equivalents (Mt CO₂ eq.).

Table 2-7 Agriculture sector emissions, change 2018-2019

Change 2018 / 2019, EU27+UK	Mt CO ₂ eq.	%
3 Agriculture	-4.3	-1.0%
A. Enteric fermentation	-4.7	-2.4%
B. Manure management	-0.2	-0.3%
C. Rice cultivation	0.0	0.3%
D. Agricultural soils	0.9	0.5%
E. Prescribed burning of savannas	-	-
F. Field burning of agricultural residues	0.0	7.0%
G. Liming	-0.2	-2.9%
H. Urea application	-0.1	-3.2%
I. Other carbon-containing fertilizers	0.0	-3.9%
J. Other	0.0	0.0%

Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019

Figure 2-9 Agriculture sector emissions, EU27+UK, change 2018-2019



Source: The EEA's ETC/CME, based on the 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018 and proxy estimates for 2019

Emissions from Enteric Fermentation decreased by 4.7 Mt CO₂ eq. or 2.4 %. The largest absolute and relative decreases were in Romania (-3.5 Mt CO₂ eq.). Emissions of CH₄ and N₂O from manure management contribute to about 15 % of the agriculture sector and have decreased by 0.2 Mt CO₂ eq. or -0.3%. The largest increase was in Poland (0.4 Mt CO₂ eq.) and the largest decrease was in Romania (-0.3 Mt CO₂ eq.). Agricultural soils contribute to about 38 % of the emissions from agriculture and show a minor increase on 2018 emission level (+0.9 Mt CO₂ eq., +0.5 %). The largest increases were seen in Romania (2.6 Mt CO₂ eq. or 40.8 %). The largest decrease was in Germany (-0.8 Mt CO₂ eq. or -3.0 %).

2.2.4 Waste

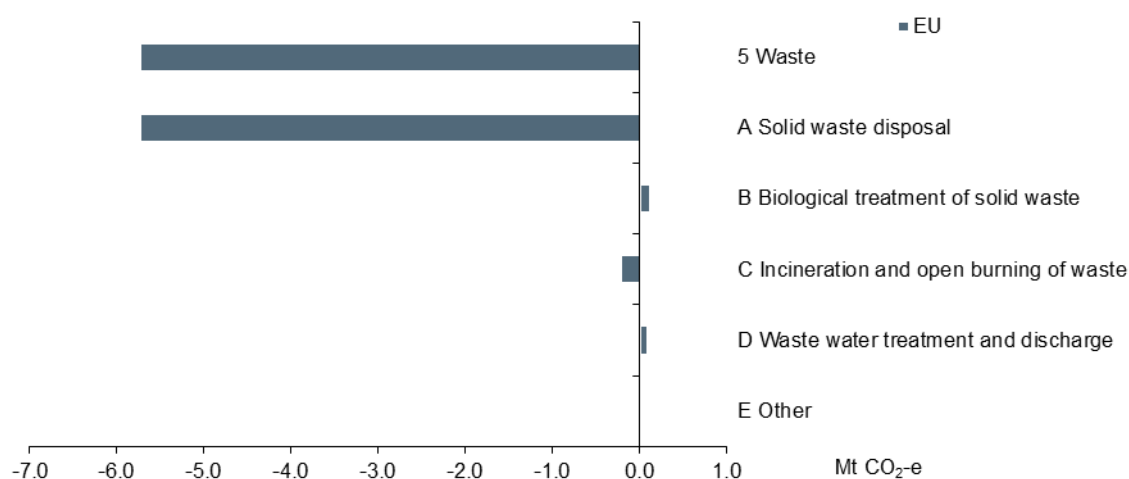
The Waste sector contributes to about 3 % of European emissions. Waste related emissions continue to decrease reflecting the large relative proportion of emissions from solid waste disposal (71 % of Waste emissions are from Solid waste disposal) and the ongoing effect of restrictions on landfilling of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

Emissions from the Waste sector decreased by -5.7 Mt CO₂ eq. compared to 2018. Table 2-8 and Figure 2-10 show the sub-sector contributions to this trend in emissions.

Table 2-8 Waste sector emissions, change 2018-2019

Change 2018/2019, EU27+UK	Mt CO ₂ eq.	%
5 Waste	-5.7	-4.2%
A Solid Waste Disposal	-5.7	-5.8%
B Biological Treatment of Solid Waste	0.1	1.4%
C Incineration and Open burning of Waste	-0.2	-5.1%
D Waste Water Treatment and Discharge	0.1	0.3%
E Other	0.0	0.0%

Figure 2-10 Waste sector emissions, EU27+UK, change 2018-2019



The largest decrease of waste emissions was noted for Poland (-2.7 Mt CO₂ eq.) followed by in Italy (-1.4 Mt CO₂ eq.). The trends of 5.A Solid Waste emissions generally dominate the waste sector. 19 Member States decreased emissions from solid waste (largest decrease in Poland with -2.5 Mt CO₂ eq.) while four Member States had an increase in emissions (the largest one in Romania with +119 kt CO₂ eq.) and the rest has negligible difference. 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, CO₂ emissions from domestic aviation and NF₃ emissions from total emissions including indirect CO₂ emissions. LULUCF is excluded from ESD emissions.

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

E_{ESD}	Emission under Effort Sharing Decision
E_{total}	Total emissions excl. LULUCF incl. indirect CO ₂
E_{ETS}	Emissions included in the ETS
$E_{1A3a,CO2}$	CO ₂ emissions from domestic aviation
E_{NF3}	NF ₃ emissions

Table 2-9 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, 25 August 2020) for stationary installations, ESD emissions are calculated as described in the formula above. Relative changes in emissions between the years 2018 and 2019 can be seen on the right.

Table 2-9 Total, ETS and ESD emissions 2018 and 2019, kt CO₂ eq.

MS	2018 GHG emissions			2019 GHG emissions			Change 2019 versus 2018			
	Total	ETS	ESD	Total	ETS	ESD	Total	ETS	Non-ETS	ESD
AT	78 950	28 404	50 484	80 361	29 564	50 735	1.8%	4.1%	0.5%	0.5%
BE	118 456	44 183	74 253	118 927	44 627	74 280	0.4%	1.0%	0.0%	0.0%
BG	57 816	31 028	26 735	56 367	29 194	27 120	-2.5%	-5.9%	1.4%	1.4%
CY	8 812	4 586	4 225	8 767	4 461	4 305	-0.5%	-2.7%	1.9%	1.9%
CZ	128 139	66 913	61 213	130 297	62 519	67 764	1.7%	-6.6%	10.7%	10.7%
DE	858 369	422 261	434 103	804 619	362 955	439 660	-6.3%	-14.0%	1.3%	1.3%
DK	48 224	14 954	33 136	44 665	12 041	32 491	-7.4%	-19.5%	-1.9%	-1.9%
EE	19 974	13 853	6 117	15 021	8 486	6 530	-24.8%	-38.7%	6.8%	6.8%
ES	334 255	127 374	203 851	313 485	109 523	200 932	-6.2%	-14.0%	-1.4%	-1.4%
FI	56 411	26 262	29 934	52 782	23 247	29 320	-6.4%	-11.5%	-2.0%	-2.1%
FR	444 823	97 484	342 106	440 654	94 292	341 129	-0.9%	-3.3%	-0.3%	-0.3%
GR	92 222	47 106	44 695	85 185	40 476	44 288	-7.6%	-14.1%	-0.9%	-0.9%
HR	23 793	7 445	16 316	24 365	7 515	16 818	2.4%	0.9%	3.1%	3.1%
HU	63 220	20 054	43 161	63 011	19 531	43 477	-0.3%	-2.6%	0.7%	0.7%
IE	60 935	15 515	45 401	58 745	14 171	44 555	-3.6%	-8.7%	-1.9%	-1.9%
IT	427 529	146 482	278 707	415 622	140 942	272 340	-2.8%	-3.8%	-2.3%	-2.3%
LT	20 267	5 953	14 312	20 219	5 856	14 361	-0.2%	-1.6%	0.3%	0.3%
LU	10 547	1 469	9 078	10 724	1 496	9 227	1.7%	1.9%	1.6%	1.6%
LV	11 727	2 613	9 111	11 537	2 493	9 041	-1.6%	-4.6%	-0.8%	-0.8%
MT	2 186	698	1 487	2 123	739	1 383	-2.9%	5.9%	-7.0%	-7.0%
NL	188 197	87 414	100 751	183 938	83 744	100 162	-2.3%	-4.2%	-0.6%	-0.6%
PL	412 856	199 975	212 748	390 671	183 685	206 852	-5.4%	-8.1%	-2.8%	-2.8%
PT	67 417	26 289	40 630	63 661	21 603	41 559	-5.6%	-17.8%	2.3%	2.3%
RO	116 115	39 624	76 325	112 168	36 546	75 456	-3.4%	-7.8%	-1.1%	-1.1%
SE	51 779	19 856	31 400	49 756	18 731	30 502	-3.9%	-5.7%	-2.8%	-2.9%
SI	17 502	6 492	11 008	17 074	6 254	10 819	-2.4%	-3.7%	-1.7%	-1.7%
SK	43 348	22 193	21 152	41 681	19 904	21 775	-3.8%	-10.3%	2.9%	2.9%
UK	462 102	128 861	331 701	446 945	118 568	326 836	-3.3%	-8.0%	-1.5%	-1.5%
EU27+UK	4 225 970	1 655 341	2 554 139	4 063 371	1 503 164	2 543 716	-3.8%	-9.2%	-0.4%	-0.4%
IS	4 857	1 855	2 978	4 785	1 807	2 953	-1.5%	-2.6%	-0.8%	-0.8%
EU-KP	4 230 827	1 657 196	2 556 927	4 068 155	1 504 971	2 546 479	-3.8%	-9.2%	-0.4%	-0.4%

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 2020 Member States' GHG inventories submitted to UNFCCC for the years 1990-2018, proxy estimates for 2019 totals. ETS data is from EUTL (verified emissions for 2018 and 2019, not from the Member States proxies).

In total, emissions changed by -3.8 % within the EU between 2018 and 2019. Emissions decreased in the ETS sector and in the ESD sector but the decrease in the ESD sector (-0.4 %) is less significant than in the ETS sector (-9.2 %). Figure 2-11 illustrates all emission trend changes.

In absolute terms, the total emission decrease in the EU was -162.6 Mt CO₂ eq. Of this decrease -10.4 Mt CO₂ eq. occurred in the ESD sector and -152.2 Mt CO₂ 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 five Member States (Austria, Belgium, Croatia, Luxembourg and Malta). By absolute amounts the largest increase occurred in Austria (+1.2 Mt CO₂ eq.) followed by Belgium (0.4 Mt CO₂ eq.). The largest relative increase of ETS emissions was in Malta (+5.9 %) followed by Austria (+4.1 %).

In 23 EU Member States ETS emissions decreased. The largest absolute decrease was experienced in Germany (-59.3 Mt CO₂ eq.) followed by Poland (-16.3 Mt CO₂ eq.) and Spain (-17.9 Mt CO₂ eq.). Estonia saw the highest relative ETS emission decrease (-38.7 %).

Also ESD emissions increased in 13 Member States (Belgium, Bulgaria, Cyprus, Czechia, Germany, Estonia, Croatia, Hungary, Lithuania, Luxembourg, Portugal and Slovakia). The largest absolute increase can be observed in Czechia (+6.5 Mt CO₂ eq.) and Germany (+5.5 Mt CO₂ eq.). The largest relative increase was as well in Czechia (+10.7 %), the second largest was in Estonia (+6.8 %).

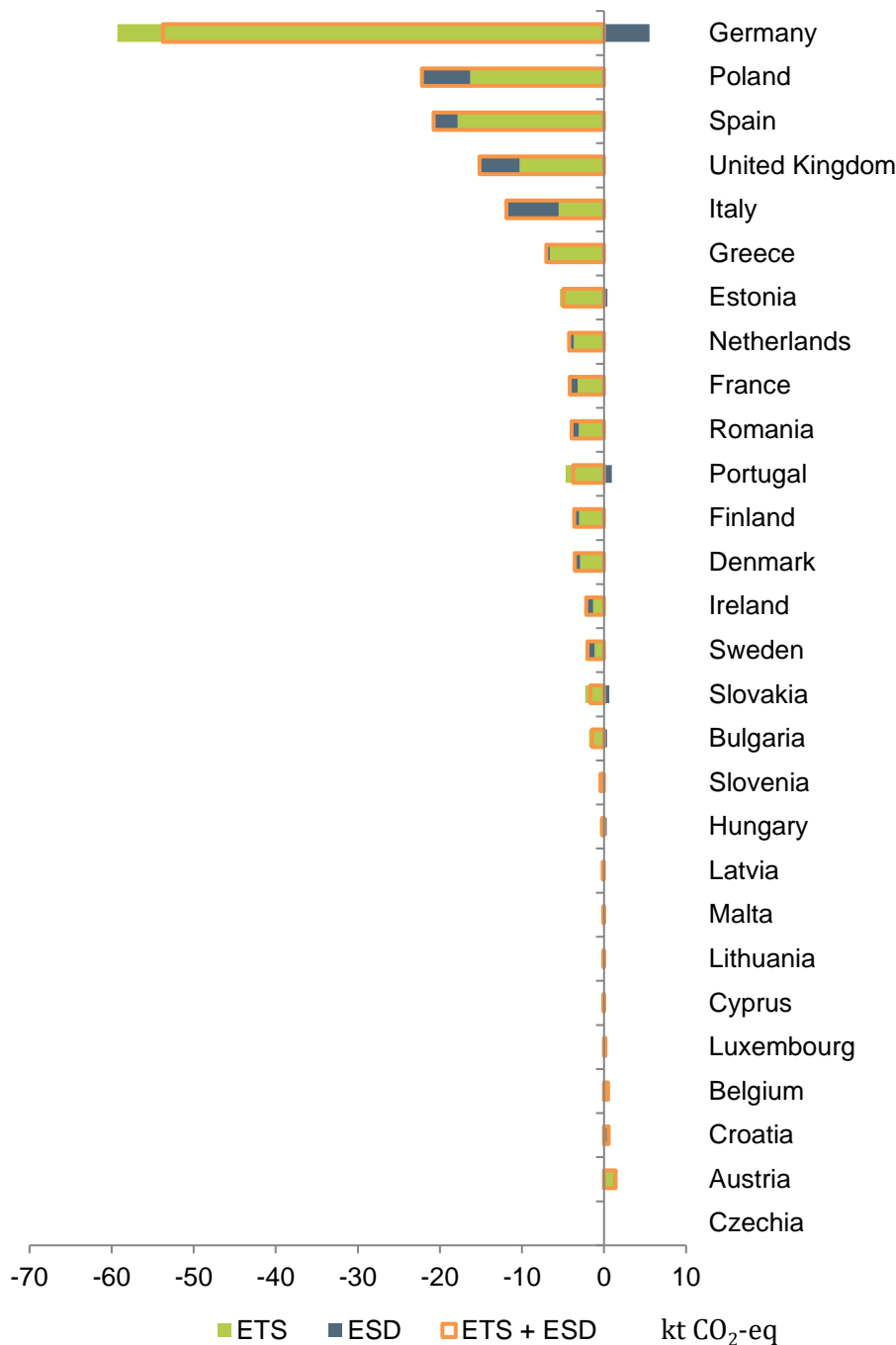
15 Member States saw decreases in ESD emissions. The largest absolute ESD emission declines were in Italy (-6.4 Mt CO₂ eq.) followed by Poland (-5.9 Mt CO₂ eq.). The largest relative decrease of ESD emissions was in Malta (-7%).

Increases of both ETS and ESD emissions can hence be seen for Austria, Belgium, Croatia, and Luxembourg. On the other hand, there are fourteen Member States which had decreases in both ETS and ESD emissions: Denmark, France, Finland, Greece, Ireland, Italy, Latvia, Netherlands, Poland, Romania, Sweden, Slovenia and the United Kingdom.

In Bulgaria, Cyprus, Czechia, Germany, Estonia, Hungary, Lithuania, Portugal and Slovakia emissions in the ETS sector decreased while emissions in the ESD sector increased. A contrasting development can be observed only for 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. Especially the slight decrease of the ESD emissions is consistent with the strong emission increase in the transport sector.

Figure 2-11 ETS and ESD emissions, change 2018-2019



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 2018 overestimated the GHG emissions for the EU by 7.1 Mt CO₂ eq. or 0.2 %.

The effect of Member States' recalculations of GHG estimates and methodological improvements dominate the differences of the 2018 proxy emission estimates compared to 2018 emissions officially reported in 2020. After taking these recalculations into account difference between the proxy GHG inventory for 2018 and final GHG inventory submission was only 0.2 % for total emissions (including indirect CO₂, 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 Belgium (proxy 2.4 % lower), followed by Czechia (proxy 2.3 % higher), Croatia (proxy 3.8% higher) and Sweden (proxy 2.5 % higher). In absolute terms the deviations were highest for Italy (underestimate by proxy of 4.1 Mt CO₂ eq.), Belgium (underestimate by 2.9 Mt CO₂ eq.), Czechia (overestimate of proxy by 2.9 Mt CO₂ eq.), Germany (overestimate by proxy of 7.2 Mt CO₂ eq.) and Poland (overestimate by proxy of 5.2 Mt CO₂ eq.). By comparing the percentage changes in emission levels 2017/2018 as derived from the 2019 proxy GHG inventory on the one hand and from the 2020 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 Slovakia, Sweden, Romania, Poland, Malta, Ireland and Czechia. 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. Ireland's both the emission changes in the proxy and in the final inventory were quite small. Iceland estimated emission increase more significant, than the one occurred in the official 2020 inventory submission.

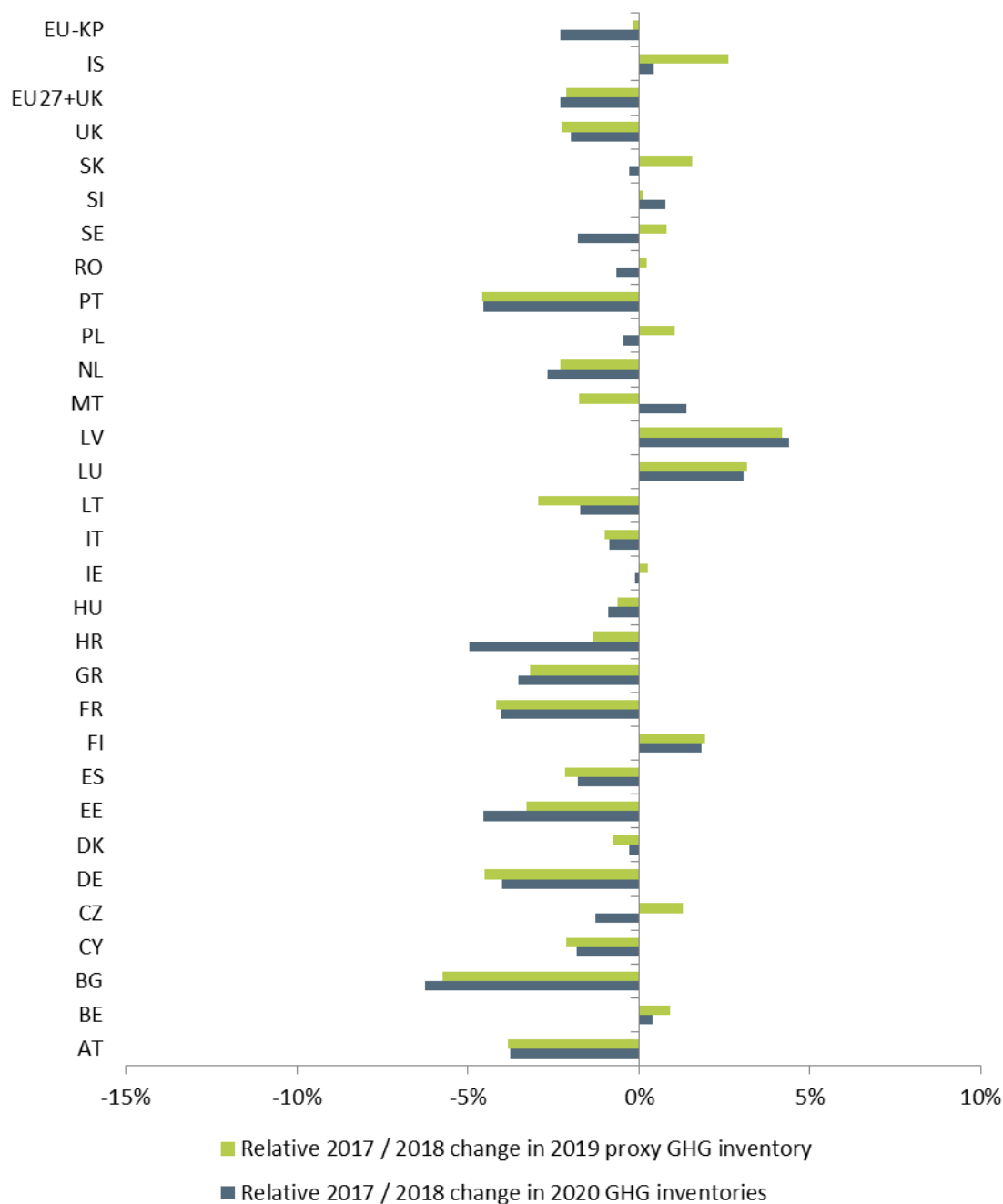
After taking into account recalculations, the relative differences were largest for Croatia (+3.6%) Czechia (+2.5%), Malta (-3.2%), Poland (+1.5%), Sweden (+2.6%) and Slovakia (+1.9%).

