



30 June 2021

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention

Note by the secretariat

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I. Mandate

1. The Conference of the Parties (COP), by its decision 13/CP.20, adopted the revised guidelines for the technical review of greenhouse gas (GHG) inventories from Parties included in Annex I to the Convention (Annex I Parties). As part of the process for the technical review of GHG inventories, the COP requested the secretariat to compile and tabulate aggregate information on greenhouse gas emissions by sources and removals by sinks and trends from the latest available GHG inventory submissions of Annex I Parties and publish this information in a stand-alone document.¹
2. Pursuant to decision 4/CMP.11, the initial check and the scope of the individual review shall be conducted consistent with the initial assessment and apply the relevant provisions for the review contained in decision 13/CP.20.
3. The COP, by its decision 24/CP.19, adopted the revised “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories” (hereinafter referred to as the UNFCCC reporting guidelines) and a revised set of common reporting format (CRF) tables² to be used by Annex I Parties to report quantitative GHG inventory data. Similarly, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), by decision 6/CMP.9, adopted the revised CRF tables³ that Parties shall use for reporting information on anthropogenic greenhouse gas emissions by sources and removals by sinks from land use, land-use change and forestry (LULUCF) activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in the second commitment period.⁴

II. Comparison of greenhouse gas inventory information

A. Approach

4. This document contains GHG inventory information compiled in tabular format. The tables provide information on emissions by sources and removals by sinks, implied emission factors (IEFs), and activity data (AD) reported by Annex I Parties. In addition, the tables contain information on the methods and emission factors used, activity data from international sources and other information relating to GHG inventory estimates. This information is provided for both the base year/period and for the year 2019.
5. Where it has been submitted, this document also contain inventory information on anthropogenic GHG emissions by sources and removals by sinks from LULUCF activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol, reported in accordance with decision 15/CMP.1, in conjunction with decision 3/CMP.11.
6. The information provided in this document is based on information in the CRF tables of the 2021 national GHG inventories received from Parties as at 27 May 2021.

¹ Decision 13/CP.20, paragraph 8.

² The tables, agreed in decision 24/CP.19, can be accessed here: <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/application/octet-stream/2006_ipcc_guidelines.7z>.

³ The tables, agreed in decision 6/CMP.9, can be accessed here: <<https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-kyoto-protocol/overview/initial-reports-under-the-kyoto-protocol-parties-included-in-annex-i/implications-of-the-implementation-of-decisions-2/cmp7-to-4/cmp7-and-1/cmp8-on-the-previous>>.

⁴ The Doha amendment entered into force on 31 December 2020.

7. The GHG inventory data is presented according to the sectors, subsectors and categories specified in the CRF tables.
8. As at 27 May 2021, 44 Parties had submitted their CRF tables, including Kazakhstan, which is an Annex I Party for the purposes of the Kyoto Protocol, while remaining a Party not included in Annex I to the Convention for the purposes of the Convention.
9. Four Parties, Denmark, the European Union, France and the United Kingdom of Great Britain and Northern Ireland, provided more than one set of CRF tables in order to address the different geographical areas used for reporting under the Convention and under the Kyoto Protocol. For the purposes of this document, the following naming conventions are used to identify inventory submissions under the Convention: Denmark (Convention), covering the Kingdom of Denmark (Denmark mainland, Greenland and Faroe Islands); European Union (Convention), covering its 28 member States; France (Convention) covering metropolitan France, the French Overseas Departments, the French Overseas Collectivities and New Caledonia; and United Kingdom of Great Britain and Northern Ireland (Convention), covering United Kingdom, the Crown Dependencies, Bermuda, Cayman Islands, Falkland Islands and Gibraltar. The following naming conventions are used