Table 3-1 Difference per Member State for year 2018 between proxy and final GHG inventories

MS	Inventory 2018 (Submission 2020)	Proxy 2018 (Submission 2019)	Deviation 2018	Recalculations	Deviation 2018 cleared of impact of recalculations	Proxy calculated by
	kt CO ₂ eq			%		
AT	78 950	79 103	153	0.2%	-0.3%	-0.1% MS
BE	118 456	115 568	-2 887	-2.4%	3.0%	0.6% MS
BG	57 816	57 854	38	0.1%	0.5%	0.6% ETC/CME
CY	8 812	8 773	-39	-0.4%	0.1%	-0.3% ETC/CME
CZ	128 139	131 036	2 896	2.3%	0.3%	2.6% MS
DE	858 369	865 567	7 198	0.8%	-1.4%	-0.5% MS
DK	48 224	47 525	-698	-1.4%	1.0%	-0.5% MS
EE	19 974	20 194	220	1.1%	0.2%	1.3% MS
ES	334 255	332 842	-1 413	-0.4%	0.0%	-0.4% MS
FI	56 411	56 461	50	0.1%	0.0%	0.1% MS
FR	444 823	445 274	450	0.1%	-0.2%	-0.1% MS
GR	92 222	92 393	171	0.2%	0.2%	0.4% MS
HR	23 793	24 688	896	3.8%	0.0%	3.8% MS
HU	63 220	63 388	168	0.3%	0.0%	0.3% MS
IE	60 935	60 906	-29	0.0%	0.4%	0.4% MS
IT	427 529	423 478	-4 051	-0.9%	0.8%	-0.1% MS
LT	20 267	20 093	-174	-0.9%	-0.4%	-1.3% MS
LU	10 547	10 561	14	0.1%	0.0%	0.1% MS
LV	11 727	11 800	73	0.6%	-0.8%	-0.2% MS
MT	2 186	2 171	-15	-0.7%	-2.4%	-3.1% MS
NL	188 197	189 244	1 047	0.6%	-0.2%	0.4% MS
PL	412 856	418 088	5 231	1.3%	0.2%	1.5% MS
PT	67 417	67 505	89	0.1%	-0.1%	0.0% MS
RO	116 115	114 038	-2 077	-1.8%	2.7%	0.9% ETC/CME
SE	51 779	53 084	1 305	2.5%	0.1%	2.6% MS
SI	17 502	17 473	-29	-0.2%	-0.5%	-0.7% MS
SK	43 348	44 121	773	1.8%	0.1%	1.9% MS
UK	462 102	459 856	-2 246	-0.5%	0.2%	-0.3% MS
EU27+UK	4 225 970	4 233 085	7 115	0.2%	0.0%	0.2% ETC/CME
IS	4 857	4 890	33	0.7%	1.5%	2.1% MS
EU-KP	4 230 827	4 321 414	90 587	2.1%	0.0%	2.1% ETC/CME

Source: Member States submissions to UNFCCC and proxy estimates for 2018.

Figure 3-1 Relative difference between proxy and submitted inventories by Member State 2017/2018



Source: Member States submissions to UNFCCC and proxy estimates for 2018.

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.1 Energy industries [Energy] (+82.3 Mt CO₂ eq.) and 1.A.4 Other sectors [Energy] (+27.9 Mt CO₂ eq.). The next largest differences were in 1.A.2 Manufacturing industries and construction [Energy] (-17.8 Mt CO₂ eq.), 2.F Product uses as ODS substitutes [IPPU] (+10.7 Mt CO₂ eq.) and 1.A.3 Transport [Energy] (-4.3 Mt CO₂ 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 2.H Other [IPPU] (-74.1 %), 3.F Field burning of agricultural residues

[Agriculture] (+34%), 2.E Electronic industry [IPPU] (+28.3%), 2.F Product uses as ODS substitutes [IPPU] (+10.4%), 3.H Urea application [Agriculture] (+10.4%) and 5.C Incineration and open burning of waste [Waste] (+24.6%), see Table 3-2. So 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 2020 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 2020 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.1 Energy industries (+7.5 %) and for 1.A.5 Other (-5.9%). For 1.B Fugitive emissions deviations after recalculations are +1%. In Sector 2 (Industrial processes & product use) there were considerable recalculations for some subsectors. This sector has the largest deviations even after taking recalculations effects into account. The largest relative deviations occurred in 2.H Other (-11.9 %). The largest absolute difference was in subsector 2.F Product use as ODS substitutes (+10.8 Mt CO₂ eq. or +10.4 %) followed by 2.A Mineral products (-1.6 Mt CO₂ eq. resp. -1.5 %). After taking into account the recalculations effect, the deviation decreases for the 2.H Other down to -74.1%. For the IPPU sector overall after allowing for recalculations the deviation is 2.6 %.

The agricultural sector has still a relative large deviation (-0.4 %) after allowing for recalculations. The largest absolute deviations were in 3.D Agricultural soils (-2.7 Mt CO₂ eq. resp. -1.6 %) and 3.A Enteric Fermentation (-2.2 Mt CO₂ eq. resp. -1.1 %). After considering recalculation effects the deviation for these subsectors was only slightly reduced.

After taking the recalculations effect into consideration, the deviation for the waste sector still indicates, that emissions in the waste sector were still underestimated by 0.7 %. The largest absolute deviation was found in subsector 5.A Solid waste disposal (-1.9 Mt CO₂ eq. or -1.9 %). The emission of these sector dominate the total waste sector emissions and even after considering recalculations the deviation of 5.A emissions were still underestimated (-2.2 %). The deviations of all other waste subsectors are less than +/- 0.8 Mt CO₂ eq.

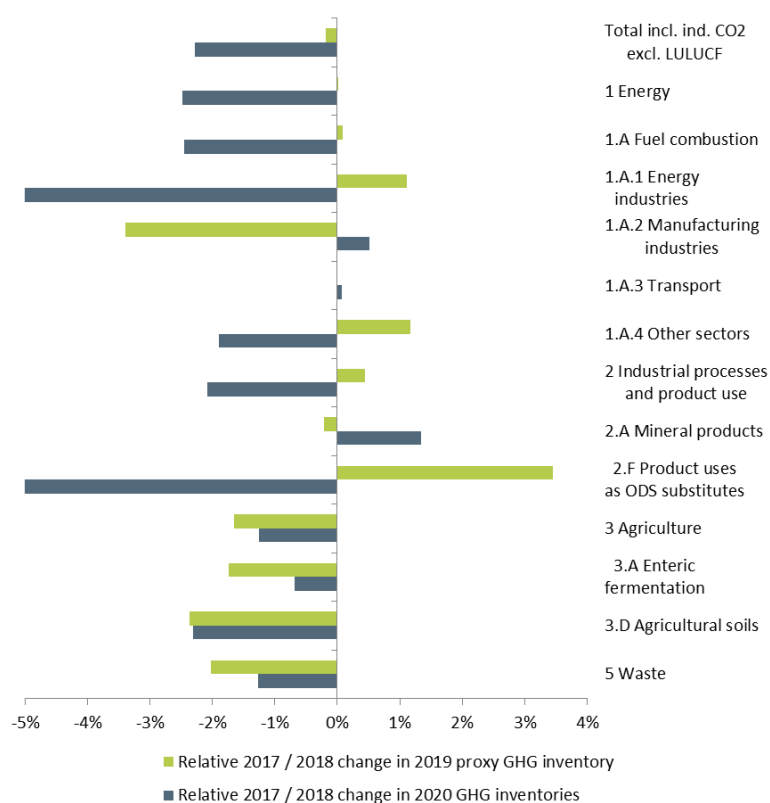
The differences for estimates for indirect CO₂ are significant (-7.7 % before and -6.3 % after considering recalculation effects). However the absolute amounts of indirect CO₂ emissions have only a very small share in total EU emissions.

By comparing the percentage changes in emission levels 2017/2018 as derived from the 2019 proxy GHG inventory on the one hand and from the 2020 official GHG inventory submissions to UNFCCC on the other by sectors, the differences are in the same order of magnitude in sectors with more than 100 Mt CO₂ eq., see Figure 3-2.

Table 3-2 Difference per sector for year 2018 between proxy and final GHG inventories

Sector	Inventory 2018 (Submission 2020)	Proxy 2018 (Submission 2019)	Deviation 2018	Recalculations	Deviation 2018 cleared of impact of recalculations
	kt CO ₂ eq				
Total incl. indirect CO₂ excl. LULUCF	4 230 827	4 321 414	90 587	2.1%	0.0%
1 Energy	3 281 115	3 370 147	89 031	2.7%	-0.2%
1.A Fuel combustion	3 198 315	3 286 109	87 794	2.7%	-0.1%
1.A.1 Energy industries	1 110 145	1 192 453	82 308	7.4%	0.1%
1.A.2 Manufacturing industries	500 825	483 059	-17 766	-3.5%	-0.3%
1.A.3 Transport	951 103	946 849	-4 254	-0.4%	0.4%
1.A.4 Other sectors	630 038	657 939	27 900	4.4%	-1.2%
1.A.5 Other	6 203	5 809	-394	-6.3%	0.5%
1.B Fugitive emissions	82 800	84 037	1 237	1.5%	-0.5%
2 Industrial processes & product use	373 938	381 171	7 233	1.9%	0.6%
2.A Mineral products	112 148	110 512	-1 636	-1.5%	-0.1%
2.B Chemical industry	65 297	64 558	-739	-1.1%	2.4%
2.C Metal production	75 682	74 484	-1 198	-1.6%	2.6%
2.D Non-energy products	9 703	10 183	480	4.9%	-1.4%
2.E Electronic Industry	825	803	-22	-2.6%	30.9%
2.F Product uses as ODS substitutes	98 396	109 162	10 766	10.9%	-0.6%
2.G Other product manufacture and use	11 512	11 138	-374	-3.2%	1.2%
2.H Other	375	331	-45	-11.9%	-62.3%
3 Agriculture	435 898	432 325	-3 572	-0.8%	0.4%
3.A Enteric fermentation	194 038	191 837	-2 201	-1.1%	0.1%
3.B Manure management	63 269	64 329	1 059	1.7%	-1.4%
3.C Rice cultivation	2 532	2 578	46	1.8%	-1.3%
3.D Agricultural soils	163 254	160 598	-2 656	-1.6%	1.6%
3.F Field burning of agricultural residues	635	863	228	35.9%	-1.8%
3.G Liming	6 008	5 534	-474	-7.9%	0.3%
3.H Urea application	4 253	4 670	417	9.8%	0.6%
3.I Other carbon-containing fertilizers	300	318	18	6.0%	0.5%
3.J Other	1 607	1 598	-9	-0.6%	-1.5%
5 Waste	138 265	136 283	-1 982	-1.4%	0.7%
5.A Solid waste disposal	99 257	97 332	-1 924	-1.9%	-0.3%
5.B Biological treatment of solid waste	8 245	7 511	-733	-8.9%	9.0%
5.C Incineration & open burning of waste	4 052	4 250	197	4.9%	19.7%
5.D Waste water treatment & discharge	26 619	27 094	475	1.8%	-0.4%
5.E Other	92	96	4	3.9%	-2.5%
Indirect CO₂	1 612	1 488	-123	-7.7%	1.3%

Figure 3-2 Relative difference between proxy and submitted inventories by sector 2017/2018



Source: Member States submissions to UNFCCC and proxy estimates for 2018.

Note: Only sectors with GHG emissions of more than 100 Mt CO₂ eq. in 2018 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 2019 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) 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/ACM 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. In recent years, submissions of approximated greenhouse gas inventories were only missing for Bulgaria and Cyprus. These two countries combined have only a share of 1.5 % of the emissions of the whole EU. Therefore these were gap-filled this year by ETC/CME for EEA 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 under the EEA MMR

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 EUTL¹²;
- The percentage change in CO₂ emissions in energy use between 2019 and 2018 in the EU from Eurostat newsrelease 78/2020, 6 May 2020.

Early estimates of CO₂ emissions from energy use are computed by Eurostat based on monthly energy statistics and using a harmonised methodology. These data may slightly differ from those published nationally. (Eurostat newsrelease, 2019)

Based on these data sources, emission estimates for year 2019 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

¹² European Union Emissions Trading System data viewer, 25 August 2020 <https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1>

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 news release 78/2020	early May
GHG inventory data from CRF files (via UNFCCC)	early June
Eurocontrol flight and emissions data	Early September

Source: ETC/CME

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 2020 estimates for the 2019 proxy inventory were based on the national methodologies used for 2020 inventory submissions (covering emissions until 2018). Thus, revised methodologies and parameters at Member States level can result in differences between the final inventory and the proxy inventory.

4.3.1 CO₂ emissions from 1. Energy subsectors

For the proxy year estimation, the previous year CO₂ value from each 1. Energy subsector from summarytable2 was multiplied by the percentage change of CO₂ 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 CO₂ in source category 1. sub sector in the proxy year

$E_{1,GHG}^{Y-2}$ Emission of CO₂ in source category 1. sub sector in the previous year

$\frac{E_{1,GHG}^{Y-1}}{E_{1,GHG}^{Y-2}} \%$ Change in energy use between the previous year and the proxy year. The value is from Eurostat.

(Eurostat newsrelease, 2020)

4.3.2 IPPU emissions from mineral and metal industries

To estimate CO₂ emissions from 2.A Mineral industry and CO₂, CH₄ and N₂O emissions from 2.C Metal industry, the following calculation was performed.

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

$E_{2A/2C,GHG}^{Y-1}$ Emission of CO₂, CH₄ or N₂O 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 CO₂, CH₄ or N₂O 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 (2018) were used as proxy estimates for the year 2019. Also for all emissions of fluorinated greenhouse gases (HFCs, PFCs, SF₆, NF₃) 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, Sweden and the United Kingdom. In some cases the amendments involved simply including subtotals or totals - for Greece, Luxemburg, Malta and Poland these amendments were necessary.

4.4.1 Total CO₂ eq., including indirect CO₂, without LULUCF in ETS and non-ETS

Most Member States did report *Total CO₂ equivalent emissions, without LULUCF*. There has however been some ambiguity about how to report included indirect CO₂ emissions. In previous years, a total was included in cell J68 whether or not the total included indirect CO₂ emissions. Many MS leave this cell blank even if they do report indirect CO₂ 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 CO₂ 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-gases¹³) 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, Sweden and the United Kingdom 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 and Cyprus (described in section 4.3 **Error! Reference source not found.**), calculates proxy estimates for whole of the IPPU sector. For these Member States the F-gas emissions were distributed in the same way as for Germany, Sweden and the United Kingdom using allocations derived from reports for the previous year.

4.4.3 Romania

Romania has submitted its approximated inventory for a first time. The approximated inventory was gap-filled for the Energy sector using the approach described in the chapter 4.3.1 .

4.4.4 Sweden

The submission contained only total GHG estimates at sector level, and apart from Fuel combustion, were not disaggregated into subsectors. To gap-fill these subcategories emissions were allocated against relevant gases and sub-sectors based on the subsector to sector ratios of Sweden's 2018 inventory Summary2 table.

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.

4.4.5 United Kingdom

In United Kingdom's Summary2 proxy for 2019 only CO₂ emissions are shown with detailed emissions per source category. Estimates for all other GHG emissions are only given as totals per gas. To gap-fill the CH₄ and N₂O for the relevant sub-categories total CH₄ and N₂O emission estimate for 2019 was split into the

¹³ F-gas emissions include emission of the following gases or groups of gases: hydrofluorocarbons = HFCs; perfluorocarbons = PFCs; sulphur hexafluoride = SF₆; nitrogen trifluoride = NF₃.

subcategories using shares based on the subsector to sector ratios of UK's 2018 inventory Summary2 table.

The total F-gas emissions of UK were allocated to individual source subcategories of Industrial Processes and Product Use as described in chapter 4.4.2.

As mentioned in the description box below the proxy Summary2 table, CH₄ and N₂O from LULUCF emissions were included in the CH₄ and N₂O net emission totals. This was adjusted by subtracting the 2018 amounts of CH₄ and N₂O LULUCF emissions reported from the most recent relevant submission.

The UK included ETS emissions per sector but did not provide a total of ETS emissions. And the non-ETS was only CO₂ non-ETS (no non-CO₂). For these reasons UK ETS was gap-filled with verified emissions amounts reported under the EU-ETS and recorded in the EUTL.

5 References

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Annex 1: Detailed results for each Member State

Country	Compiled by	Submission date
Austria	Member State	29 July 2020
Belgium	Member State	1 August 2020
Bulgaria	EEA, ETC/CME	
Cyprus	EEA, ETC/CME	
Czechia	Member State	22 July 2020
Germany	Member State	10 July 2020
Denmark	Member State	31 July 2020
Estonia	Member State	13 July 2020
Spain	Member State	28 June 2020
Finland	Member State	11 June 2020
France	Member State	24 July 2020
Greece	Member State	16 July 2020
Croatia	Member State	28 July 2020
Hungary	Member State	30 July 2020
Ireland	Member State	28 July 2020
Italy	Member State	31 July 2020
Lithuania	Member State	31 July 2020
Luxembourg	Member State	30 July 2020
Latvia	Member State	17 July 2020
Malta	Member State	28 July 2020
Netherlands	Member State	27 July 2020
Poland	Member State	27 July 2020
Portugal	Member State	15 July 2020
Romania	Member State	29 July 2020
Sweden	Member State	07 July 2020
Slovenia	Member State	28 July 2020
Slovakia	Member State	15 July 2020
United Kingdom	Country	29 July 2020
European Union (EU27+UK)	EEA, ETC/CME	
Iceland	Country	08 July 2020
European Union and Iceland (EU – KP)	EEA, ETC/CME	
Switzerland	Country	11 July 2020
Norway	Country	22 July 2020
Turkey	Country	12 August 2020

Austria (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Austria
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	CO ₂ equivalent (Gg)	
										ETS	non-ETS
Total (net emissions)⁽¹⁾	68 356.76	6 322.99	3 383.79	1 814.38	32.52	434.28	0.00	16.51	80 361.23		
1. Energy	53 935.21	577.30	636.74						55 149.25	15 392.57	39 756.68
A. Fuel combustion (sectoral approach)	53 807.96	334.21	636.74						54 778.91	15 392.57	39 386.34
1. Energy industries	10 320.08	24.91	99.52						10 444.50	8 638.49	1 806.01
2. Manufacturing industries and construction	10 650.73	20.14	125.15						10 796.02	6 207.03	4 588.98
3. Transport	24 392.37	21.14	265.19						24 678.70	547.04	24 131.66
4. Other sectors	8 394.00	267.98	145.89						8 807.88		8 807.88
5. Other	50.78	0.04	0.99						51.81		51.81
B. Fugitive emissions from fuels	127.25	243.09	0.00						370.34		370.34
1. Solid fuels	NO,IE,NA	NO,IE,NA	NO,IE,NA						0.00		0.00
2. Oil and natural gas	127.25	243.09	NO,IE,NA						370.34		370.34
C. CO ₂ transport and storage	NO								0.00		0.00
2. Industrial processes and product use	14 301.51	45.63	99.42	1 814.38	32.52	434.28	NA	16.51	16 744.24	14 171.26	2 572.98
A. Mineral industry	2 825.08								2 825.08	2 825.08	0.00
B. Chemical industry	706.89	45.63	56.36	NA	NA	NA	NA	NA	808.88	718.15	90.73
C. Metal industry	10 628.03	NO,IE,NA	NO		0.00	5.59	NA		10 633.62	10 628.03	5.59
D. Non-energy products from fuels and solvent use	141.50	NA	NA						141.50		141.50
E. Electronic Industry				5.14	32.52	28.39	NA	16.51	82.55		82.55
F. Product uses as ODS substitutes				1 809.24	NO,IE		NO		1 809.24		1 809.24
G. Other product manufacture and use	NO,NA	NO,NA	43.06	NO	NO	400.30	NO		443.36		443.36
H. Other	NA	NA	NA				NO		NA		0.00
3. Agriculture	117.98	4 615.63	2 381.86						7 115.47		
A. Enteric fermentation		4 068.27							4 068.27		
B. Manure management		546.82	440.74						987.56		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA	1 941.03						1 941.03		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		0.54	0.09						0.63		
G. Liming	94.10								94.10		
H. Urea application	23.89								23.89		
I. Other carbon-containing fertilizers	NA								NO		
J. Other	NA	NA	NA						NA		
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	2.06	1 084.43	265.78						1 352.27		
A. Solid waste disposal	NO,NA	981.68							981.68		
B. Biological treatment of solid waste		78.74	97.92						176.66		
C. Incineration and open burning of waste	2.06	0.00	0.01						2.07		
D. Waste water treatment and discharge		24.02	167.85						191.87		
E. Other	NO	NO	NO						NA		
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA	NA
Memo items:⁽²⁾											
International bunkers	2 843.51	0.44	23.96						2 867.92		
Aviation	2 799.30	0.42	20.75						2 820.48		
Navigation	44.21	0.02	3.21						47.44		
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass											
CO₂ captured	NO								NO		
Long-term storage of C in waste disposal sites									0.00		
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									80 361.23	29 563.83	50 797.40
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

(1) For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.
(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:

(http://www.statistik.at/web_de/statistiken/energie_und_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/energiebilanzen/index.html)

The most important trends 2018-2019 in fuel consumption by type of fossil fuel are:

Sales of transport diesel and gasoline both increased by +1% (approx. +0.28 Mt of CO₂ from diesel and gasoline).

Sales of heating gasoil increased by +0.6% (approx. +0.02 Mt of CO₂).

Natural gas consumption of end consumers increased by 3.9% (approx. +0.6 Mt of CO₂)

(<http://www.e-control.at/de/statistik/gas>)

CO₂ emissions from coal power plants (1.A.1.a) decreased by -0.2 Mt due to the decommissioning of a coal plant.

CO₂ emissions from iron and steel industries (1.A.2.a and 2.C.1) increased by +9% (approx -0.9 Mt CO₂) due to an increase in crude steel production (+8%).

(<https://www.worldsteel.org/steel-by-topic/statistics.html>)

N₂O emissions from product use (2.G) have been revised (-0.09 Mt CO₂ equivalent) according to a revised estimate provided by Austria during the ESD comprehensive review 2020.

Agriculture: Fertilizer Use: two-year mean value decreased by -8.1% (<https://www.ama.at/Marktinformationen/Getreide-und-Olsaaten/Dungemittel>)

Animals numbers: total cattle decreased by -1.7% and milk cows decreased by -1.2% while milk yield increased by +1.1%; swine number decreased by -0.1%

(<https://www.ama.at/Marktinformationen/Vieh-und-Fleisch/Produktion>)

Belgium (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Year	Proxy 2019
Submission	July 2020
Country	Belgium

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	99641.37	7849.15	5725.26	4469.84	131.32	95.08	0.00	0.65	117912.66		
1. Energy	85030.10	1046.14	734.91						86811.14	28955.92	57855.23
A. Fuel combustion (sectoral approach)	84914.00	507.48	734.91						86156.38	28840.29	57316.09
1. Energy industries	20495.83	27.67	167.12						20690.61	18492.70	2197.91
2. Manufacturing industries and construction	14070.44	42.84	174.54						14287.82	10135.53	4152.29
3. Transport	26 163.28	18.19	279.40						26460.87	155.01	26 305.85
4. Other sectors	24078.38	418.62	112.77						24609.77	57.05	24552.72
5. Other	106.08	0.16	1.08						107.32		107.32
B. Fugitive emissions from fuels	116.10	538.66	0.00						654.76	115.62	539.14
1. Solid fuels	NO	40.70	NO,NA						40.70		40.70
2. Oil and natural gas and other emissions from energy production	116.10	497.96	NO,IE,NA						614.06	115.62	498.44
C. CO ₂ transport and storage	NO										
2. Industrial processes and product use	15260.56429	23.88045	802.14	4 469.84	131.32	95.08	NO,NA	0.65	20783.46897	15349.79	5433.68
A. Mineral industry	4546.66								4546.65951	4546.66	0.00
B. Chemical industry	6524.26	6.73	741.54	1 619.55	120.42	NO,NA	NA	NA	9 012.50	6737.83	2274.67
C. Metal industry	4034.36	17.15	NO						4 051.51	4034.36	17.15
D. Non-energy products from fuels and solvent use	124.34	NO,NA	NO,NA						124.34		124.34
E. Electronic Industry				1.73	10.89	7.40	NO	0.65	20.67		20.67
F. Product uses as ODS substitutes				2 848.55	0.01				2 848.56		2848.56
G. Other product manufacture and use	NO	NO	60.61	NO	NO	87.68	NO	NO	148.28		148.28
H. Other	30.95	NO,NA	NO,NA	NO	NO	NO	NO	NO	30,94789	30.95	0.00
3. Agriculture	190.47	5 812.33	3 958.08						9 960.88		9960.88
A. Enteric fermentation		4 558.37							4 558.37		4558.37
B. Manure management		1 253.95	676.35						1 930.30		1930.30
C. Rice cultivation		NO							NO		NO
D. Agricultural soils		NA	3 281.74						3 281.74		3281.74
E. Prescribed burning of savannahs		NO	NO						NO		NO
F. Field burning of agricultural residues		NO	NO						NO		NO
G. Liming	137.76								137.76		137.76
H. Urea application	52.71								52.71		52.71
I. Other carbon-containing fertilizers	NO								NO		NO
J. Other	NO	NO	NO						NO		NO
4. Land use, land-use change and forestry⁽¹⁾	-1 115.60	NO,NA	100.98						-1 014.62		
A. Forest land	-1 251.72	NO	0.03						-1 251.69		
B. Cropland	779.51	NO	61.41						840.92		
C. Grassland	-817.35	NO	3.59						-813.76		
D. Wetlands	-6.67	NO,NA	0.05						-6.62		
E. Settlements	461.24	NO	35.90						497.14		
F. Other land	NO	NO	NO						NO		
G. Harvested wood products	-280.61								-280.61		
H. Other	NO	NO	NO						NO		
5. Waste	275.83	966.81	129.15						1371.79	243.14	1128.65
A. Solid waste disposal	NO,NA	772.30							772,29909		772.30
B. Biological treatment of solid waste		16.25	24.79						41.04		41.04
C. Incineration and open burning of waste	275.83	0.00	0.18						276,01399	243.14	32.87
D. Waste water treatment and discharge		178.26	104.18						282.44		282.44
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	NO	NO						NO		
Memo items:⁽²⁾											
International bunkers	35 413.49	5.77	276.38						35 695.64		
Aviation	5 144.42	0.85	41.89						5 187.16		
Navigation	30 269.07	4.92	234.49						30 508.48		
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass	12 825.43								12 825.43		
CO₂ captured									NO		
Long-term storage of C in waste disposal sites									NA		
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									118 927.28		
Total CO₂ equivalent emissions with land use, land-use change and forestry									117 912.66		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									118 927.28		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									117 912.66		

(1) For carbon dioxide (CO₂) 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

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

Bulgaria (EEA calculation)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Proxy inventory 2019
EEA calculations 2020v1
BULGARIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	33142.18	6757.05	5736.43	2252.53	0.01	17.99	NO,NA	NO,NA	47906.19		
1. Energy	37769.80	1494.15	319.57						39583.51		
A. Fuel combustion (sectoral approach)	37086.39	357.39	318.73						37762.51		
1. Energy industries	22449.46	18.29	112.11						22579.85		
2. Manufacturing industries and construction	4054.20	13.23	29.21						4096.64		
3. Transport	9196.46	21.77	89.22						9307.45		
4. Other sectors	1386.27	304.11	88.19						1778.57		
5. Other	NO	NO	NO						0.00		
B. Fugitive emissions from fuels	683.41	1136.76	0.84						1821.01		
1. Solid fuels	25.01	903.45	NO						844.50		
2. Oil and natural gas	658.40	233.30	0.84						878.03		
C. CO ₂ transport and storage	NO								NO		
2. Industrial processes and product use	4292.50	NO,NA	127.59	2252.53	0.01	17.99	NO,NA	NO,NA	6690.63		
A. Mineral industry	2623.92	NO,NA							2623.92		
B. Chemical industry	1339.93	NO,NA	115.64	NA	NA	NA	NA	NA	1455.57		
C. Metal industry	205.71	NO,NA	NA	NA	NA	NA	NA	NA	205.71		
D. Non-energy products from fuels and solvent use	98.67	NO,NA	NO,NA						98.67		
E. Electronic Industry				NO	NO	NO	NO	NO	NO		
F. Product uses as ODS substitutes				2252.53	0.01	NO	NO	NO	2252.54		
G. Other product manufacture and use	24.27	NO	11.96		NO	17.99			54.22		
H. Other	NA	NA	NA						NA		
3. Agriculture	33.74	1736.84	4645.11						6415.69		
A. Enteric fermentation		1490.19							1490.19		
B. Manure management		119.83	473.82						593.65		
C. Rice cultivation		99.10							99.10		
D. Agricultural soils		NO	4163.41						4163.41		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		27.72	7.87						35.59		
G. Liming	NO								NO		
H. Urea application	33.74								33.74		
I. Other carbon-containing fertilizers	NO								NO		
J. Other											
4. Land use, land-use change and forestry⁽¹⁾	-8960.63	3.38	496.64						-8460.61		
A. Forest land	-7573.26	3.38	111.99						-7457.89		
B. Cropland	586.12	NO	141.25						727.37		
C. Grassland	-1666.57	NO	57.55						-1609.03		
D. Wetlands	265.99	NO	30.70						296.69		
E. Settlements	601.92	NO	64.34						666.26		
F. Other land	NO	NO	NO						NO		
G. Harvested wood products	-1174.82								-1174.82		
H. Other	NO	NO	NO						NO		
5. Waste	6.77	3522.68	147.52						3676.96		
A. Solid waste disposal	NO	2741.32							2741.32		
B. Biological treatment of solid waste		9.55	6.83						16.39		
C. Incineration and open burning of waste	6.77	0.00	0.97						7.74		
D. Waste water treatment and discharge		771.80	139.72						911.52		
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	1029.02	0.89	9.08								1038.99
Aviation	772.16	0.29	7.04								808.31
Navigation	256.87	0.60	2.04								259.50
Multilateral operations	NO	NO	NO								NO
CO ₂ emissions from biomass	7528.15										7528.15
CO ₂ captured	NO,IE										NO,IE
Long-term storage of C in waste disposal sites	NE										NE
Indirect N ₂ O			1080.90								
Indirect CO ₂ ⁽³⁾	NO										
Total CO₂ equivalent emissions without land use, land-use change and forestry									56366.80	29194.151	27172.65
Total CO₂ equivalent emissions with land use, land-use change and forestry									47906.19		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									56366.80		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									47906.19		

Color codes	Calculated value
	Previous year value
	ETS value
	No value

Cyprus (EEA calculation)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Proxy inventory 2019
EEA calculations 2020v1
Cyprus

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	6888.10	885.29	297.26	297.14	0.00	0.17	NO,NA	NO,NA	8367.95		
1. Energy	6438.99	15.16	25.58						6479.73		
A. Fuel combustion (sectoral approach)	6438.99	15.16	25.58						6479.73		
1. Energy industries	3342.36	3.32	7.84						3353.52		
2. Manufacturing industries and construction	549.60	2.20	3.80						555.60		
3. Transport	2051.24	3.67	12.50						2067.41		
4. Other sectors	471.92	5.89	1.38						479.19		
5. Other	23.87	0.08	0.06						24.01		
B. Fugitive emissions from fuels	NO,NE	NO,NE	NO						0.00		
1. Solid fuels	NO	NO	NO						NO		
2. Oil and natural gas	NO,NE	NO,NE	NO						0.00		
C. CO ₂ transport and storage	NO								NO		
2. Industrial processes and product use	849.11	NO,NE,NA	64.91	297.14	NO	0.17	NO	NO	1211.33		
A. Mineral industry	818.98								818.98		
B. Chemical industry	NO	NO	NO						NO		
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO		
D. Non-energy products from fuels and solvent use	30.12	NE,NA	NE,NA						30.12		
E. Electronic Industry				NO	NO	NO	NO	NO	NO		
F. Product uses as ODS substitutes				297.14	NO	NO	NO	NO	297.14		
G. Other product manufacture and use	0.01	NE	64.91		NO	0.17			65.09		
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO		
3. Agriculture	0.22	311.87	187.30						499.40		
A. Enteric fermentation		261.53							261.53		
B. Manure management		50.17	68.08						118.25		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NE	119.17						119.17		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		0.18	0.05						0.23		
G. Liming	NO								NO		
H. Urea application	0.22								0.22		
I. Other carbon-containing fertilizers	NO								NO		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	-400.22	0.75	0.26						-399.22		
A. Forest land	-163.45	0.75	0.26						-162.44		
B. Cropland	-153.77	NE	NE						-153.77		
C. Grassland	-124.72	NO,NE	NE						-124.72		
D. Wetlands	-9.01	NE	NO,NE						-9.01		
E. Settlements	20.09	NO,NE	NO,NE						20.09		
F. Other land	6.51	NO,NE	NO,NE						6.51		
G. Harvested wood products	24.12								24.12		
H. Other	NO	NO	NO						NO		
5. Waste	NO,NA	557.51	19.20						576.71		
A. Solid waste disposal	NO,NA	504.98							504.98		
B. Biological treatment of solid waste		3.31	2.37						5.68		
C. Incineration and open burning of waste	NO	NO	NO						NO		
D. Waste water treatment and discharge		49.22	16.83						66.05		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)											
Memo items:⁽²⁾											
International bunkers	1894.30	1.76	18.24						1914.30		
Aviation	1037.11	0.18	8.65						1035.32		
Navigation	857.19	1.58	9.60						868.37		
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass	288.70								288.70		
CO₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	NE								NE		
Indirect N₂O			NE								
Indirect CO₂⁽³⁾	NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									8767.17	4461.278	4305.89
Total CO₂ equivalent emissions with land use, land-use change and forestry									8367.95		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									8767.17		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									8367.95		

Color codes	Calculated value
	Previous year value
	ETS value
	No value

Czechia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Czech Republic

Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	120404.37	12611.14	6014.60	3890.78	0.96	68.76	0.00	3.74	142994.35		
1. Energy	95012.28	3981.70	659.35						99653.33	48 741	50 912
A. Fuel combustion (sectoral approach)	94933.87	1022.34	659.34						96615.54	48 741	47 875
1. Energy industries	50475.95	34.90	238.40						50749.25	IE	IE
2. Manufacturing industries and construction	10125.20	36.47	58.57						10220.23	IE	IE
3. Transport	21117.98	23.72	210.01						21351.70	NO	21 352
4. Other sectors	12822.10	926.09	140.20						13888.39	NO	13 888.39
5. Other	392.64	1.16	12.16						405.96	NO	405.96
B. Fugitive emissions from fuels	78.41	2959.36	0.02						3037.79	NO	3 038
1. Solid fuels	74.41	2362.75	NO,NA						2437.16	NO	2 437
2. Oil and natural gas	4.00	596.61	0.02						600.63	NO	601
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	11649.16	63.08	672.67	3890.78	0.96	68.76	0.00	3.74	16349.16	10 105	6 244
A. Mineral industry	3137.16								3137.16	3 087	50
B. Chemical industry	1854.52	47.75	449.17	NO	NO	NO	NO	NO	2351.44	1 190	1 162
C. Metal industry	6509.31	15.34	NA	NO	NO	NO	NO	NO	6524.64	5 828	697
D. Non-energy products from fuels and solvent use	148.17	NO,NA	NO,NA						148.17	0	148
E. Electronic Industry				NO	0.56	3.14	NO,NE	3.74	7.44	0	7
F. Product uses as ODS substitutes				3890.74	0.40	NO	NO	NO	3891.14	0	3 891
G. Other product manufacture and use	NO	NO	223.50	NO	NO	65.62	NO	NO	289.12	0	289
H. Other	NO	NO	NO	0.04	NO	NO	NO	NO	0.04	0	0
3. Agriculture	346.84	3594.80	4379.67						8321.31		
A. Enteric fermentation		3055.51							3055.51		
B. Manure management		539.29	500.86						1040.15		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NO	3878.81						3878.81		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		NO	NO						NO		
G. Liming	161.37								161.37		
H. Urea application	185.47								185.47		
I. Other carbon-containing fertilizers	NO								NO		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	13259.32	46.00	34.40						13339.73		
A. Forest land	15800.00	46.00	32.00						15878.00		
B. Cropland	97.16	NO	2.40						99.56		
C. Grassland	-282.26	NO	NO,NA						-282.26		
D. Wetlands	20.36	NO,NA	NO,NA						20.36		
E. Settlements	124.07	NO,NA	NO,NA						124.07		
F. Other land	NO,NA	NO,NA	NO,NA						0.00		
G. Harvested wood products	-2500.00								-2500.00		
H. Other	NO	NO	NO						0.00		
5. Waste	136.78	4925.56	268.50						5330.83		
A. Solid waste disposal	0.00	3370.04							3370.04		
B. Biological treatment of solid waste		657.61	66.62						724.24		
C. Incineration and open burning of waste	136.78	0.00	2.48						139.26		
D. Waste water treatment and discharge		897.90	199.39						1097.30		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	1265.46	0.22	10.67						1276.35		
Aviation	1265.46	0.22	10.67						1276.35		
Navigation	NO	NO	NO						NO		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	18004.25								18004.25		
CO ₂ captured	NO,NE								0.00		
Long-term storage of C in waste disposal sites	45590.46								45590.46		
Indirect N ₂ O			237.88								
Indirect CO ₂ ⁽³⁾	642.17										
Total CO₂ equivalent emissions without land use, land-use change and forestry									129654.63	58 846	70808.95
Total CO₂ equivalent emissions with land use, land-use change and forestry									142994.35		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									130534.68		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									143874.41		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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.

Note to EU ETS data

The EU ETS data in 2C and 1A1 were adapted following the individual reallocation of one major iron and steel producer

Energy:

Approximated GHG inventory was created using linear regression (in some cases with using quadratic polynom) for the last 5 years and further extrapolation for year 2019. Linear regression was applied on the lowest levels of sectors and subsectors. This way a better accuracy was reached. No significant change of the total emission from Energy is expected in comparison with the previous years.

Transport

Key drivers are economic situation, fuel prices and changing demand on air transport

IPPU

Approximated GHG inventory was partly created using prediction model and partly with the most actual activity data (Mineral industry). Prediction model produces predicted values, obtained by evaluating the regression function in the selected time frame (in most cases time series 2010-2018). 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 2.H contains HFO-1234yf emission estimates related to category 2.F.1.e).

Agriculture

The approximate GHG inventory of the Agriculture sector was prepared partly with the most actual activity data (population of livestock, yield, consumption of mineral fertilizers) and partly based on the data from 2017 (urea application and liming used for cultivation). No regression trend was feasible for trend estimations because of the accidental fluctuation of activity data registered during the recent period. The total emissions are expected to remain almost at the same level as reported in the previous submission. No significant change of the total emissions from Agriculture is expected in comparison with the previous year.

LULUCF

Expected rise of the emissions due to continuing impact of previous years droughts and bark beetle calamity

Waste

The approximated GHG inventory was created using linear extrapolation of waste or gas production in most cases, for 5.B.2 the average of last 5 years was used because the values were almost the same and no trend was apparent, for wastewater some new activity data available but not for all variables. No big difference in the emissions is expected, only in the category 5.A new factor F (fraction of methane) is used (IPCC default instead of country specific) that decreases the emissions. Some smaller recalculations are also in plan.

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.

Note on ETS/non-ETS data for 2C1:

The mismatch in 2C is the result of differences in the underlying data structures. For the national inventory, the iron and steel statistic is used which contains separate fuel data for each process. In contrast, the aggregation level of ETS data varies considerably depending on the reporting structure of the plants. Some installations are separately permitted and therefore operators give more details. Other installations are permitted as integrated steel plants and operators report summarized emissions for the whole site. Therefore, a consistent allocation of national inventory data and ETS data is not possible. A relevant share of the ETS data reported under 2C is matched by inventory emissions reported under 1.A.2 and 1.A.1.c.

Description of estimation:

<https://www.umweltbundesamt.de/en/press/pressinformation/2019-greenhouse-gas-emissions-in-germany-declined>

Tables and graphs:
(German only)

<https://www.umweltbundesamt.de/galerie/entwicklung-der-treibhausgasemissionen-in-2019>

Denmark (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	31 308.79	7 293.14	5 368.81	340.87	0.00	71.86	0.00	0.00	44383.47		
1. Energy	29 616.51	328.63	392.50						30337.65	10828.99	19508.66
A. Fuel combustion (sectoral approach)	29 403.02	238.74	351.25						29993.00	10634.80	19358.20
1. Energy industries	8 212.76	81.31	62.66						8356.73	8201.93	154.81
2. Manufacturing industries and construction	3 786.40	21.93	61.82						3870.15	2397.14	1473.02
3. Transport	13 404.41	10.41	142.42						13557.24	0.00	13557.24
4. Other sectors	3 784.51	124.86	81.89						3991.25	35.74	3955.51
5. Other	214.94	0.22	2.46						217.62	0.00	217.62
B. Fugitive emissions from fuels	213.50	89.90	41.25						344.65	194.18	150.46
1. Solid fuels	NA,NO	NA,NO	NA,NO						NA,NO	NA	NA
2. Oil and natural gas and other emissions from energy production	213.50	89.90	41.25						344.65	194.18	150.46
C. CO ₂ transport and storage									NO	NA	NA
2. Industrial processes and product use	1 430.05	2.32	20.16	340.87	0.00	71.86	0.00	0.00	1865.26	1211.50	653.77
A. Mineral industry	1 267.43								1267.43	1211.50	55.94
B. Chemical industry	1.43	NA,NO	NA,NO	NA	NA	NA	NA	NA	1.43	0.00	1.43
C. Metal industry	0.12	NO	NO		NO	NO			0.12	0.00	0.12
D. Non-energy products from fuels and solvent use	160.80	0.51	0.14						161.46	0.00	161.46
E. Electronic Industry				NO	NO	NO	NO	NO	0.00	0.00	0.00
F. Product uses as ODS substitutes				340.87	0.00	NA	NA	NA	340.87	0.00	340.87
G. Other product manufacture and use	0.27	1.80	20.02	NA	NA	71.86	NA	NA	93.95	0.00	93.95
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Agriculture	244.18	5 990.08	4 807.00						11041.26	0.00	11041.26
A. Enteric fermentation		3 767.36							3767.36	0.00	3767.36
B. Manure management		2 219.30	733.09						2952.40	0.00	2952.40
C. Rice cultivation		NO	NO						NO	NO	NO
D. Agricultural soils		NE	4 072.85						4072.85	0.00	4072.85
E. Prescribed burning of savannahs		NO	NO						NO	NO	NO
F. Field burning of agricultural residues		3.42	1.06						4.48	0.00	4.48
G. Liming	239.92								239.92	0.00	239.92
H. Urea application	1.39								1.39	0.00	1.39
I. Other carbon-containing fertilizers	2.87								2.87	0.00	2.87
J. Other	NO	NO	NO						NO	NO	NO
4. Land use, land-use change and forestry⁽¹⁾											
A. Forest land											
B. Cropland											
C. Grassland											
D. Wetlands											
E. Settlements											
F. Other land											
G. Harvested wood products											
H. Other											
5. Waste	18.04	972.11	149.15						1139.30	0.00	1139.30
A. Solid waste disposal	NO,NA	560.39							560.39	0.00	560.39
B. Biological treatment of solid waste		358.88	83.49						442.38	0.00	442.38
C. Incineration and open burning of waste	NA,NO	0.02	0.28						0.30	0.00	0.30
D. Waste water treatment and discharge		50.76	65.38						116.13	0.00	116.13
E. Other	18.04	2.06	NA						20.10	0.00	20.10
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO		
Memo items:⁽²⁾											
International bunkers											
Aviation											
Navigation											
Multilateral operations											
CO₂ emissions from biomass											
CO₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N₂O											
Indirect CO₂⁽³⁾	281.05										
Total CO₂ equivalent emissions without land use, land-use change and forestry									44 383.47	12 040.48	32 342.99
Total CO₂ equivalent emissions with land use, land-use change and forestry									44 664.52		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									44 664.52		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									44 664.52		

(1) For carbon dioxide (CO₂) 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 emissions positive (+).

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

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 short term trend in Danish greenhouse gas emissions is dominated by the trend in the energy sector. This is caused by the open electricity market and especially the import/export of electricity within the Nordic electricity market. Changes in production of renewable energy (mainly hydropower) in the Nordic countries influences directly the need for fossil power generation in Denmark.

In 2019, the energy use decreased by 3.4 % to 724 PJ. There was a higher electricity import compared to 2018 and an increase in the production of renewable energy. As a result the coal consumption in the Danish power plants dropped significantly compared to 2018, in fact the consumption of solid fuels has never been lower in the 50 years the Danish Energy Agency has compiled the energy statistics. The consumption dropped to 39 PJ, which corresponds to only 5 % of the energy consumption. The consumption of natural gas also decreased with approximately 7.6 %. The consumption of oil products (mainly related to transport and mobile sources) increased by less than 1 %. The overall result is that emissions from fuel combustion are significantly lower in 2019 compared to 2018. More information on the preliminary energy statistics is available from the Danish Energy Agency (https://ens.dk/sites/ens.dk/files/Statistik/statistikdkeng_int.xlsx).

The split between subsectors in fuel combustion has been done using the change in gasoline and partially the diesel consumption as a proxy for the transport sector, while utilising ETS data as a proxy for manufacturing industries. For other sectors (mainly heating of buildings), the change in heating degree days has been used. It should be noted that the uncertainty of the split is much higher than for the total estimate for fuel combustion.

For industrial processes, most emissions of CO₂, CH₄ and N₂O have been assumed constant at 2018 levels. However, 2019 ETS information has been taken into account for cement production. For f-gases, the emissions of HFCs are expected to continue to decrease due to the measures in place to reduce the use of HFCs. For SF₆, the emissions have peaked, this is caused by the fact that SF₆ was used in double glazed windows and according to the model the lifetime of these windows started to expire in 2011 causing the remaining SF₆ to be emitted. Hence, the emissions of SF₆ increased since 2011 and now they decrease again.

Emissions from agriculture and waste have been kept constant at 2018 levels for the purpose of this proxy.

Estonia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Estonia
Geographical scope⁽¹⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	12693.48	1108.54	991.31	224.92	NO	2.74	NO	NO	15020.99		
1. Energy	12291.01	177.37	137.43						12605.82	8 132.45	4 473.37
A. Fuel combustion (sectoral approach)	12290.99	162.02	137.43						12590.44	8 132.45	4 457.99
1. Energy industries	8526.73	23.34	42.62						8592.69	7 790.56	802.13
2. Manufacturing industries and construction	546.66	4.55	7.39						558.60	333.84	224.75
3. Transport	2553.05	3.54	23.09						2579.69	5.17	2 574.51
4. Other sectors	615.04	130.53	63.54						809.11	2.87	806.24
5. Other	49.51	0.07	0.79						50.36	NO	50.36
B. Fugitive emissions from fuels	0.03	15.35	NO						15.38	NO	15.38
1. Solid fuels	NO	NO	NO						NO	NO	NO
2. Oil and natural gas	0.03	15.35	NO						15.38	NO	15.38
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	385.79	NO	3.06	224.92	NO	2.74	NO	NO	616.51	359.20	257.31
A. Mineral industry	359.23								359.23	359.20	0.03
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	2.46	NO	NO	NO	NO	NO	NO	NO	2.46	NO	2.46
D. Non-energy products from fuels and solvent use	24.11	NO	NO						24.11	NA	24.11
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				224.92	NO	NO	NO	NO	224.92	NA	224.92
G. Other product manufacture and use	NO	NO	3.06	NO	NO	2.74	NO	NO	5.80	NA	5.80
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	15.60	675.25	802.83						1493.67	NA	1493.67
A. Enteric fermentation		541.00							541.00		
B. Manure management		134.25	63.79						198.04		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NO	739.05						739.05		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		NO	NO						NO		
G. Liming	15.46								15.46		
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	1.08	255.92	47.99						304.99	NA	304.99
A. Solid waste disposal	NO	181.52							181.52		
B. Biological treatment of solid waste		21.65	15.48						37.13		
C. Incineration and open burning of waste	1.08	0.49	0.10						1.67		
D. Waste water treatment and discharge		52.26	32.41						84.67		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	1141.97	2.60	9.08						1153.64		
Aviation	208.21	0.37	1.75						210.33		
Navigation	933.76	2.23	7.33						943.32		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	5192.00								5192.00		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	NE								NE		
Indirect N ₂ O			NE								
Indirect CO ₂ ⁽³⁾	IE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									15020.99	8 491.64	6 529.35
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									15020.99		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

⁽¹⁾ For carbon dioxide (CO₂) 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 I.A.

⁽³⁾ In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect CO₂ the national totals shall be provided with and without indirect CO₂.

⁽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 2019 decreased 24.8% compared to 2018 (compared to total after ESD review recalculations) mainly due to decreased emissions in Energy sector. ETS emission have decreased by 38.7% in 2019 compared to 2018. According to the Proxy estimates ESD emissions have increased by 7% compared to 2018. The drivers underpinning the total GHG emission decrease are elaborated below.

Energy: Total GHG emissions in Energy sector have decreased 28.4% compared to year 2018 due to a decrease in emissions from Energy industries in the public electricity and heat production, because of the EU ETS CO₂ price increase and low electricity prices in 2019. The CO₂ price increase affected the electricity production of oil shale combustion plants, which had to be put on hold.

Agriculture: Total emissions from Agriculture sector in 2019 increased by 3.9% compared to 2018. The main increase of emissions in 2019 compared to the previous year occurred in 3.D Agricultural Soils subcategory (increased by 8,8%) as the cereal production increased which was caused by favourable weather conditions for

Waste: Starting from 2020, companies have to submit their waste reports in a new environment named KOTKAS (<https://kotkas.envir.ee/>). Because it is a new system then it takes longer to investigate the submitted reports and make a system to export data for compiling annual GHG inventory. Due to this, it is not possible to have generated, deposited, composted and burned waste activity data at this moment and activity data from 2020 submission was used for calculating emissions under 5 A, 5B, and 5C. 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 2020 submission was used for domestic wastewater emission calculation.

Spain (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 1
Country Spain
Geographical scope⁽⁴⁾ National total

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	211 996.1	39 971.2	18 121.1	4 304.4	52.4	226.9	1 307.3	NO,NA	275 979.5		
1. Energy	230 383.1	2 547.0	1 932.5						234 862.6	96 061	138 801
A. Fuel combustion (sectoral approach)	226 592.1	2 310.6	1 932.5						230 835.3	92 444	138 392
1. Energy industries	54 013.0	255.5	480.8						54 749.2	52 984	1 765
2. Manufacturing industries and construction	44 656.6	938.3	199.6						45 794.6	36 042	9 753
3. Transport	89 805.5	96.6	964.4						90 866.5	3 255	87 612
4. Other sectors	37 669.9	1 020.0	283.8						38 973.7	163	38 811
5. Other	447.1	0.3	3.9						451.2	0	451
B. Fugitive emissions from fuels	3 791.0	236.3	0.0						4 027.4	3 618	410
1. Solid fuels	7.4	75.4	NA,NE						82.8	0	83
2. Oil and natural gas	3 783.6	160.9	0.0						3 944.6	3 618	327
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	19 112.3	131.8	831.0	4 304.4	52.4	226.9	1 307.3	NO,NA	25 966.2	16 716	9 250
A. Mineral industry	11 828.6								11 828.6	11 682	147
B. Chemical industry	3 693.3	112.2	426.0	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	4 231.5	2 264	1 967
C. Metal industry	2 726.2	19.6	NA	NO,NA	40.9	NO,NA	NO,NA	NA	2 786.6	2 770	17
D. Non-energy products from fuels and solvent use	864.3	NA	NA						864.3	0	864
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				4 304.4	11.6	NO,NA	1 307.3	NO,NA	5 623.3	0	5 623
G. Other product manufacture and use	NO	NO	405.0	NO,NA	NO,NA	226.9	NO,NA	NO,NA	631.9	0	632
H. Other	IE,NA	IE,NA	0.1	NA	NA	NA	NA	NA	0.1	0	0
3. Agriculture	439.8	24 950.7	13 697.8						39 088.3		
A. Enteric fermentation		17 654.9							17 654.9		
B. Manure management		6 843.5	1 772.1						8 615.6		
C. Rice cultivation		433.2							433.2		
D. Agricultural soils		IE	11 919.7						11 919.7		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		19.1	5.9						25.0		
G. Liming	25.8								25.8		
H. Urea application	414.0								414.0		
I. Other carbon-containing fertilizers	NO								NO		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	-37 939.0	164.7	268.8						-37 505.5		
A. Forest land	-33 072.2	151.2	142.1						-32 778.9		
B. Cropland	-3 713.6	7.1	61.6						-3 644.9		
C. Grassland	-16.2	6.4	6.2						-3.6		
D. Wetlands	53.8	0.0	0.0						53.8		
E. Settlements	1 235.0	NO	57.0						1 292.0		
F. Other land	21.8	NO	1.9						23.6		
G. Harvested wood products	-2 447.5								-2 447.5		
H. Other	NO	NO	NO						NO		
5. Waste	NO,IE,NA	12 176.9	1 391.0						13 567.9		
A. Solid waste disposal	NO,NA	10 009.9							10 009.9		
B. Biological treatment of solid waste		380.2	256.7						637.0		
C. Incineration and open burning of waste	NO,IE	321.3	326.3						647.7		
D. Waste water treatment and discharge		1 464.7	807.9						2 272.6		
E. Other	NA	0.8	NA						0.8		
6. Other (as specified in summary 1.A)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Memo items:⁽²⁾											
International bunkers									41 215.1		
Aviation									19 605.1		
Navigation									21 610.0		
Multilateral operations									NO		
CO₂ emissions from biomass									29 625.0		
CO₂ captured									NO		
Long-term storage of C in waste disposal sites									NE		
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									313 485.0	112 777	200 708
Total CO₂ equivalent emissions with land use, land-use change and forestry									275 979.5		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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 emissions of -14%. <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>

1A1a: reduction of coal -66% and hydro: -27.6%, increased participation of renewable energies in the mix (wind +9.4%, photovoltaics +19% and solar thermal +16.8%) and increased gas +83.9% compared to 2018). <http://www.ree.es/es/estadisticas-del-sistema-electrico-espanol/balance-diario>

1A1b: reduction of ETS emissions in refinery sector (-3.6%). <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>

1A2: reduction of industrial activity (-1% in emissions).

1A3: rise of national aviation kerosene consumption (+3.5 %); rise of road fossil fuels (-0.4 % diesel; +5.7 % gasoline). <http://www.cores.es/es/estadisticas>

1A4: reduction of fuel consumption in RCI (-6.9%) and off-road machinery (-1.3%)

3A-3B: cattle rise (Non dairy: +1.4% and swine: +1.4%). <http://www.magrama.gob.es/es/estadistica/temas/estadisticas-agrarias/ganaderia/encuestas-ganaderas/#para4>

2F: decrease of F-gas Co₂-eq emissions in refrigeration by -8%.

Finland (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)

Inventory 2019
Submission 2020 proxy
FINLAND

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	22085.25	5176.85	6877.49	1162.27	1.78	20.03	NO	NO	35323.66		
1. Energy	37955.02	308.18	580.99						38844.18	19 355	19 252
A. Fuel combustion (sectoral approach)	37889.37	279.00	580.00						38748.37		
1. Energy industries	16470.00	41.00	273.00						16784.00		
2. Manufacturing industries and construction	5963.00	26.00	151.00						6140.00		
3. Transport	11211.00	12.00	88.00						11311.00		
4. Other sectors	3440.00	198.00	62.00						3700.00		
5. Other	805.37	2.00	6.00						813.37		
B. Fugitive emissions from fuels	65.64	29.18	0.99						95.81		
1. Solid fuels	NO	NO	NO						NO		
2. Oil and natural gas	65.64	29.18	0.99						95.81		
C. CO ₂ transport and storage	NO,NA								NA,NO		
2. Industrial processes and product use	4114.00	0.17	226.69	1162.27	1.78	20.03	NO	NO	5524.94	3 892	1 633
A. Mineral industry	996.45								996.45		
B. Chemical industry	1144.39	NA,NO	202.91	NO	NO	NO	NO	NO	1347.30		
C. Metal industry	1814.80	0.00	NO			NA,NO			1814.80		
D. Non-energy products from fuels and solvent use	158.37	0.16	0.98						159.51		
E. Electronic industry				NO,IE	NO,IE	NO,IE	NO	NO	NO,IE		
F. Product uses as ODS substitutes				1160.44	0.86				1161.30		
G. Other product manufacture and use	NO	NO	22.80	NO	NO	12.94	NO	NO	35.73		
H. Other	NO	NO	NO	1.83	0.92	7.09			9.84		
3. Agriculture	211.76	2493.06	3932.85						6637.67	0	6 638
A. Enteric fermentation		2040.00							2040.00		
B. Manure management		451.00	272.66						723.66		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NE,NO	3659.56						3659.56		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		2.06	0.64						2.69		
G. Liming	210.28								210.28		
H. Urea application	1.48								1.48		
I. Other carbon-containing fertilizers	NA								NA		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	-20195.53	769.44	2020.10						-17406.00		
A. Forest land	-28183.95	692.72	1890.14						-25601.08		
B. Cropland	8055.59	IE,NA	7.15						8062.74		
C. Grassland	728.18	0.03	0.77						728.98		
D. Wetlands	1923.65	76.69	98.52						2098.86		
E. Settlements	719.24	NE,NA	21.75						741.00		
F. Other land	NO,NA	NA	NA						NO,NA		
G. Harvested wood products	-3438.25								-3438.25		
H. Other	NA	NA	NA						NA		
5. Waste	NE,NO,IE	1606.01	116.86						1722.87	0	1 723
A. Solid waste disposal	NO	1370.66							1370.66		
B. Biological treatment of solid waste		67.84	41.39						109.24		
C. Incineration and open burning of waste	NE,NO,IE	NE,NO,IE	NE,NO,IE						NE,NO,IE		
D. Waste water treatment and discharge		167.50	75.47						242.97		
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	3644.92	2.67	28.41						3676.00		
Aviation	2557.95	0.35	20.83						2579.12		
Navigation	1086.97	2.32	7.58						1096.87		
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass	42330.01								42330.01		
CO₂ captured	124.63								124.63		
Long-term storage of C in waste disposal sites	54596.96								54596.96		
Indirect N₂O			168.31								
Indirect CO₂⁽³⁾	52.19										
Total CO₂ equivalent emissions without land use, land-use change and forestry									52729.66	23 247	29 246
Total CO₂ equivalent emissions with land use, land-use change and forestry									35323.66	23 247	29 298
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									52781.85	23 247	29 298
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									35375.85		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

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 of greenhouse gases in 2019 corresponded with 52.8 million tonnes of carbon dioxide (CO₂ eq.). Emissions have fallen by 26 per cent from the comparison year 1990 and by 38 per cent from 2003, when emissions were at their highest during the 1990 to 2019 time series. Compared with the previous year, emissions decreased by six per cent. The fall in emissions was most influenced by the decreased use of coal and peat. Emissions not included in the EU Emissions Trading System fell by two per cent but exceeded the annual emission allocations set by the EU by 0.2 million tonnes of CO₂ equivalent. In the instant preliminary data, the emissions and removals of the latest year are produced at a less detailed level than data for previous years.

According to the instant preliminary data, total emissions (excl. LULUCF) decreased by six per cent in 2019 (3.6 million tonnes of CO₂ eq.) compared to the previous year. In the energy sector, emissions fell by eight per cent (3.3 tonnes of CO₂ eq.) and the emissions from industrial processes and product use by five per cent (0.3 million tonnes of CO₂ equivalent). In the energy sector, the fall in emissions was most affected by the decreased consumption of coal and peat. Emissions from agriculture grew by one per cent (0.1 million tonnes of CO₂ eq.) and emissions in the waste sector fell by five per cent (0.1 million tonnes of CO₂ eq.) from 2018 to 2019. According to the instant preliminary data, the net sink i.e. the sum of emissions and removals of the land use, land-use change and forestry (LULUCF) sector was -17.4 million tonnes of CO₂ eq. in 2019, or 70 per cent higher than in the year before. The emissions and removals of this sector are usually not included in total emissions.

Emissions not included in the EU ETS are calculated as the difference between the total emissions and verified emissions in the EU ETS, excluding CO₂ emissions from domestic civil aviation as they are estimated in the inventory. The data on the verified emissions in the EU ETS are published by the Energy Authority. Annual emission allocations for the years 2013 to 2020 have been defined in the EU's Effort Sharing Decision for emissions not included in the ETS. Although emissions have decreased in 2018 and 2019 compared to previous years, the target path is exceeded in these years as well as in 2016. However, these could be compensated for

GHG Inventory, approximated inventory, instant preliminary data

http://tilastokeskus.fi/til/khki/2019/khki_2019_2020-05-28_tie_001_en.html

Energy Statistics, preliminary data

http://tilastokeskus.fi/til/ehk/2019/04/ehk_2019_04_2020-04-17_tie_001_en.html

Energy authority, EU Emissions trading Scheme, The data on the verified emissions of the emissions trading sector in Finland in 2019, in Finnish only

https://energiavirasto.fi/tiedote/-/asset_publisher/suomen-paastokaappasektorin-laitosten-paastot-pienenivat-3-0-miljoonaa-tonnia-vuonna-2019

France (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year PROXY 2019
Submission July 2020
Country France (KP)
Geographical scope⁽⁶⁾ perimeter of FR

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	298 193.58	56 895.49	43 267.90	15 490.85	679.84	409.45	-	12.25	414949		
1. Energy	302 445.25	2 499.59	3 769.49						308714	73 711	235 003
A. Fuel combustion (sectoral approach)	299 440.92	1 402.59	3 755.56						304599	70 986	233 613
1. Energy industries	40 791.73	42.74	275.91						41110	30 785	10 325
2. Manufacturing industries and construction	49 749.81	127.88	582.86						50461	39 495	10 966
3. Transport	130 439.35	149.11	1 499.98						132088	442	131 647
4. Other sectors	78 460.04	1 082.86	1 396.81						80940	265	80 675
5. Other	-	-	-						0	0	0
B. Fugitive emissions from fuels	3 004.33	1 097.00	13.94						4115	2 725	1 391
1. Solid fuels	-	17.62	-						0	18	0
2. Oil and natural gas	3 004.33	1 079.38	13.94						4098	2 725	1 373
C. CO ₂ transport and storage	-	-	-						0	0	0
2. Industrial processes and product use	22 359.34	48.17	1 090.30	15 490.85	679.84	409.45	-	12.25	40090	20 593	19 497
A. Mineral industry	9 887.23	-	-						9887	9 473	414
B. Chemical industry	6 508.63	38.24	954.77	154.10	3.10	-	-	-	7659	6 591	1 068
C. Metal industry	4 291.31	9.72	-	-	64.69	57.46	-	-	4423	4 485	-62
D. Non-energy products from fuels and solvent use	1 196.92	0.20	2.61						1200	37	1 162
E. Electronic Industry	-	-	-	8.25	80.66	3.54	-	12.25	105	0	105
F. Product uses as ODS substitutes	-	-	-	15 327.83	-	-	-	-	15328	0	15 328
G. Other product manufacture and use	475.20	-	132.92	0.66	531.38	348.46	-	-	1489	7	1 482
H. Other	0.04	-	-	-	-	-	-	-	0	0	0
3. Agriculture	2 018.59	38 135.86	34 619.60						74774		
A. Enteric fermentation	-	34 200.56	-						34201		
B. Manure management	-	3 826.36	2 501.46						6328		
C. Rice cultivation	-	63.08	-						63		
D. Agricultural soils	-	-	32 103.97						32104		
E. Prescribed burning of savannas	-	-	-						0		
F. Field burning of agricultural residues	-	45.86	14.17						60		
G. Liming	731.54	-	-						732		
H. Urea application	1 287.05	-	-						1287		
I. Other carbon-containing fertilizers	-	-	-						0		
J. Other	-	-	-						0		
4. Land use, land-use change and forestry⁽¹⁾	- 30 043.64	1 211.48	3 127.33						-25705		
A. Forest land	- 50 526.08	638.77	400.65						-49487		
B. Cropland	- 17 655.22	115.97	1 856.10						19627		
C. Grassland	- 7 757.96	168.33	109.30						-7480		
D. Wetlands	- 510.70	9.34	0.77						521		
E. Settlements	10 936.11	60.34	760.52						11757		
F. Other land	-	-	-						0		
G. Harvested wood products	- 913.99	-	-						-914		
H. Other	52.36	218.73	-						271		
5. Waste	1 414.04	15 000.41	661.18						17076		
A. Solid waste disposal	-	11 655.72	-						11656		
B. Biological treatment of solid waste	-	1 059.63	196.93						1257		
C. Incineration and open burning of waste	1 414.04	24.57	65.95						1505		
D. Waste water treatment and discharge	-	2 260.49	398.30						2659		
E. Other	-	-	-						0		
6. Other (as specified in summary I.A)	-	-	-						0	0	0
Memo items:⁽²⁾											
International bunkers	24116.15	17.07	196.43						24330		
Aviation	17825.00	1.96	148.39						17975		
Navigation	6291.16	15.11	48.04						6354		
Multilateral operations	1.28	NE	NE						1		
CO ₂ emissions from biomass	63182.83								63183		
CO ₂ captured	NO,NE,NA								NO,NE,NA		
Long-term storage of C in waste disposal sites	NE								NE		
Indirect N ₂ O			NO,NE								
Indirect CO ₂ ⁽³⁾	NO,IE,NA										
Total CO₂ equivalent emissions without land use, land-use change and forestry									440654	94 304	346 350
Total CO₂ equivalent emissions with land use, land-use change and forestry									414949		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

(1) For carbon dioxide (CO₂) 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 I.A.

(3) In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect CO₂ the national totals shall be provided with and without indirect CO₂.

(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 2C the ETS emission is slightly higher than the national inventory. In fact it should be 100% ETS. It is due to the fact that ETS plant data 2019 are available after the estimation of the proxy GHG inventory 2019 (which is not based on bottom-up approach from ETS 2019 data, but based on statistics indicator from steel production, but no indicator for emissions from aluminium production).

Greece (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Greece

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾									82 170		
1. Energy									61 107		
A. Fuel combustion (sectoral approach)									60 267		
1. Energy industries	32 142.29	10.29	97.14						32 250	31 803	447
2. Manufacturing industries and construction	4 656.71	6.67	60.74						4 724	3 581	1 143
3. Transport	17 000.00	72.00	250.00						17 322		17 322
4. Other sectors	5 500.00	240.00	80.00						5 820		5 820
5. Other	150.00	0.02	1.20						151		151
B. Fugitive emissions from fuels									840		
1. Solid fuels	NO	700	NA,NO						700		700
2. Oil and natural gas and other emissions from energy production	10	130	0						140		140
C. CO ₂ transport and storage	NO										
2. Industrial processes and product use									11 485		
A. Mineral industry	3 869								3 869	3 855	14
B. Chemical industry	205		21						226	226	
C. Metal industry	1 084	0	NO		104 926 393				1 190	1 011	179
D. Non-energy products from fuels and solvent use	30	NA,NO	NA,NO						30		30
E. Electronic Industry				NO	NO	NO	NO	NO	NO		
F. Product uses as ODS substitutes				5900	40				5 940		5 940
G. Other product manufacture and use	85	NA	140		NO	5			230		230
H. Other	NA	NA	NA								
3. Agriculture									7 815		
A. Enteric fermentation		3 600							3 600		3 600
B. Manure management		630	290						920		920
C. Rice cultivation		170							170		170
D. Agricultural soils		NE	3 050						3 050		3 050
E. Prescribed burning of savannahs		NO	NO								
F. Field burning of agricultural residues		30	10						40		40
G. Liming	NO										
H. Urea application	35								35		35
I. Other carbon-containing fertilizers	NO										
J. Other											
4. Land use, land-use change and forestry⁽¹⁾									-3 014		
A. Forest land	-2120.00	4.00	0.35						-2 116		
B. Cropland	300.00	NO	1.20						301		
C. Grassland	-1500.00	15.50	1.30						-1 483		
D. Wetlands	0.01	NO	0.00						0		
E. Settlements	130.00	NO	7.00						137		
F. Other land	80.00	NO	6.20						86		
G. Harvested wood products	60.00								60		
H. Other	NO		NO								
5. Waste									4 778		
A. Solid waste disposal	NO,NA	3 300							3 300		3 300
B. Biological treatment of solid waste		55	17						72		72
C. Incineration and open burning of waste	5	0	1						6		6
D. Waste water treatment and discharge		1 100	300						1 400		1 400
E. Other	NO	NO	NO								
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO			
Memo items:⁽²⁾											
International bunkers	11 100.00	15.70	205.00						11 320.70		
Aviation	3 900.00	0.70	35.00						3 935.70		
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 ₂ O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									85 184.92	40 475.98	44 708.95
Total CO₂ equivalent emissions with land use, land-use change and forestry									82 170.48		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry											
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry											

(1) For carbon dioxide (CO₂) 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 emissions positive (+).

(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 CO₂ the national totals shall be provided with and without indirect CO₂.

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.

Croatia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Croatia

Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	18 127.41	3 993.39	1 739.34	499.04	NA,NO	5.33	NA,NO	NA,NO	24 364.52		
1. Energy	16 042.92	546.82	214.20						16 803.94	5 548.58	11 255.36
A. Fuel combustion (sectoral approach)	15 756.27	364.07	214.00						16 334.34	5 548.58	10 785.77
1. Energy industries	4 155.63	8.34	23.63						4 187.60	3 739.51	448.09
2. Manufacturing industries and construction	2 121.02	3.25	5.77						2 130.04	1 809.06	320.98
3. Transport	6 681.72	26.46	64.64						6 772.81	NO	6 772.81
4. Other sectors	2 797.90	326.02	119.96						3 243.89	NO	3 243.89
5. Other	NO	NO	NO						NO	NO	NO
B. Fugitive emissions from fuels	286.65	182.75	0.19						469.59	NO	469.59
1. Solid fuels	NO	NO	NO						NO	NO	NO
2. Oil and natural gas	286.65	182.75	0.19						469.59	NO	469.59
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	2 002.65	NA	127.85	499.04	NA,NO	5.33	NA,NO	NA,NO	2 634.87	1 966.15	668.72
A. Mineral industry	1 331.27								1 331.27	1 324.88	6.38
B. Chemical industry	583.93	NA	50.10	NA	NA	NA	NA	NA	634.03	634.03	NO
C. Metal industry	7.24	NA	NA	NA	NA	NA	NA	NA	7.24	7.24	NO
D. Non-energy products from fuels and solvent use	80.21	NA	NA						80.21	NO	80.21
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				499.04	NO	NA	NA	NA	499.04	NO	499.04
G. Other product manufacture and use	NA	NA	77.75	NA	NA	5.33	NA	NA	83.08	NO	83.08
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NO	NA
3. Agriculture	81.85	1 396.33	1 303.99						2 782.17		
A. Enteric fermentation		993.04							993.04		
B. Manure management		403.29	135.56						538.86		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA	1 168.43						1 168.43		
E. Prescribed burning of savannas		NA	NA						NA		
F. Field burning of agricultural residues		NO	NO						NO		
G. Liming	7.23								7.23		
H. Urea application	74.62								74.62		
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	2 050.24	93.30						2 143.54		
A. Solid waste disposal	NA	1 837.75							1 837.75		
B. Biological treatment of solid waste		5.26	3.76						9.02		
C. Incineration and open burning of waste	NO	NA	NA						NO		
D. Waste water treatment and discharge		207.22	89.54						296.76		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	624.92	0.25	5.12						630.29		
Aviation	559.65	0.10	4.60						564.35		
Navigation	65.27	0.15	0.52						65.94		
Multilateral operations	C	C	C						C		
CO ₂ emissions from biomass	6 053.22								6 053.22		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	4 597.68								4 597.68		
Indirect N ₂ O			NO,NA								
Indirect CO ₂ ⁽³⁾	NO,NA										
Total CO₂ equivalent emissions without land use, land-use change and forestry									24 364.52	7 514.73	16 849.79
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 emissions positive (+).

⁽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 CO₂ the national totals shall be provided with and without indirect CO₂.

⁽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

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

1A1 - 90% of total CO2 emissions is from ETS, according to 2018. It is assumed that the distribution stayed the same in 2019. For CH4 and N2O emissions is assumed that ratio CH4/CO2 and N2O/CO2 in 2019 is the same as for 2018.

1A2 - 106.1% of total CO2 emissions is from ETS, according to data for 2018. It is assumed that the distribution stayed the same in 2019. For CH4 and N2O emissions is assumed that ratio CH4/CO2 and N2O/CO2 in 2019 is the same as for 2018

1A3 - Transport, 1A4. Other Sectors, 1B2. Oil and Natural Gas all GHG were extrapolated based on emissions from 2015-2018

1B2 - all GHG are extrapolated based on emissions from 2015-2018

2. Industrial processes and product use

2.A - ETS: CO2 emissions from 2.A.1; 2.A.2; 2.A.3; 2.A.4.a and 2.A.4.d; non-ETS: CO2 emission from 2.A.4.b. Verified ETS emissions for 2.A.1; 2.A.2; 2.A.3; 2.A.4.a and 2.A.4.d are provided

2.B.1 - ETS: natural gas consumption as fuel and feedstock in ammonia production is included. Verified ETS CO2 emission for 2.B.1 is provided by Ministry of Environment and Energy.

2.B.2 - ETS: The methodology used to determine N2O emission is based on the measurement. Catalytic decomposition is implemented as a measure for N2O emission reduction in nitric acid

2.C.1 - ETS: Verified CO2 emission from steel production is included. Data are provided by Ministry of Environment and Energy.

2.D.1; 2.D.2; 2.D.3 - non-ETS: CO2 emission is assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of recent data.

2.E - Activities do not exist within a country.

2.F - non-ETS: HFC emissions are assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of recent data. PFC emissions do not exist within a country.

2.G.1 - non-ETS: SF6 emission is assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of recent data.

2.G.3 - non-ETS: N2O emission is assessed by extrapolation, according to emissions trend from 2015 to 2018, due to the lack of recent data.

2.H.1; 2.H.2; 2.H.3 - non-ETS: Only information on CO2 emission of non-biogenic origin should be reported.

3. Agriculture

3.A-3.H. linear extrapolation is based on trend from 2014 to 2018

5. Waste

5.A.1; 5.A.2 CH4 emissions are assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of the information.

5.B CH4 and N2O emissions are assessed by extrapolation, according to emissions trend from 2016 to 2018, due to the lack of the information.

5.C.1 CO2 emissions are assessed according to data for 2018 as NO, due to the lack of the information. There was no incineration of clinical waste without energy recovery in 2018.

5.D.1 CH4 emission is assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of the information.

5.D.1 N2O emission is assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of the information.

5.D.2 CH4 emission is assessed by extrapolation, according to emissions trend from 2014 to 2018, due to the lack of the information.

Hungary (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)

Year 2019
Submission
Country HU
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions) ⁽¹⁾	NE	NE	NE	NE	NE	NE	NE	NE	NE		
1. Energy	43887.59	1212.35	332.17						45432.12	14 597.49	30 834.62
A. Fuel combustion (sectoral approach)	43739.06	549.25	331.86						44620.18	14 567.23	30 052.95
1. Energy industries	12466.81	24.34	56.39						12547.54	11 884.63	662.91
2. Manufacturing industries and construction	5450.59	12.95	30.28						5493.82	2 511.39	2 982.43
3. Transport	14145.66	23.79	152.50						14321.95	161.71	14 160.24
4. Other sectors	11647.66	488.17	92.46						12228.29	9.50	12 218.79
5. Other	28.34	0.00	0.23						28.58	0.00	28.58
B. Fugitive emissions from fuels	148.53	663.09	0.31						811.93	30.27	781.67
1. Solid fuels	9.02	30.53	0.00						39.55	9.02	30.53
2. Oil and natural gas	139.51	632.57	0.31						772.39	21.25	751.14
C. CO ₂ transport and storage									NO	NO	NO
2. Industrial processes and product use	5271.45	48.00	209.56	1399.16	1.09	101.06	NO	NO	7030.32	4 933.01	2 097.30
A. Mineral industry	1464.15								1464.15	1 460.09	4.06
B. Chemical industry	2492.92	43.23	32.11	NO	NO	NO	NO	NO	2568.26	2 263.35	304.91
C. Metal industry	1209.57	4.76	NO	NO	NO	NO	NO	NO	1214.33	1 209.57	4.76
D. Non-energy products from fuels and solvent use	104.81	NO,NA	NO,NA						104.81	0.00	104.81
E. Electronic Industry				NO	NO	NO	NO	NO	NO	0.00	0.00
F. Product uses as ODS substitutes				1399.16	1.09	NO	NO	NO	1400.25	0.00	1 400.25
G. Other product manufacture and use	NO	NO	177.45	NO	NO	101.06	NO	NO	278.51	0.00	278.51
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	218.26	2742.43	4166.86						7127.56		
A. Enteric fermentation		2069.56							2069.56		
B. Manure management		654.76	457.21						1111.98		
C. Rice cultivation		17.87							17.87		
D. Agricultural soils		NA	3709.58						3709.58		
E. Prescribed burning of savannas		NO	NO						0.00		
F. Field burning of agricultural residues		0.23	0.07						0.31		
G. Liming	9.62								9.62		
H. Urea application	115.94								115.94		
I. Other carbon-containing fertilizers	92.70								92.70		
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,NA	NE						NE		
F. Other land	NE	NO,NA	NE						NE		
G. Harvested wood products	NE								NE		
H. Other	NA	NA	NA						NA		
5. Waste	45.63	3259.67	116.18						3421.48		
A. Solid waste disposal	NO,NA	2901.07							2901.07		
B. Biological treatment of solid waste		111.22	39.83						151.05		
C. Incineration and open burning of waste	45.63	0.23	0.93						46.79		
D. Waste water treatment and discharge		247.16	75.41						322.57		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	853.13	0.15	6.99						860.27		
Aviation	853.13	0.15	6.99						860.27		
Navigation	NO,NE	NO,NE	NO,NE						NO,NE		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	10640.97								10640.97		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	NE								NE		
Indirect N ₂ O			NO,NE								
Indirect CO ₂ ⁽³⁾	NO,NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									63011.47	19 530.51	43 480.96
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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.

Preliminary data indicate no significant change of total emissions for 2019, only a slight decrease of 0.3% is expected.

ETS emissions decreased by 2.6%.

ENERGY (-0.2%)

The overall change in the energy sector was not significant.

However, emissions from the transport sector grew further by around 3%. At the same time, emissions from power and heat generation decreased by 4% due to significantly less coal based but increased natural gas based power production.

IPPU (-1.1%)

7.5% increase is expected in the emissions from mineral industry. Cement production has been continuously increasing since 2013, the trend is expected to continue.

In contrast, pig iron and steel production of the BOF steel producing company decreased by about 14%. 13.4% decrease is expected in the emissions of this sector.

Increased emission for F-gases (2.8%) is attributed to subcategory 2F1 due to the increasing trend of disposal emissions.

No significant changes are observed in other categories for F-gases.

AGRICULTURE (-0.2%)

Agricultural emissions remained at the last year's level.

Increasing emissions from cattle husbandry and crop residues offset the slightly declining fertilizer use.

WASTE (-0.6%)

The decreasing trend is expected to continue.

Ireland (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2021
Country Ireland

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	37103.55	13900.92	6679.09	956.30	63.05	40.28	NO	1.38	58744.57		
1. Energy	34426.59	239.99	377.17						35043.75		
A. Fuel combustion (sectoral approach)	34426.32	163.04	377.17						34966.53		
1. Energy industries	9217.97	10.83	139.20						9367.99		
2. Manufacturing industries and construction	4543.12	8.06	13.44						4564.63		
3. Transport	12019.84	11.32	129.26						12160.42		
4. Other sectors	8645.39	132.83	95.27						8873.49		
5. Other	IE	IE	IE						IE		
B. Fugitive emissions from fuels	0.28	76.95	0.00						77.22		
1. Solid fuels	NO	18.35	NO						18.35		
2. Oil and natural gas and other emissions from energy production	0.28	58.60	0.00						58.88		
C. CO ₂ transport and storage	NO								NO		
2. Industrial processes and product use	2217.41	NO	44.00	956.30	63.05	40.28	NO	1.38	3322.42	2057.67	1264.75
A. Mineral industry	2057.67								2057.67	2057.67	0.00
B. Chemical industry	NO	NO	NO						NO		
C. Metal industry	NO	NO							NO		
D. Non-energy products from fuels and solvent use	159.74	NO	NO						159.74		159.74
E. Electronic Industry				956.30	63.05	23.10		1.38	1043.83		1043.83
F. Product uses as ODS substitutes									0.00		0.00
G. Other product manufacture and use	NO	NO	44.00	NO	NO	17.18	NO	NO	61.18		61.18
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO		
3. Agriculture	436.07	12943.25	6149.50						19528.83		19528.83
A. Enteric fermentation		11518.73							11518.73		11518.73
B. Manure management		1424.52	534.97						1959.50		1959.50
C. Rice cultivation		NO							NO		
D. Agricultural soils		NE	5614.53						5614.53		5614.53
E. Prescribed burning of savannahs		NO	NO						NO		
F. Field burning of agricultural residues		NO	NO						NO		
G. Liming	344.09								344.09		344.09
H. Urea application	91.98								91.98		91.98
I. Other carbon-containing fertilizers	NO								NO		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾									0.00		
A. Forest land									0.00		
B. Cropland									0.00		
C. Grassland									0.00		
D. Wetlands									0.00		
E. Settlements									0.00		
F. Other land									0.00		
G. Harvested wood products									0.00		
H. Other									0.00		
5. Waste	23.48	717.67	108.42						849.57		849.57
A. Solid waste disposal	NO	655.62							655.62		655.62
B. Biological treatment of solid waste		15.36	10.98						26.34		26.34
C. Incineration and open burning of waste	23.48	0.17	0.25						23.89		23.89
D. Waste water treatment and discharge		46.53	97.19						143.72		143.72
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	3 734.15	1.58	30.25						3 765.98		
Aviation	3 317.31	0.59	26.87						3 344.78		
Navigation	416.83	0.99	3.38						421.21		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	2 584.46								2 584.46		
CO ₂ captured	NO,IE								NO,IE		
Long-term storage of C in waste disposal sites	NE								NE		
Indirect N ₂ O			NO,NE								
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									58 744.57	14 168.77	44 575.80
Total CO₂ equivalent emissions with land use, land-use change and forestry									58 744.57		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									58 744.57		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									58 744.57		

(1) For carbon dioxide (CO₂) 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

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

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.

Power Generation emissions are down 11.3%; 70% reduction in coal combustion, 8% reduction in peat, 4% increase in gas, 11% increase in wind renewables

ETS emissions decreased by 8.7% and non-ETS emissions decreased by 1.9%

Transport: 0.5% decrease; 1.0% increase in road diesel, 5.8% reduction in gasoline

IPPU: 1.8% decrease in emissions from mineral industry

Agriculture down 2.1%: Dairy cow population increase of 2.8%. 10.1% decrease in fertiliser nitrogen use and 25% decrease in liming

Residential decreased by 5.3%, Public and Commercial services show increases of 1.3% and 1.1% respectively. In 2019 there were 3.8% fewer degree days than 2018

Italy (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Italy
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	302397.03	41718.01	18137.80	16817.19	1624.01	402.44	20.92	22.13	381139.55		
1. Energy	321995.71	7424.87	4521.35						333941.94	126 637	207 305
A. Fuel combustion (sectoral approach)	319700.44	2930.31	4511.87						327142.62	122 635	204 508
1. Energy industries	92338.50	121.22	367.52						92827.24	92 003	824
2. Manufacturing industries and construction	47704.53	264.26	732.40						48701.19	29 051	19 650
3. Transport	102317.52	200.40	959.73						103477.65	775	102 703
4. Other sectors	76999.12	2343.37	2442.74						81785.24	805	80 980
5. Other	340.76	1.06	9.47						351.30	0	351
B. Fugitive emissions from fuels	2295.27	4494.56	9.48						6799.32	4 003	2 797
1. Solid fuels	0.00	34.28	0.00						34.28	0	34
2. Oil and natural gas	2295.27	4460.28	9.48						6765.04	4 003	2 762
C. CO ₂ transport and storage	0.00								0.00	0	0
2. Industrial processes and product use	14940.84	41.52	675.44	16817.19	1624.01	402.44	20.92	22.13	34544.50	14 305	20 240
A. Mineral industry	10944.23								10944.23	10 673	271
B. Chemical industry	1369.60	4.19	120.75	0.00	1478.00	0.00	0.00	NA	2972.53	2 130	842
C. Metal industry	1568.62	37.34	0.00	10.01	0.00	0.00	0.00	0.00	1615.96	1 429	187
D. Non-energy products from fuels and solvent use	1058.39	0.00	0.00						1058.39	72	986
E. Electronic industry				6.90	146.01	50.05	20.92	22.13	246.02	0	246
F. Product uses as ODS substitutes				16800.28	0.00	0.00	0.00	NA	16800.28	0	16 800
G. Other product manufacture and use	0.00	0.00	554.69	0.00	0.00	352.39	0.00	NA	907.07	0	907
H. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
3. Agriculture	420.71	19329.80	10522.36						30272.86		
A. Enteric fermentation		14254.71							14254.71		
B. Manure management		3471.31	2185.80						5657.11		
C. Rice cultivation		1588.93							1588.93		
D. Agricultural soils		0.00	8332.74						8332.74		
E. Prescribed burning of savannas			0.00						0.00		
F. Field burning of agricultural residues		14.84	3.83						18.67		
G. Liming	15.45								15.45		
H. Urea application	405.26								405.26		
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⁾	-35042.28	86.55	473.00						-34482.73		
A. Forest land	-34726.55	52.15	0.30						-34674.11		
B. Cropland	2390.88	0.60	62.58						2454.05		
C. Grassland	-7572.92	33.81	33.90						-7505.22		
D. Wetlands	0.00	0.00	0.00						0.00		
E. Settlements	4931.22	0.00	362.24						5293.46		
F. Other land	0.00	0.00	0.00						0.00		
G. Harvested wood products	-64.90								-64.90		
H. Other	0.00	0.00	0.00						0.00		
5. Waste	82.05	14835.27	1945.65						16862.97		
A. Solid waste disposal	0.00	12220.81							12220.81		
B. Biological treatment of solid waste		135.15	582.66						717.81		
C. Incineration and open burning of waste	82.05	54.39	18.85						155.29		
D. Waste water treatment and discharge		2424.92	1344.14						3769.06		
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	0
Memo items:⁽²⁾											
International bunkers									17651.56		
Aviation									11734.93		
Navigation									5916.63		
Multilateral operations									0.00		
CO₂ emissions from biomass									45506.37		
CO₂ captured									0.00		
Long-term storage of C in waste disposal sites									0.00		
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									415622.27	140 942	274 680
Total CO₂ equivalent emissions with land use, land-use change and forestry									381139.55		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									415622.27		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									381139.55		

(1) For carbon dioxide (CO₂) 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 (-)

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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 national emissions without LULUCF are expected to decrease in 2019 with respect 2018 (-2.8%) as a consequence of reduction in the energy sector; in particular emissions from energy production are reduced because of the starting of the phase out of coal fuelled plants, as well as an increase of energy production from renewable sources, especially eolic and fotovoltaic, and emissions reduction from domestic heating and road transportation.

Lithuania (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year
Submission
Country
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	10 291.75	2 935.38	3 159.58	570.57	NO	5.11	NO	NO	16 962.39		
1. Energy	11 241.93	493.26	187.40						11 922.58	3 077	8 844
A. Fuel combustion (sectoral approach)	11 010.33	202.75	187.40						11 400.47	2 846	8 553
1. Energy industries	2 223.57	22.71	36.28						2 282.57	2 160	123
2. Manufacturing industries and construction	1 288.71	5.07	13.80						1 307.58	678	630
3. Transport	6 212.14	19.64	95.93						6 327.71	4	6 322
4. Other sectors	1 265.62	155.32	41.22						1 462.16	4	1 458
5. Other	20.28	0.00	0.17						20.45	NA	20
B. Fugitive emissions from fuels	231.60	290.51	NO						522.11	232	291
1. Solid fuels	NO	NO	NO						NO	NA	NO
2. Oil and natural gas	231.60	290.51	NO						522.11	232	291
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	2 466.09	NO	183.93	570.57	NO	5.11	NO	NO	3 225.70	2 779	446
A. Mineral industry	600.88								600.88	600	1
B. Chemical industry	1 802.92	NO	179.33	NO	NO	NO	NO	NO	1 982.25	2 179	-197
C. Metal industry	1.51	NO	NO	NO	NO	NO	NO	NO	1.51	NO	2
D. Non-energy products from fuels and solvent use	60.78	NO	NO						60.78	NO	61
E. Electronic Industry				NO	NO	4.46	NO	NO	4.46	NO	4
F. Product uses as ODS substitutes				570.57	NO	NO	NO	NO	570.57	NO	571
G. Other product manufacture and use	NO	NO	4.60	NO	NO	0.65	NO	NO	5.25	NO	5
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	28.53	1665.21	2529.70						4 223.43		
A. Enteric fermentation		1451.82							1 451.82		
B. Manure management		213.38	169.87						383.26		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA	2359.83						2 359.83		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		NO	NO						NO		
G. Liming	12.42								12.42		
H. Urea application	16.11								16.11		
I. Other carbon-containing fertilizers	NE								NE		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	-3 445.89	0.61	188.46						-3 256.82		
A. Forest land	-5 194.88	0.18	29.54						-5 165.16		
B. Cropland	941.35	0.00	51.61						992.96		
C. Grassland	-851.09	0.43	0.66						-850.00		
D. Wetlands	817.07	NO,NE	0.00						817.07		
E. Settlements	1 161.39	NO	72.71						1 234.09		
F. Other land	614.77	NO,NE	33.94						648.71		
G. Harvested wood products	-934.50								-934.50		
H. Other	NA	NA	NA						NA		
5. Waste	1.10	776.31	70.09						847.50		
A. Solid waste disposal	NO,NA	590.16							590.16		
B. Biological treatment of solid waste		65.01	27.54						92.54		
C. Incineration and open burning of waste	1.10	0.00	0.03						1.13		
D. Waste water treatment and discharge		121.13	42.52						163.66		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Memo items:⁽²⁾											
International bunkers	995.20	1.48	7.98						1 004.66		
Aviation	379.09	0.07	3.15						382.31		
Navigation	616.11	1.42	4.83						622.35		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	5 708.10								5 708.10		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	3 916.44								3 916.44		
Indirect N ₂ O			22.49								
Indirect CO ₂ ⁽³⁾	NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									20 219.21	5 856	14 361
Total CO₂ equivalent emissions with land use, land-use change and forestry									16 962.39		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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	<p>Although GHG emissions increased in transport and manufacturing industries subsectors, they were partly compensated by decreases in energy industries and residential subsectors in 2019. This happened mainly because Vilnius thermal power plant reduced its fossil fuel consumption, the only oil refinery reduced residual fuel oil consumption, and a reduction of coal use is observed in residential sector. An increase of GHG emissions in manufacturing industries was influenced by increased activity level of cement production (where coal is consumed), and the increase in transport was observed due to the increased diesel oil consumption in road transport.</p>
2. IPPU	<p>Emissions from IPPU sector in 2019 have increased by 2% compared to 2018 due to increase of production in mineral and chemical industry.</p>
3. Agriculture	<p>Emissions from agriculture sector in 2019 have decreased by 1% compared to 2018. 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. A slight increase of agriculture soils emissions is related mainly to the increase of inorganic N fertilizer consumption and increase of crop harvest and area harvested, however despite that, overall emissions from agriculture has decreased.</p>
4. LULUCF	<p>Reduced GHG removals in LULUCF sector are mainly determined by reduced 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. In addition to this, there were larger areas of forest land converted to infrastructure objects and for military purposes (other land category), therefore emissions from settlements and other land categories increased significantly.</p>
5. Waste	<p>Emissions from waste sector in 2019 have decreased by 2% compared to 2018. The decrease is mainly due to the reduction of disposed of waste in landfills and the increase in the number of population connected to centralized sewerage networks.</p>

Luxembourg (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Luxembourg
Geographical scope⁽⁴⁾ Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	9739.03	590.44	316.25	67.55	NA,NO	10.56	NA,NO	NA,NO	10723.84		
1. Energy	9150.30	54.01	85.92						9290.23	931.18	8359.05
A. Fuel combustion (sectoral approach)	9150.26	23.24	85.92						9259.42	931.18	8328.24
1. Energy industries	224.10	4.47	7.08						235.64	48.10	187.54
2. Manufacturing industries and construction	1164.95	2.17	9.27						1176.39	883.08	293.31
3. Transport	6114.33	3.58	64.89						6182.79	NA	6182.79
4. Other sectors	1646.78	13.02	4.67						1664.47	NA	1664.47
5. Other	0.11	0.00	0.00						0.12	NA	0.12
B. Fugitive emissions from fuels	0.04	30.77	NA,NO						30.81	NA	30.81
1. Solid fuels	NO	NO	NO						NO	NO	NO
2. Oil and natural gas	0.04	30.77	NA,NO						30.81	NA	30.81
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	578.35	NA,NO	4.72	67.55	NA,NO	10.56	NA,NO	NA,NO	661.17	565.06	96.11
A. Mineral industry	432.47								432.47	459.08	-26.61
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal industry	114.38	NA	NA	NA	NA	NA	NA	NA	114.38	105.98	8.40
D. Non-energy products from fuels and solvent use	31.50	NA	NA						31.50	NA	31.50
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				63.00	NO	NO	NO	NO	63.00	NA	63.00
G. Other product manufacture and use	NO	NO	4.72	4.56	NO	10.56	NO	NO	19.83	NA	19.83
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	10.38	462.66	216.09						689.13	NA	689.13
A. Enteric fermentation		401.63							401.63	NA	401.63
B. Manure management		61.03	26.79						87.82	NA	87.82
C. Rice cultivation		NO							NO	NO	NO
D. Agricultural soils		NA	189.30						189.30	NA	189.30
E. Prescribed burning of savannas		NO	NO						NO	NO	NO
F. Field burning of agricultural residues		NO	NO						NO	NO	NO
G. Liming	10.38								10.38	NA	10.38
H. Urea application	NO								NO	NO	NO
I. Other carbon-containing fertilizers	NO								NO	NO	NO
J. Other	NO	NO	NO						NO	NO	NO
4. Land use, land-use change and forestry⁽¹⁾	-252.64	NO	8.18						-244.46		
A. Forest land	-282.48	NO	NO						-282.48		
B. Cropland	31.25	NO	2.95						34.21		
C. Grassland	-40.75	NO	0.12						-40.63		
D. Wetlands	3.27	NO	0.33						3.60		
E. Settlements	51.58	NO	4.77						56.35		
F. Other land	0.10	NO	0.01						0.10		
G. Harvested wood products	-15.62	NO	NO						-15.62		
H. Other	NO	NO	NO						NO		
5. Waste	NA,NO	73.77	9.53						83.30	NA	83.30
A. Solid waste disposal	NA	48.66	NO						48.66	NA	48.66
B. Biological treatment of solid waste		22.37	5.29						27.66	NA	27.66
C. Incineration and open burning of waste	IE	IE	IE						IE	IE	IE
D. Waste water treatment and discharge		2.74	4.24						6.97	NA	6.97
E. Other	NO	NO	NO						NO	NO	NO
6. Other (as specified in summary 1.A)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Memo items:⁽²⁾											
International bunkers										NE	
Aviation										NE	
Navigation										NE	
Multilateral operations										NE	
CO₂ emissions from biomass										NE	
CO₂ captured										NO	
Long-term storage of C in waste disposal sites										NE	
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									10723.84	1496.24	9227.60
Total CO₂ equivalent emissions with land use, land-use change and forestry									10479.37		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

(1) For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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 2019, excl. LULUCF, are 1.68% higher than the inventory emissions for 2018. The key drivers for the changes in GHG emissions in 2019 compared to 2018 are:

- higher liquid fuel consumption in the road transportation sector (approx. + 154 Gg CO₂ eq or +2.56%) mostly driven by an increase in gasoline sold rather than diesel;
- an important increase in the use of biomass generating higher CH₄ & N₂O emissions in CRF categories 1A1a & 1A2f;
- a decrease in liquid and gaseous related emissions for the CRF category 1A4c.

There are other rather substantial changes between the two years, but on relatively small amounts of emissions (e.g. anaerobic digestion at biogas facilities CH₄ emissions (CRF 5B2) or swine related CH₄ & N₂O emissions).

Latvia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission V1
Country Latvia
Geographical scope⁽⁴⁾ Latvia

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	7629.92	1738.59	1892.34	248.16	NA,NO	10.25	NA,NO	NA,NO	11519.26		
1. Energy	6974.59	318.85	179.43						7472.88	1 905	5568.12
A. Fuel combustion (sectoral approach)	6974.58	198.74	179.43						7352.75	1 905	5448.00
1. Energy industries	1783.44	16.11	25.36						1824.91	1 534	291.00
2. Manufacturing industries and construction	628.54	15.10	36.58						680.22	342	337.96
3. Transport	3278.26	3.41	46.27						3327.94	NA	3327.94
4. Other sectors	1269.53	164.10	71.10						1504.73	29	1476.14
5. Other	14.81	0.03	0.12						14.96	NO	14.96
B. Fugitive emissions from fuels	0.01	120.11	NA,NO						120.12	NO	120.12
1. Solid fuels	NO	NO	NA,NO						NA,NO	NO,NA	NO,NA
2. Oil and natural gas	0.01	120.11	NO						120.12	NA	120.12
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	600.54	0.00	3.63	248.16	NA,NO	10.25	NA,NO	NA,NO	862.58	588.30	274.27
A. Mineral industry	556.60								556.60	588.30	NO
B. Chemical industry	NO	NO	NO	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NA,NO	NO,NA	NO,NA
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	43.94	NO,NA	NO,NA						43.94	NA	43.94
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				248.16	NO	NO	NO	NO	248.16	NA	248.16
G. Other product manufacture and use	NO	NO	3.63	NO	NO	10.25	NO	NO	13.88	NO	13.88
H. Other	NO,NA	NO,NA	NO,NA	NA	NA	NA	NA	NA	NA,NO	NO,NA	NO,NA
3. Agriculture	54.74	926.07	1661.41						2642.23	NA	2642.22875
A. Enteric fermentation		837.07							837.07	NA	837.070575
B. Manure management		89.00	77.68						166.68	NA	166.683231
C. Rice cultivation		NO							NO	NA	NO
D. Agricultural soils		NE	1583.73						1583.73	NA	1583.73014
E. Prescribed burning of savannas		NO	NO						NO	NA	NO
F. Field burning of agricultural residues		NO	NO						NO	NA	NO
G. Liming	44.63								44.63	NA	44.6343333
H. Urea application	10.11								10.11	NA	10.1104667
I. Other carbon-containing fertilizers	NE								NE	NA	NO
J. Other	NO	NO	NO						NO	NA	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	NE						NE		
H. Other	NE	NE	NE						NE		
5. Waste	0.04	493.66	47.88						541.58	NA	541.58
A. Solid waste disposal	NA,NO	393.35							393.35	NA	393.35
B. Biological treatment of solid waste		24.78	17.72						42.50	NA	42.50
C. Incineration and open burning of waste	0.04	NA,NO	0.00						0.04	NA	0.04
D. Waste water treatment and discharge		75.53	30.15						105.68	NA	105.68
E. Other	NO	NO	NO						NO	NA	NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	1401.55	1.42	100.31						1503.28		
Aviation	481.28	0.15	5.21						486.64		
Navigation	920.26	1.27	95.10						1016.64		
Multilateral operations	NA	NA	NA						NA		
CO ₂ emissions from biomass	7013.34								7013.34		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	NA								NA		
Indirect N ₂ O			NO,NE,NA								
Indirect CO ₂ ⁽³⁾	18.08										
Total CO₂ equivalent emissions without land use, land-use change and forestry									11519.26	2493.06	9026.20
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									11537.34		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

(1) For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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 2019 were estimated using available activity data from Central Statistical 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 2018 level. Compared to previous inventory (GHG inventory submission to UNFCCC on 11st of May 2020) Latvia's total GHG emissions excluding LULUCF, including indirect CO₂ have decreased by 1.6% in 2019. 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 5.7% (32 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 2019. Very minor differences occur also for glass production due to the same reason and rounding.

1A1 Energy Industries have decreased by 5.6% compared to 2018 due to decrease use of natural gas in sector (-5.8%) as well as use solid fossil fuels and peat have decrease. Liquid fossil fuel use and biomass have slightly increased in comparison with 2018.

In sector 1A2 Manufacturing Industries and Construction emissions have decreased by 10.8% in comparison with 2018. In 2019 use of all fuels have decreased with exception of peat and biomass where slight increase can be seen in comparison of 2018.

In 2019 emissions in sector 1A4 Other Sectors have decreased by 2.1% compared to 2018. In 2019 decrease in use of solid fossil fuels, peat, natural gas

Transport The estimated total GHG emissions of Transport sector in 2019 are approximately 0.8% lower than in 2018. If emissions in the road transport sector have increased by 0.7%, rail emissions have fallen by about 18% as fuel consumption has decreased by 18.3%. As a result, road transport emissions in 2019 represent around 95% of total emissions, while the share of the rail sector in total emissions has fallen to 4.6%.

IPPU Emissions from IPPU sector in 2019 are increased by 0.2% compared to 2018. The small increase is due to an increase in F-gases emissions. 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.

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 increased by 4.0% compared to 2018.

Solvents Activity data for the Solvent Use sector was not available in 2019. There is a stability in trends of CO₂ emissions from Solvent use sector in later 3 years either, therefore emissions in 2019 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 (+6.5%).

For N₂O from product use activity data wasn't available in 2019. 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 (-2.85%).

recorded – 3.2 million t, which is 1.5 times more than a year ago. The record-high harvested production was facilitated by both high yield and wider areas of cereals – cereal cropland covered 742.3 thousand ha, which is 51.4 thousand ha or 7.5 % more than year ago. Harvested production of grain was significantly influenced by the increase in share of winter cereal areas in the total cereal cropland – from 35.4 % in 2018 to 58.8 % in 2019.

In 2019, rape areas occupied 140.1 thousand ha, which is 16.5 thousand ha or 13.4 % more than a year ago and the widest rape area was recorded in the history of Latvian agriculture. Significant upturn in the harvested production of rape seeds was facilitated by the rise in share of winter rape (up to 83.1 %). In 2019, areas of potato plantations rose slightly – only by 0.1 thousand ha or 0.7 %, while harvested production of potatoes grew by 17.6 %.

Waste In 2019 GHG emissions from Waste sector decreased by 1.2% compare to previous year. There are no significant emissions changes comparing to previous submissions in waste disposal, incineration and biological treatment sectors. Activity data for these categories do not change significantly. Decrease of national population, decrease of industrial waste water and increase of quality of waste water treatment were reason for small decrease of emissions.

Malta (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year
Submission
Country
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	CO ₂ equivalent (Gg)	
										ETS	non-ETS
Total (net emissions)⁽¹⁾											
1. Energy	1553.92	2.68	7.39						1564.00	739.17	824.83
A. Fuel combustion (sectoral approach)	1553.92	2.68	7.39						1564.00	739.17	824.83
1. Energy industries	739.17	0.35	0.46						739.98	739.17	0.81
2. Manufacturing industries and construction	40.11	0.03	0.07						40.21		40.21
3. Transport	638.09	1.49	6.60						646.17		646.17
4. Other sectors	133.52	0.79	0.26						134.57		134.57
5. Other	3.04	0.01	0.01						3.06		3.06
B. Fugitive emissions from fuels	NO	NO	NO						NO		NO
1. Solid fuels	NO	NO	NO						NO		NO
2. Oil and natural gas	NO	NO	NO						NO		NO
C. CO ₂ transport and storage	NO								NO		NO
2. Industrial processes and product use	4.86	NO	0.92	323.00	0.00	0.30	NO	NO	329.08		329.08
A. Mineral industry	0.20								0.20		0.20
B. Chemical industry	0.03	NO	NO	NO	NO	NO	NO	NO	0.03		0.03
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
D. Non-energy products from fuels and solvent use	4.63	NO	NO						4.63		4.63
E. Electronic Industry				0.06	NO	NO	NO	NO	0.06		0.06
F. Product uses as ODS substitutes				322.94	NO	NO	NO	NO	322.94		322.94
G. Other product manufacture and use	NO	NO	0.92	NO	0.00	0.30	NO	NO	1.22		1.22
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
3. Agriculture	NO	46.01	31.38						77.39		
A. Enteric fermentation		34.71							34.71		
B. Manure management		11.30	12.27						23.57		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA, NE	19.11						19.11		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		NO, NA	NO, NA						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⁾	4.12	NO, NE	0.44						4.56		
A. Forest land	NO	NO	NO						NO		
B. Cropland	2.86	NO, NE	0.32						3.18		
C. Grassland	-0.14	NO	NO						-0.14		
D. Wetlands	NO, NE	NO	NO						NO		
E. Settlements	0.61	NO	0.06						0.66		
F. Other land	0.79	NO	0.07						0.86		
G. Harvested wood products	NO								NO		
H. Other	NO	NO	NO						NO		
5. Waste	0.54	145.88	6.02						152.45		
A. Solid waste disposal	NO, NA	142.67							142.67		
B. Biological treatment of solid waste		1.10	NO, NA						1.10		
C. Incineration and open burning of waste	0.54	0.00	0.14						0.68		
D. Waste water treatment and discharge		2.11	5.89						8.00		
E. Other	NO	NO	NO						0.00		
6. Other (as specified in summary 1.A)											NO
Memo items:⁽²⁾											
International bunkers											
Aviation	510.45	0.10	5.11						515.66		
Navigation	8073.81	26.26	18.78						8118.85		
Multilateral operations											
CO₂ emissions from biomass											
CO₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									2122.92	739.17	1 383.749
Total CO₂ equivalent emissions with land use, land-use change and forestry									2127.48		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									2122.92		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									2127.48		

(1) For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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.

Agriculture: Changes in the methodology of the agriculture sector, following EC review, as well as updates in the EFs and methods following revisions due to IPCC 2019 International bunkers: because data on international bunkers is still being gathered, the emissions values presented here are derived from a trend extrapolation of historic data.

IPPU: The implementation in the estimation of emissions of the *revised estimate* following the *recommendation* made during the *2020 Comprehensive Review* in sub-category 2F1d Transport Refrigeration, which includes also 2F1e Mobile Air Conditioning has, inevitably, resulted in a decrease in emissions.

Netherlands (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2020
Submission Proxy (prelim)
Country NLD
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS	
												CO ₂ equivalent (kt)
Total (net emissions)⁽¹⁾	160836.14	17039.22	8372.62	1775.36	112.60	117.97		NO	NO,IE	188253.91		
1. Energy	148959.90	2156.28	604.26							151720.44	78 054	73 667
A. Fuel combustion (sectoral approach)	147859.93	1693.53	604.26							150157.73	76 998	73 160
1. Energy industries	57608.23	126.09	251.90							57986.22	53 695	4 291
2. Manufacturing industries and construction	27771.00	65.48	43.22							27879.71	22 640	5 240
3. Transport	30689.13	66.64	256.52							31012.29		
4. Other sectors	31632.44	1434.97	50.12							33117.53	663	32 455
5. Other	159.12	0.35	2.50							161.97		
B. Fugitive emissions from fuels	1099.97	462.75	NO,IE,NA							1562.72	1 056	507
1. Solid fuels	72.78	4.84	NO							77.63		
2. Oil and natural gas	1027.19	457.90	NO,IE,NA							1485.09		
C. CO ₂ transport and storage	NO									NO		
2. Industrial processes and product use	7184.38	334.61	1440.23	1775.36	112.60	117.97		NO	NO,IE	10965.14	5 692	5 274
A. Mineral industry	1198.93									1198.93	641	558
B. Chemical industry	5624.57	287.85	1353.22	380.96	46.53	NO		NO	NO,IE	7693.12	5 005	2 688
C. Metal industry	18.11	NO,IE,NA	NO	NO	22.48	NO		NO		40.59	45	0
D. Non-energy products from fuels and solvent use	327.15	0.31	NO,NA							327.46		
E. Electronic Industry				NO	43.59	NO		NO	NO,IE	43.59		
F. Product uses as ODS substitutes				1394.40	NO	NO		NO	NO	1394.40		
G. Other product manufacture and use	0.72	46.45	87.01	NO	NO	117.97				252.15		
H. Other	14.91	NO	NO							14.91		
3. Agriculture	35.88	11839.97	6062.12							17937.96		
A. Enteric fermentation		8106.10								8106.10		
B. Manure management		3733.87	759.75							4493.62		
C. Rice cultivation		NO	NO							NO		
D. Agricultural soils		NO	5302.38							5302.38		
E. Prescribed burning of savannas		NO	NO							NO		
F. Field burning of agricultural residues		NO	NO							NO		
G. Liming	35.88									35.88		
H. Urea application		IE								IE		
I. Other carbon-containing fertilizers	NO									NO		
J. Other	NO	NA	NA							NO,NA		
4. Land use, land-use change and forestry⁽¹⁾	4655.98	0.32	99.66							4755.97		
A. Forest land	-1870.60	0.27	5.02							-1865.30		
B. Cropland	1593.90	NO,NE,IE	48.51							1642.42		
C. Grassland	3055.51	0.05	7.51							3063.07		
D. Wetlands	39.22	NO,NE,IE	2.63							41.85		
E. Settlements	1544.77	NO	26.56							1571.34		
F. Other land	182.38	NO	9.42							191.81		
G. Harvested wood products	110.78									110.78		
H. Other	IE,NE,NO	IE,NE,NO	IE,NE,NO							NO,NE,IE		
5. Waste	NO,IE,NA	2708.04	166.35							2874.39		
A. Solid waste disposal	NO,NA	2367.73								2367.73		
B. Biological treatment of solid waste		112.11	89.84							201.95		
C. Incineration and open burning of waste	NO,IE,NA	2.27	1.41							3.68		
D. Waste water treatment and discharge		225.94	75.10							301.04		
E. Other	NO	NO	NO							NO		
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO		NO	NO	NO		
Memo items:⁽²⁾												
International bunkers	46610.05	81.25	369.10							47060.40		
Aviation	11889.76	2.08	99.11							11990.95		
Navigation	34720.29	79.17	269.99							35069.45		
Multilateral operations	IE	IE	IE							IE		
CO₂ emissions from biomass	15427.06									15427.06		
CO₂ captured	NO									NO		
Long-term storage of C in waste disposal sites	NO									NO		
Indirect N₂O			NO,NE									
Indirect CO₂⁽³⁾	440.40											
Total CO₂ equivalent emissions without land use, land-use change and forestry										183 497.95	83 745.27	99 753
Total CO₂ equivalent emissions with land use, land-use change and forestry										188253.91		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry										183938.35		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										188694.31		

⁽¹⁾ For carbon dioxide (CO₂) 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 emissions

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

⁽³⁾ In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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.

All change can be explained by corresponding changes in activity level. The highlights are:

Energy

Energy industries: decrease due to less coal combustion partly counter balanced by increase in natural gas combustion

Industry

Decreased CO₂ emissions as result of closure of Cement plant

Poland (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission Proxy
Country Poland
Geographical scope⁽⁶⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
	CO ₂ equivalent (kt)									CO ₂ equivalent (Gg)	
Total (net emissions)⁽¹⁾											
1. Energy	299 502.40	20 910.91	2 664.76						323 078.08		
A. Fuel combustion (sectoral approach)	294 785.77	3 533.30	2 664.14						300 983.20		
1. Energy industries	147 129.41	91.90	659.16						147 880.47		
2. Manufacturing industries and construction	30 651.17	111.46	182.15						30 944.78		
3. Transport	66 022.67	142.87	716.17						66 881.71		
4. Other sectors	50 982.52	3 187.07	1 106.66						55 276.24		
5. Other									NO,IE		
B. Fugitive emissions from fuels	4 716.64	17 377.62	0.63						22 094.88		
1. Solid fuels	2 996.24	14 569.32	NA						17 565.56		
2. Oil and natural gas	1 720.40	2 808.30	0.63						4 529.32		
C. CO ₂ transport and storage	NO								NO		
2. Industrial processes and product use	19 271.88	64.24	826.64	4 172.71	11.32	107.37	NO,NA	NO,NA	24 454.16		
A. Mineral industry	11 635.10								11 635.10		
B. Chemical industry	4 502.94	51.33	692.99	NA	NO,NA	NO,NA	NA	NA	5 247.26		
C. Metal industry	2 352.41	12.91	NA	NA	NO,NA	NO,NA	NA	NA	2 365.32		
D. Non-energy products from fuels and solvent use	781.43	NO,NA	NO,NA						781.43		
E. Electronic industry				NO	NO	NO	NO	NO	NO		
F. Product uses as ODS substitutes				4 172.71	11.32	NO	NO	NO	4 184.03		
G. Other product manufacture and use	NA	NA	133.66	NA	NA	107.37	NA	NA	241.03		
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO		
3. Agriculture	889.56	14 703.14	17 461.24						33 053.93		
A. Enteric fermentation		13 199.77							13 199.77		
B. Manure management		1 478.79	2 666.23						4 145.03		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA	14 783.02						14 783.02		
E. Prescribed burning of savannas			NO						NO		
F. Field burning of agricultural residues		24.58	11.98						36.56		
G. Liming	541.35								541.35		
H. Urea application	348.20								348.20		
I. Other carbon-containing fertilizers	NO								NO		
J. Other	NO,NA	NO,NA	NO,NA						NO,NA		
4. Land use, land-use change and forestry⁽¹⁾	-37 156.46	16.70	688.73						-36 451.04		
A. Forest land	-36 623.56	12.21	8.05						-36 603.30		
B. Cropland	-611.95	NO,NA	12.15						-599.80		
C. Grassland	-70.71	4.49	2.96						-63.26		
D. Wetlands	1 881.75	NO,NA	NO,NA						1 881.75		
E. Settlements	3 127.04	NO	665.56						3 792.60		
F. Other land	NO,NA	NO,NA	NO,NA						NO,NA		
G. Harvested wood products	-4 859.03								-4 859.03		
H. Other	NA	NA	NA						NA		
5. Waste	450.06	8 714.83	919.93						10 084.82		
A. Solid waste disposal	NO,NA	6 043.54							6 043.54		
B. Biological treatment of solid waste		107.80	77.10						184.90		
C. Incineration and open burning of waste	450.06	0.00	71.68						521.74		
D. Waste water treatment and discharge		2 563.48	771.15						3 334.63		
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	3 824.49	2.50	31.55						3 858.54		
Aviation	2 976.49	0.52	24.81						3 001.82		
Navigation	848.00	1.98	6.74						856.71		
Multilateral operations	NA	NA	NA						NA		
CO₂ emissions from biomass	33 879.17								33 879.17		
CO₂ captured	NO,IE,NA								NO,IE,NA		
Long-term storage of C in waste disposal sites	46 091.85								46 091.85		
Indirect N₂O			NA								
Indirect CO₂⁽³⁾	NA										
	Total CO₂ equivalent emissions without land use, land-use change and forestry									183 684.727	206 852.281
	Total CO₂ equivalent emissions with land use, land-use change and forestry										
	Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry										
	Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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 decreased by about 5.4% between 2018 and 2019.

Main drivers for change in GHG emissions:

1. Energy - stationary fuel combustion

The main reason of decrease in GHG emission from fuel combustion in stationary sources (by 7%) is decrease in consumption of coal (by 9%) and lignite (by 14 %)

1. Energy - transport:

Increase in emissions by 2.4% is triggered by growing fuels use: petrol by 3.8%, diesel by 2.1% and LPG by 1.7%

2. Industrial processes and product use:

Decrease in emissions (by about 2%) is observed mostly due to decrease in emission from ammonia production (by almost 4%) as well as drop in metal production.

Also decrease in lime production and N₂O process emissions from nitric acid production has been observed.

3. Agriculture:

Slight decrease in emissions (by about 0.2%) relates mostly to the smaller population of swine by 8.8% as well as to lower use of inorganic fertilisers by almost 16%

5. Waste

Decrease of emissions is driven by depopulation of Poland (-0.07%), decrease of amount of incinerated ISW (by 33.0%) and decrease of amount of composted non-municipal waste (by 62.8%)

4. LULUCF and memo items - data the same as for 2018

Portugal (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year **Proxy 2019**
Submission **July 2020**
Country **Portugal**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	39 317.87	9 281.05	3 442.35	3 579.81	20.33	23.72	NO	NO	55 665.13		
1. Energy	43 714.05	386.53	560.44						44 661.02	19 097	25 564
A. Fuel combustion (sectoral approach)	42 607	317	558						43 482	18 002	25 480
1. Energy industries	12 686	11	107						12 804	11 974	830
2. Manufacturing industries and construction	7 771	55	115						7 941	5 504	2 437
3. Transport	17 700	23	162						17 886	524	17 361
4. Other sectors	4 392	228	172						4 792	0	4 792
5. Other	59	0	0						59	0	59
B. Fugitive emissions from fuels	1 107	69	3						1 179	1 095	84
1. Solid fuels	0	16	0						16	15	1
2. Oil and natural gas	1 107	54	3						1 163	1 080	83
C. CO ₂ transport and storage	0.00								0.00	0.00	0.00
2. Industrial processes and product use	3 780.80	17.14	67.79	3 579.81	20.33	23.72	0.00	0.00	7 489.58	3 009	4 480
A. Mineral industry	3 040.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3 040.96	2 853	188
B. Chemical industry	428.63	16.24	36.08	NO	NO	NO	NO	NO	480.96	94	387
C. Metal industry	94.15	NO	NO	NO	NO	NO	NO	NO	94.15	62	32
D. Non-energy products from fuels and solvent use	217.06	0.89	NO						217.95	0	218
E. Electronic Industry				NE	NE	NE	NE	NO	NO,NE	0	NO,NE
F. Product uses as ODS substitutes				3 579.81	20.33				3 600.14	0	3 600
G. Other product manufacture and use	NO	NO	31.70	NO	NO	23.72	NO	NO	55.42	0	55
H. Other	NO	NO	NO						NO	0	NO
3. Agriculture	50.85	4 426.82	2 303.87						6 781.53	0	6 782
A. Enteric fermentation		3 522.66							3 522.66	0	3 523
B. Manure management		732.76	186.52						919.28	0	919
C. Rice cultivation		138.33							138.33	0	138
D. Agricultural soils		NO	2 098.04						2 098.04	0	2 098
E. Prescribed burning of savannas		NO	NO						NO	NO	NO
F. Field burning of agricultural residues		33.07	19.31						52.38	0	52
G. Liming	7.24								7.24	0	7
H. Urea application	43.60								43.60	0	44
I. Other carbon-containing fertilizers	NO								NO	NO	NO
J. Other	NO	NO	NO						NO	NO	NO
4. Land use, land-use change and forestry⁽¹⁾	-8 259.62	98.31	314.26						-7 847.05		
A. Forest land	-10 382	44.23	28.89						-10 309.18		
B. Cropland	543.07	2.59	45.80						591.47		
C. Grassland	93.51	0.84	25.09						119.45		
D. Wetlands	310.97	0.00	24.55						335.52		
E. Settlements	2 274.13	0.00	166.49						2 440.62		
F. Other land	-995.04	50.65	23.43						-920.97		
G. Harvested wood products	-103.96								-103.96		
H. Other	NO	NO	NO						NO		
5. Waste	31.80	4 352.26	195.99						4 580.05	0	4 580
A. Solid waste disposal	NO	3 551.19	0.00						3 551.19	0	3 551
B. Biological treatment of solid waste		25.02	15.05						40.07	0	40
C. Incineration and open burning of waste	31.80	0.22	0.90						32.91	0	33
D. Waste water treatment and discharge		775.84	180.04						955.88	0	956
E. Other	NO	0.001	0.001						0.001	0	0
6. Other (as specified in summary 1.A)											
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 ₂ O			NE								
Indirect CO₂⁽³⁾	148.34										
Total CO₂ equivalent emissions without land use, land-use change and forestry									63 512.18	22 106.55	41 405.63
Total CO₂ equivalent emissions with land use, land-use change and forestry									55 665.13		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									63 660.52		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									55 813.47		

(1) For carbon dioxide (CO₂) 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

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

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

The -7.9% decrease of emissions in the Energy sector is explained with the reduction of consumption of solid fuels, due to an decrease electric energy production, compensated with an increase in electricity imports.
Fuel/Energy consumption: <http://www.dgeg.pt/>

There is an estimated slight increase of about 0.6% in the IPPU emissions mostly due to the balance of opposite tendencies of the two main categories:
- decrease in cement industry (2A1) emissions.
- increase of the use of F-gases

There is an estimated slight decrease of about 0.3% in the agriculture GHG emissions mostly due to balance of opposite tendencies of main categories:
- 3A (Enteric Fermentation): related to an increase in the livestock - particularly no-dairy cattle and sheep;
- 3D (Agriculture Soils): reduction in the application of synthetic fertilisers.

The LULUCF sector has increased its net-sink value, mostly due to a reduction in forest carbon losses (harvesting).

There is an estimated stabilisation of the emissions in the waste sector due to a balance between a slight decrease in emissions from land deposition (5A) and an estimated increase in emissions related to WWT.

Romania (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS										Year	2019
(Sheet 1 of 1)										Submission	2020
										Country	Romania
										Geographical scope ⁽⁴⁾	
GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
SINK CATEGORIES	CO ₂ equivalent (kt)									CO ₂ equivalent (Gg)	
Total (net emissions)⁽¹⁾	NE	NE	NE	2322.82	3.83	77.12	NO	NO	NE	NE	NE
1. Energy	NE	NE	NE						NE	NE	NE
A. Fuel combustion (sectoral approach)	NE	NE	NE						NE	NE	NE
1. Energy industries	NE	NE	NE						NE	NE	NE
2. Manufacturing industries and construction	NE	NE	NE						NE	NE	NE
3. Transport	NE	NE	NE						NE	NE	NE
4. Other sectors	NE	NE	NE						NE	NE	NE
5. Other	NE	NE	NE						NE	NE	NE
B. Fugitive emissions from fuels	NE	NE	NE						NE	NE	NE
1. Solid fuels	NE	NE	NE						NE	NE	NE
2. Oil and natural gas	NE	NE	NE						NE	NE	NE
C. CO ₂ transport and storage									NE	NE	NE
2. Industrial processes and product use	10731.01	8.69	121.04	2322.82	3.83	77.12	NO	NO	13264.52	9 866.32	3 398.20
A. Mineral industry	4945.37								4945.37	4 667.24	278.13
B. Chemical industry	936.30	4.39	118.96	NO	NO	NO	NO	NO	1059.65	1 026.60	33.04
C. Metal industry	4175.47	4.30	NO	NO	3.82	NO,NA	NO	NO	4183.59	4 170.87	12.72
D. Non-energy products from fuels and solvent use	673.88	NO,NE	NO,NE						673.88	1.61	672.27
E. Electronic Industry				NO	NO	NO	NO	NO	NO	NA	NO
F. Product uses as ODS substitutes				2322.82	0.01	NO	NO	NO	2322.83	NA	2 322.83
G. Other product manufacture and use	NO	NO	2.08	NO	NO	77.12	NO	NO	79.21	NA	79.21
H. Other	NO,NE	NO,NE	NO,NE	NO	NO	NO	NO	NO	NO,NE	NA	NO,NE
3. Agriculture	123.18	8290.89	10335.04						18749.11		18 749.11
A. Enteric fermentation		7329.32							7329.32		7 329.32
B. Manure management		637.52	1086.33						1723.85		
C. Rice cultivation		29.03							29.03		
D. Agricultural soils		NE	9141.26						9141.26		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		295.02	107.45						402.47		
G. Liming	42.79								42.79		
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⁾	NA	NA	NA						NA		
A. Forest land	NA	NA	NA						NA		
B. Cropland	NA	NA	NA						NA		
C. Grassland	NA	NA	NA						NA		
D. Wetlands	NA	NA	NA						NA		
E. Settlements	NA	NA	NA						NA		
F. Other land	NA	NA	NA						NA		
G. Harvested wood products	NA								NA		
H. Other	NA	NA	NA						NA		
5. Waste	10.69	5453.17	455.26						5919.12		
A. Solid waste disposal	NA	3757.62							3757.62		
B. Biological treatment of solid waste		33.77	24.15						57.93		
C. Incineration and open burning of waste	10.69	0.03	1.47						12.19		
D. Waste water treatment and discharge		1661.75	429.63						2091.39		
E. Other	NA	NA	NA						NA		
6. Other (as specified in summary 1.A)	NO	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		
CO₂ emissions from biomass	NE								NE		
CO₂ captured	NE								NE		
Long-term storage of C in waste disposal sites	NA								NA		
Indirect N₂O			2744.96								
Indirect CO₂⁽³⁾	NO,NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry										NE	NE
Total CO₂ equivalent emissions with land use, land-use change and forestry										NA	NA
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry										NE	NE
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										NA	NA

(1) For carbon dioxide (CO₂) 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 CO₂ the national totals shall be provided with and without indirect CO₂.

(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.

Sweden (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission Subm 2021 pr
Country Sweden
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾	39 802	4 320	4 479	1 074	50	32			49 756		
1. Energy	32 887	213	622						33 721		
A. Fuel combustion (sectoral approach)	32 441	156	621						33 217		
1. Energy industries	7 686	46	229						7 961		
2. Manufacturing industries and construction	6 350	24	141						6 516		
3. Transport	15 861	17	156						16 034		
4. Other sectors	2 387	68	92						2 548		
5. Other	156	0	2						159		
B. Fugitive emissions from fuels	446	57	1						504		
1. Solid fuels											
2. Oil and natural gas											
C. CO ₂ transport and storage											
2. Industrial processes and product use	6 662	9	235	1 074	50	32			8 062		
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	129	3 270	3 392						6 790		
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⁾											
A. Forest land											
B. Cropland											
C. Grassland											
D. Wetlands											
E. Settlements											
F. Other land											
G. Harvested wood products											
H. Other											
5. Waste	124	829	230						1 183		
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)											
Memo items:⁽²⁾											
International bunkers											
Aviation											
Navigation											
Multilateral operations											
CO ₂ emissions from biomass											
CO ₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N ₂ O											
Indirect CO ₂ ⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry									49 756	19 243	30 513
Total CO₂ equivalent emissions with land use, land-use change and forestry											
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry											
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry											

⁽¹⁾ For carbon dioxide (CO₂) 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 emissions positive (+).

⁽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 CO₂ the national totals shall be provided with and without indirect CO₂.

⁽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.

Swedish greenhouse gas emissions were about 49.8 million tonnes of carbon dioxide equivalents in 2019, which is equivalent to a decrease by almost four percent comparing the approximated greenhouse gas inventory for 2019 with the complete reported inventory for 2018.

Domestic transportation (CRF 1A3) accounted for one third of Swedish greenhouse gas emissions. Emissions from domestic transportation decreased with 2.7 percent in 2019 compared to 2018. The estimated emissions for 2019 were based on projections from e.g. distance driven for vehicles using available data from Transport Analysis. The decrease is with other words due to a decrease in traffic.

Industrial emissions and product use (including stationary, fugitive and process from manufacturing industries and construction, CRF1A2, 1B and CRF 2) accounted for one third of Swedish greenhouse gas emissions. Industrial emissions were at the same level in 2019 compared to 2018. Industrial emissions are described at the aggregate level since the method for allocation of facilities' emissions to different CRF-categories is based on a model in the case of the approximated greenhouse gas inventory. Industrial emissions for 2019 were based on available energy statistics and adjusted based on information provided from the EU ETS-reporting. Emission trends within this sector varies between different subsectors, where some sectors have increasing emissions and some decreasing.

Energy industries (CRF 1A1) accounted for 16 percent of Swedish greenhouse gas emissions. These emissions decreased by 15.5 percent in 2019 compared to 2018. The estimated emissions for the heat and power production facilities were based on available energy statistics. Trends in this sector depend largely on weather and prices.

Agricultural emissions (CRF 3) were assumed to be equal to the previous year due to lack of data to support an approximated estimate for 2019.

Emissions from waste (CRF 5) decreased by five percent in 2019 compared to 2018, based on an assumed annual reduction rate due to lack of data. The waste sector has been decreasing steadily since the beginning of the 1990s due of extensive legislation in the sector.

Additional information on the approximated greenhouse gas emissions inventory is available at (in Swedish):
<http://www.naturvardsverket.se/snabbtslapp>

Please note that the Swedish EPA use a different sectoral division than CRF-categories in national reporting that is more closely related to implemented and proposed policies and measures.

Please also note that data on emissions within ETS and non-ETS sectors are preliminary and should be used with caution. The estimate for the ETS sector includes domestic aviation (CRF 1A3a).

Slovenia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year 2019
Submission 2020
Country Slovenia
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
										CO ₂ equivalent (kt)	
Total (net emissions)⁽¹⁾	14012.43	1934.11	815.98	300.05	11.81	0.00	NO	NO	17074.37		
1. Energy										5 523	8 138
A. Fuel combustion (sectoral approach)	13133.60	376.92	150.92						13283.09	5 460	7 823
1. Energy industries	4524.47	2.89	21.72						4549.08	4 389	161
2. Manufacturing industries and construction	1826.45	5.63	20.69						1852.77	1 071	782
3. Transport	5476.78	6.72	62.57						5546.08	NO	5 546
4. Other sectors	1177.43	107.91	45.91						1331.25	NO	1 331
5. Other	3.88	0.00	0.03						3.91	NO	4
B. Fugitive emissions from fuels	124.59	253.75	0.00						378.34	64	315
1. Solid fuels	124.46	214.57	NO						339.03	64	275
2. Oil and natural gas	0.13	39.18	0.00						39.31	NO	39
C. CO ₂ transport and storage	NO								0.00	NO	0
2. Industrial processes and product use	831.07	0.00	98.50	300.05	11.81	0.00	NO	NO	1241.43	730	511
A. Mineral industry	564.47								564.47	549	15
B. Chemical industry	56.97	NO,NA	NO	NO	NO	NO	NO	NO	56.97	NO	57
C. Metal industry	178.37	NO,NA	NO	NO	11.81	NO	NO	NO	190.18	181	9
D. Non-energy products from fuels and solvent use	31.26	NA	NA						31.26	NO	31
E. Electronic Industry				NO	NO	NO	NO	NO	0.00	NO	0
F. Product uses as ODS substitutes				300.05	NO		NO	NO	300.05	NO	300
G. Other product manufacture and use	NO	NO	98.50	NO	NO	NO	NO	NO	98.50	NO	99
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	0.00	NO	0
3. Agriculture	25.44	1189.43	520.34	NO	NO	NO	NO	NO	1735.20		
A. Enteric fermentation		937.71							937.71		
B. Manure management		251.71	80.89						332.60		
C. Rice cultivation		NO							0.00		
D. Agricultural soils		NO	439.45						439.45		
E. Prescribed burning of savannas		NO	NO						0.00		
F. Field burning of agricultural residues		NO	NO						0.00		
G. Liming	11.54								11.54		
H. Urea application	10.52								10.52		
I. Other carbon-containing fertilizers	3.38								3.38		
J. Other	NO	NO	NO						0.00		
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	22.32	367.77	46.22						436.31		
A. Solid waste disposal	NE	225.19							225.19		
B. Biological treatment of solid waste		11.50	8.22						19.72		
C. Incineration and open burning of waste	22.32	0.00	0.09						22.41		
D. Waste water treatment and discharge		131.08	37.90						168.98		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾											
International bunkers	585.22	1.16	4.56						590.93		
Aviation	77.30	0.01	0.64						77.96		
Navigation	507.91	1.15	3.91						512.97		
Multilateral operations	0.55	0.00	0.00						0.55		
CO ₂ emissions from biomass	2658.98								2658.98		
CO ₂ captured	NO								NO		
Long-term storage of C in waste disposal sites	NO								NO		
Indirect N ₂ O			NE								
Indirect CO ₂ ⁽³⁾	NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									17074.37	6 254	10 821
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

(1) For carbon dioxide (CO₂) 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 emissions

(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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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 2019, emissions of GHG decreased by 2.9 % (-428 kt CO2 eq) compared to 2018.

Emissions in the Energy sector decreased by 3.5% (-491 kt CO2 eq).

The largest decrease occurred in the electricity production in thermal power plants by -5.2% (251 kt eq) and in the road transport by -4,8% (278 kt CO2 eq). It should be noted that due to the non-reporting of one unit, the estimate for emissions from transport is very uncertain.

Emissions from IPPU increased by 4.6% (55 kt CO2 eq).

The largest increase was in category other product use by 121% (54 kt CO2 eq).

Emissions for this category are estimated on the basis of export and import data, so the fluctuations between years are often quite large.

Emissions in agriculture sector increased by 0.8% (13 kt CO2 eq).

The increase is a consequence of the increase of emissions of CH4 from enteric fermentation by 1.1% (10 kt CO2 eq).

Emissions from waste sector decreased by -1.2% (-5 kt CO2 eq).

The main reason for lower emissions is a decrease of emissions from SWDS by -3.8% (9 kt CO2 eq).

Slovakia (submitted by member state)

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS										Year	
(Sheet 1 of 1)										2019	
										Submission	
										15.07.2020	
										Country	
										Slovakia	
										Geographical scope ⁽⁴⁾	
										country	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
	CO ₂ equivalent (kt)									CO ₂ equivalent (Gg)	
Total (net emissions)⁽²⁾	27 851.99	4 493.75	2 027.12	702.77	7.78	9.39	NO	NO	35 092.80		
1. Energy	26 589.93	1 807.88	222.13						28 619.94	12 087.36	16 532.58
A. Fuel combustion (sectoral approach)	26 569.31	224.10	222.13						27 015.54	12 087.36	14 928.18
1. Energy industries	6 857.20	14.19	35.29						6 906.68	6 047.03	859.65
2. Manufacturing industries and construction	6 774.42	15.92	31.14						6 821.48	5 633.03	1 188.45
3. Transport	8 132.63	7.84	93.40						8 233.87	397.49	7 836.38
4. Other sectors	4 728.21	186.03	61.92						4 976.16	9.81	4 966.35
5. Other	76.85	0.12	0.38						77.35	NO	77.35
B. Fugitive emissions from fuels	20.62	1 583.78	0.00						1 604.40	NO	1 604.40
1. Solid fuels	19.44	218.95	NO						238.39	NO	238.39
2. Oil and natural gas	1.18	1 364.83	0.00						1 366.01	NO	1 366.01
C. CO ₂ transport and storage	NO								NO	NO	NO
2. Industrial processes and product use	7 826.39	1.84	160.73	702.77	7.78	9.39	NO	NO	8 708.90	7 816.48	892.42
A. Mineral industry	2 254.36								2 254.36	2 244.68	9.68
B. Chemical industry	1 599.56	0.52	91.24	NO	NO	NO	NO	NO	1 691.32	1 690.18	1.14
C. Metal industry	3 873.86	1.32	NO	NO	7.78	NO	NO	NO	3 882.96	3 881.63	1.33
D. Non-energy products from fuels and solvent use	98.62	NO	NO						98.62	NO	98.62
E. Electronic industry				NO	NO	NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				702.77	NO	NO	NO	NO	702.77	NO	702.77
G. Other product manufacture and use	NO	NO	69.49	NO	NO	9.39	NO	NO	78.88	NO	78.88
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	75.56	1 074.57	1 475.16						2 625.29	NO	2 625.29
A. Enteric fermentation		973.53							973.53	NO	973.53
B. Manure management		101.04	165.25						266.29	NO	266.29
C. Rice cultivation		NO							NO	NO	NO
D. Agricultural soils		NO	1 309.92						1 309.92	NO	1 309.92
E. Prescribed burning of savannas		NO	NO						NO	NO	NO
F. Field burning of agricultural residues		NO	NO						NO	NO	NO
G. Liming	12.02								12.02	NO	12.02
H. Urea application	63.54								63.54	NO	63.54
I. Other carbon-containing fertilizers	NO								NO	NO	NO
J. Other	NO	NO	NO						NO	NO	NO
4. Land use, land-use change and forestry⁽¹⁾	-6 647.25	24.50	34.07						-6 588.67		
A. Forest land	-4 653.25	24.50	16.16						-4 612.59		
B. Cropland	-1 153.41	NO	7.98						-1 145.43		
C. Grassland	-119.24	NO	0.31						-118.93		
D. Wetlands	NO	NO	NO						NO		
E. Settlements	82.63	NO	4.57						87.20		
F. Other land	79.26	NO	5.06						84.32		
G. Harvested wood products	-883.24								-883.24		
H. Other	NO	NO	NO						NO		
5. Waste	7.36	1 584.95	135.02						1 727.33	NO	1 727.33
A. Solid waste disposal	NO	1 185.65							1 185.65	NO	1 185.65
B. Biological treatment of solid waste		116.79	83.52						200.31	NO	200.31
C. Incineration and open burning of waste	7.36	0.01	0.80						8.17	NO	8.17
D. Waste water treatment and discharge		282.50	50.70						333.20	NO	333.20
E. Other	NO	NO	NO						NO	NO	NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items⁽²⁾											
International bunkers	203.90	0.08	1.65						205.63		
Aviation	188.09	0.05	1.52						189.66		
Navigation	15.81	0.04	0.13						15.97		
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass	6 941.20								6 941.20		
CO₂ captured	NO,NE								NO,NE		
Long-term storage of C in waste disposal sites	2 754.30								2 754.30		
Indirect N₂O			NO,NE,IE								
Indirect CO₂⁽³⁾	NO,NE,IE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									41 681.47	19 903.84	21 777.62
Total CO₂ equivalent emissions with land use, land-use change and forestry									35 092.80		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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.

<p>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.</p>
<p>ENERGY: Based on preliminary data (and EU-ETS reports) a decrease of CO2 emission is expected in category 1.A.1 and 1.A.2. The decrease is mainly caused by significant reduction of steel production in main iron and steel production facility. Similar trend is in corresponding IPPU categories. The decrease of CO2 emission from iron and steel production is on a level of 1 800 Gg of CO2. Due to partial shutdown of one major CHP plant, decrease in 1.A.1.a category is also expected. These facts have influence also on the decreasing emissions in ETS part of inventory. There is no ETS data for 1.A.4. and 1.A.5 categories, therefore the emissions are estimated mainly by the fuel consumption trends from previous years. In the 1.A.4 category, a slight increase of emissions is expected. In the 1.A.5 category, the emissions remain practically at the same level as in previous year.</p>
<p>Transport: Rise of emissions in the transport sector is a result of increasing fuel consumption in road transport and navigation. Petrol fuel consumption rose by 4% and diesel oil consumption rose by 7.5% in 2019. This caused major increase of CO2 emissions in road transport and navigation. Aviation emissions are estimated by the fuel consumption trends from previous years.</p>
<p>MEMO ITEMS: Emissions are not significant and proxy is calculated based on the real consumption for the year 2019.</p>
<p>IPPU: Categories 2.A, 2.B and 2.C were estimated based on the EU ETS verified GHG emissions 2019. ESD emissions in categories 2.A, 2.B, 2.C, 2.D and 2.G were extrapolated based on the 5-years average.</p>
<p>AGRICULTURE: The official statistics of livestock number, animal production data and consumption of organic and inorganic fertilizers were implemented into the 2019 proxy estimates. Information on animal waste management systems and information on feeding ration was not available. Missing data was extrapolated based on the previous 5-year mean. Emissions decrease in significant subcategories of emissions. Main drivers of decrease were decreasing in the number of dairy cattle, pigs, poultry and sheep. We recorded also decrease in mineral fertilization use. The country-specific methodology on FraCleach determination was implemented in the 3.D.2.2 category, which has an influence on decreasing of emission.</p>
<p>LULUCF: A. FOREST LAND: Emissions of CO2, CH4 and N2O are preliminary calculated using new input data from 2019 and the same method as in the NIR. 4.B CROPLAND - Emissions of CO2, CH4 and N2O are</p>
<p>WASTE: The Waste sector contributes to about 5% of total emissions in Slovakia. Emissions from solid waste disposal represent 69% of emissions in the Waste Sector, emissions from wastewater treatment 2%, biological treatment of waste 12% and non-biogenic waste incineration contributes 0.5%. 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 are increasing at a rate of 4% per year due to increasing share of amount of waste</p>

United Kingdom (submitted by country)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)

Year 2019
Submission VII.20
Country United Kingdom of Great Britain and Northern Ireland
Geographical scope⁽⁴⁾ UK only, i.e. EU coverage excluding Gibraltar

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	CO ₂ equivalent (Gg)	
										ETS	non-ETS
Total (net emissions)⁽¹⁾	351507.14	50304.38	19940.96	12708.15	250.65	532.73	NO	0.57	435244.57		
1. Energy	348159.33	IE	IE							109 849	238 310
A. Fuel combustion (sectoral approach)	343576.79	IE	IE							106 526	237 051
1. Energy industries	85371.29	IE	IE							77 192	8 180
2. Manufacturing industries and construction	49434.60	IE	IE							26 316	23 119
3. Transport	117389.99	IE	IE							1 314	116 076
4. Other sectors	89955.50	IE	IE							1 704	88 251
5. Other	1425.41	IE	IE							NO	1 425
B. Fugitive emissions from fuels	4582.55	IE	IE							3 324	1 259
1. Solid fuels	303.97	IE	IE							NO	304
2. Oil and natural gas	4278.58	IE	IE							3 324	955
C. CO ₂ transport and storage										NO	NO
2. Industrial processes and product use	13543.36	IE	IE	IE	IE	IE	NO	IE		11 758	1 786
A. Mineral industry	6278.72									6 205	73
B. Chemical industry	4489.26	IE	IE	NO	IE	NO	NO	NO		3 319	1 170
C. Metal industry	2404.40	IE	IE	IE	IE	IE	NO			2 233	171
D. Non-energy products from fuels and solvent use	332.70	NO,IE	NO,NE,IE							NO	333
E. Electronic Industry				IE	NO,NE,IE	NO,IE	NO	IE		NO	NO
F. Product uses as ODS substitutes				IE	NO	NO	NO	NO		NO	NO
G. Other product manufacture and use	38.28	NO	IE		IE	IE				0	38
H. Other	NO,NE,IE	IE	NO							NO	NO,NE,IE
3. Agriculture	1266.31	IE	IE								
A. Enteric fermentation			IE								
B. Manure management			IE	IE							
C. Rice cultivation		NO									
D. Agricultural soils		NE	IE								
E. Prescribed burning of savannas		NO	NO								
F. Field burning of agricultural residues		NO	NO								
G. Liming	926.67										
H. Urea application	339.64										
I. Other carbon-containing fertilizers	NO										
J. Other	NA	NA	NA								
4. Land use, land-use change and forestry⁽¹⁾	-11699.94	IE	IE								
A. Forest land	-18330.57	IE	IE								
B. Cropland	11046.93	IE	IE								
C. Grassland	-8976.33	IE	IE								
D. Wetlands	334.99	NO,NE,NA	IE								
E. Settlements	6554.86	IE	IE								
F. Other land	NO	NO	NO								
G. Harvested wood products	-2329.82										
H. Other	NO	NO	NO								
5. Waste	238.07	IE	IE								
A. Solid waste disposal	NO,NE	IE									
B. Biological treatment of solid waste		IE	IE								
C. Incineration and open burning of waste	238.07	IE	IE								
D. Waste water treatment and discharge		IE	IE								
E. Other	NO	NO	NO								
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO			
Memo items:⁽²⁾											
International bunkers											
Aviation											
Navigation											
Multilateral operations											
CO₂ emissions from biomass											
CO₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry											
Total CO₂ equivalent emissions with land use, land-use change and forestry											
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry											
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry											

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂ the national totals shall be provided with and without indirect CO₂.

⁽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.

Estimated CO2 emissions for 2019 have been calculated using the quarterly energy consumption statistics for the UK.

The statistical release and methodology document describing the calculations are available below:

<https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2019>

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/789856/provisional-greenhouse-gas-emissions-statistics-methodology-summary.pdf

The calculations described in the above document are carried out using UK only data excluding the Crown Dependencies and Overseas Territories

The data presented above is consistent with this data set, no changes have been made to the geographical coverage.

Emissions and sinks from LULUCF are included in the totals.

Emissions from LULUCF in 2018 for non-CO2 gases were 0.034 MtCO2e CH4 and 1.393 MtCO2e for N2O.

There is a small residual (<0.2%) of total EU ETS emissions that we have not been able to allocate to a category, these are not included in the totals above.

Inventory estimates of CO2 emissions for 1A3a have been used instead of EU ETS aviation data, as the scope of EU ETS aviation data are not suitable for use here.

Iceland (submitted by country)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)

Year 2019
Submission 2021
Country Iceland
Geographical scope⁽⁴⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	CO ₂ equivalent (Gg)	
										ETS	non-ETS
CO₂ equivalent (kt)											
Total (net emissions)⁽¹⁾	9029.68	4178.48	288.57	207.04	88.70	1.99	NO	NO	13794.47		
1. Energy	1876.22	6.71	24.33						1907.26		
A. Fuel combustion (sectoral approach)	1713.11	2.93	24.33						1740.37		
1. Energy industries	5.06	0.01	0.01						5.07		
2. Manufacturing industries and construction	101.01	0.13	9.12						110.27	10.90	99.36
3. Transport	1021.21	1.42	8.01						1030.64		
4. Other sectors	584.14	1.38	7.18						592.69		
5. Other	1.69	0.0024	0.0045						1.70		
B. Fugitive emissions from fuels	163.11	3.78	0.00						166.89		
1. Solid fuels	NO	NO	NO						NO		
2. Oil and natural gas	163.11	3.78	0.00						166.89		
C. CO ₂ transport and storage	NO								NO		
2. Industrial processes and product use	1721.08	2.83	2.78	207.04	88.70	1.99	0.00	0.00	2024.430		
A. Mineral industry	10.01								10.01		
B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO		
C. Metal industry	1705.87	2.80	NO	NO	88.64	NO	NO	NO	1797.31	1796.16	1.15
D. Non-energy products from fuels and solvent use	5.18	NO,NE,NA	NO,NE,NA						5.18		
E. Electronic Industry				NO	NO	NO	NO	NO	NO		
F. Product uses as ODS substitutes				207.04	0.06	NO	NO	NO	207.11		
G. Other product manufacture and use	0.02	0.03	2.78	NO	NO	1.99	NO	NO	4.8197		
H. Other	NA	NA	NA						NA		
3. Agriculture	7.44	352.28	251.24						610.9541		
A. Enteric fermentation		296.71							296.71		
B. Manure management		55.57	19.00						74.57		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NA,NE,NO	232.24						232.24		
E. Prescribed burning of savannas			NO	NO					NO		
F. Field burning of agricultural residues			NO,NA	NO,NA					NO,NA		
G. Liming	3.89								3.89		
H. Urea application	1.93								1.93		
I. Other carbon-containing fertilizers	1.62								1.62		
J. Other	NO	NO	NO						NO		
4. Land use, land-use change and forestry⁽¹⁾	5411.55	3596.37	1.84						9009.76		
A. Forest land	-387.47	0.71	0.90						-385.86		
B. Cropland	1143.26	57.42	NO,NA						1200.68		
C. Grassland	5810.91	423.12	0.93						6234.96		
D. Wetlands	-1161.25	3115.12	NO,NE,NA						1953.87		
E. Settlements	6.26	NE	0.01						6.27		
F. Other land	NE,NA	NA	NA						NE,NA		
G. Harvested wood products	-0.15								-0.15		
H. Other	IE	IE	IE						IE		
5. Waste	13.40	220.29	8.38						242.065		
A. Solid waste disposal	NO	171.57							171.57		
B. Biological treatment of solid waste		2.38	1.70						4.09		
C. Incineration and open burning of waste	13.40	0.41	0.75						14.56		
D. Waste water treatment and discharge		45.92	5.93						51.85		
E. Other	NA	NO	NO						NO,NA		
6. Other (as specified in summary I.A)											
Memo items:⁽²⁾											
International bunkers	1143.12	0.60	9.45						1153.18		
Aviation	956.38	0.17	7.97						964.51		
Navigation	186.75	0.44	1.48						188.67		
Multilateral operations	NO	NO	NO						NO		
CO ₂ emissions from biomass	49.65								49.65		
CO ₂ captured	NO,NA								NO,NA		
Long-term storage of C in waste disposal sites	NO								NO		
Indirect N ₂ O			NE								
Indirect CO ₂ ⁽³⁾	NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry									4784.7116	1807.06	100.51
Total CO₂ equivalent emissions with land use, land-use change and forestry									13794.47		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA		

⁽¹⁾ For carbon dioxide (CO₂) 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 I.A.

⁽³⁾ In accordance with the UNFCCC Annex I inventory reporting guidelines, for Parties that decide to report indirect CO₂, the national totals shall be provided with and without indirect CO₂.

⁽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.

There are three key drivers causing the decrease of proxy emission data for 2019 compared to 2018:

- 1) Emissions from 2C Metal Industry included in ETS have decreased slightly
- 2) Emissions from 3 Agriculture have decreased mainly due to a decrease in number of animals
- 3) Emissions from 5A have decreased due to increased methane collection from landfills

Norway (submitted by country)

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)										Year	
										Submission	
										Country	
										Geographical scope ⁽⁴⁾	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
CO ₂ equivalent (kt)										CO ₂ equivalent (Gg)	
Total (net emissions)⁽¹⁾	42 199	4 590	2 417	844	188	57	NO	NO	NE	19 470	17 317
1. Energy	35 573	1 021	193						36 787	17 146	16 792
A. Fuel combustion (sectoral approach)	33 272	462	190						33 924	17 146	16 792
1. Energy industries	14 809	72	19						14 900	13 526	1 387
2. Manufacturing industries and construction	3 706	10	32						3 748	2 594	1 155
3. Transport	11 841	149	106						12 096	1 025	11 071
4. Other sectors	2 771	230	33						3 034	NO	3 034
5. Other	145	0	1						146	NO	146
B. Fugitive emissions from fuels	2 284	560	2						2 846	2 338	508
1. Solid fuels	9	59	-						68	NO	68
2. Oil and natural gas	2 275	500	2						2 778	2 338	440
C. CO ₂ transport and storage	17								17	NO	17
2. Industrial processes and product use	6 532	15	324	844	188	57	NO	NO	7 959	6 153	1 807
A. Mineral industry	989								989	954	36
B. Chemical industry	614	14	300	NO,NA	NO,NA	NO,NA	NO	NO	928	477	451
C. Metal industry	4 598	1	5	NO	188	NO	NO	NO	4 791	4 722	68
D. Non-energy products from fuels and solvent use	221	-	-						221	NO	221
E. Electronic industry				NO	0	-	NO	NO	0	NO	0
F. Product uses as ODS substitutes				844	NO	NO	NO	NO	844	NO	844
G. Other product manufacture and use	-	-	19	NO	NO	57	NO	NO	76	NO	76
H. Other	110	NO	NO	NO	NO	NO	NO	NO	110	NO	110
3. Agriculture	93	2 572	1 788						4 453		
A. Enteric fermentation		2 290	-						2 290		
B. Manure management		278	148						426		
C. Rice cultivation		NO							NO		
D. Agricultural soils		NE	1 639						1 639		
E. Prescribed burning of savannas		NO	NO						NO		
F. Field burning of agricultural residues		4	1						5		
G. Liming	93								93		
H. Urea application	0								0		
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	1	982	112						1 095		
A. Solid waste disposal	NO	875							875		
B. Biological treatment of solid waste		38	33						71		
C. Incineration and open burning of waste	1	0	0						1		
D. Waste water treatment and discharge		69	79						148		
E. Other	NO	NO	NO						NO		
6. Other (as specified in summary 1.A)	NO	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 ₂ O			NE								
Indirect CO ₂ ⁽³⁾	NE										
Total CO₂ equivalent emissions without land use, land-use change and forestry										50 294	
Total CO₂ equivalent emissions with land use, land-use change and forestry										NE	
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry										NE	
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										NE	
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										25 623	24 671
Memo items:⁽²⁾											
International bunkers											
Aviation											
Navigation											
Multilateral operations											
CO ₂ emissions from biomass											
CO ₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N ₂ O											
Indirect CO ₂ ⁽³⁾											
Total CO₂ equivalent emissions without land use, land-use change and forestry										50 294	
Total CO₂ equivalent emissions with land use, land-use change and forestry										NE	
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry										NE	
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry										NE	
Please note that LULUCF and memo items have not yet been estimated for 2019. These figures will be available in november 2020											
Total CO ₂ -eq emissions without LULUCF was estimated to have decreased by 1.7 million tonnes (3.4 per cent) from 2018 to 2019. This is mainly due to lower emissions from transport, both road traffic and other transport (aviation, navigation and fisheries, and other). Reduced emissions from road traffic is a result of lower consumption of fuels in combination with increased consumption of biofuels.											
Description of emissions in 2019, published by Statistics Norway (only available in Norwegian): https://www.ssb.no/natur-og-miljo/artikler-og-publikasjoner/nedgang-i-klimagassutslippene--423304											

⁽¹⁾ For carbon dioxide (CO₂) 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 CO₂ the national totals shall be provided with and without indirect CO₂.

⁽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 description of the key drivers underpinning the increase or decrease in GHG emissions in 2019 compared to 2018 (inventory) in this information pathway.

Switzerland (submitted by country)

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS										Year	
(Sheet 1 of 1)										2019	
										Submission	
										July 2020	
										Country	
										Switzerland	
										Geographical scope ⁽⁴⁾	
										Switzerland	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
CO ₂ equivalent (kt)										CO ₂ equivalent (Gg)	
Total (net emissions)⁽¹⁾	36729.76	4758.36	2929.49	1446.00	36.00	131.50	0.00	0.50	46031.61		
1. Energy	34555.10	270.65	250.39						35076.14	NE	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	2107.50	2.77	685.72	1446.00	36.00	131.50	NO	0.50	4409.98	NE	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	45.50	3978.55	1852.81						5876.86		
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	9.35	505.73	140.02						655.11		
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)	12.31	0.65	0.55	NO	NO	NO	NO	NO	13.52	NE	NE
Memo items:⁽²⁾											
International bunkers	NE	NE	NE						NE		
Aviation											
Navigation											
Multilateral operations	NO	NO	NO						NO		
CO₂ emissions from biomass	NE										
CO₂ captured	NO										
Long-term storage of C in waste disposal sites	NE										
Indirect N₂O			253.08								
Indirect CO₂⁽³⁾	98.93										
Total CO₂ equivalent emissions without land use, land-use change and forestry									46031.61	NE	NE
Total CO₂ equivalent emissions with land use, land-use change and forestry									NE		
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									46130.54		
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NE		

(1) For carbon dioxide (CO₂) 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 CO₂, the national totals shall be provided with and without indirect CO₂.

(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.

Indirect CO2 emissions from sector 6 account for 1.13 kt (and are included in the 98.93 kt indicated above as total indirect CO2 emissions).

Note, indirect N2O emissions are estimated but are not included in the Swiss Kyoto target.

Total approximated CO2 equivalent emissions in 2019 according to the Swiss Kyoto target are 46'115.89 kt.

Swiss climate reporting under the UNFCCC:

<http://www.climate reporting.ch>

In the different sectors, emission changes from 2018 to 2019 were mainly caused by the following drivers:

Sector 1 'Energy'

Slightly lower Fuel Combustion (1A) due to efficiency improvements and increasing usage of renewable energy for heating in 1A4bi Stationary Combustion.

Sector 2 'Industrial processes and product use'

Slightly decreased CO2 emissions from cement production (based on data from cement plants).

Sector 3 'Agriculture'

The approximated emission estimate considered aggregated animal numbers, updated milk production, and estimates on mineral fertilizers.

Sector 5 'Waste'

Reduced emissions of CH4 from waste disposal sites (based on model simulations, disposal of burnable solid waste is prohibited since the year 2000).

Turkey (submitted by country)

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Year
Submission
Country
Geographical scope⁽⁵⁾

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	ETS	non-ETS
Total (net emissions)⁽¹⁾											
1. Energy											
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											
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											
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⁾											
A. Forest land	-75628.10	1.93	0.11						-75547.07		
B. Cropland	367.51										
C. Grassland	757.31										
D. Wetlands	185.24										
E. Settlements	413.12										
F. Other land	657.21										
G. Harvested wood products											
H. Other											
5. Waste											
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)											
Memo items:⁽²⁾											
International bunkers											
Aviation											
Navigation											
Multilateral operations											
CO₂ emissions from biomass											
CO₂ captured											
Long-term storage of C in waste disposal sites											
Indirect N₂O											
Indirect CO₂⁽³⁾											
Total CO ₂ equivalent emissions without land use, land-use change and forestry											
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											

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 The EEA has 33 member countries: the 28 European Union Member States together with Iceland, Liechtenstein, Norway, Switzerland and Turkey
ESD	Effort Sharing Decision
ETC/ACM	European Topic Centre on Air Pollution and Climate Change Mitigation
ETC/CME	European Topic Centre for Climate Change Mitigation and Energy
ETS	Emissions Trading System
EU	European Union
EU27+UK	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, Sweden and the United Kingdom
EU-KP	"EU-KP" refers to the EU27+UK plus Iceland.
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) 525/2013)
Mt	Megatons (million tons)
N ₂ O	Nitrous oxide
NF ₃	Nitrogen trifluoride
ODS	Ozone-depleting substance
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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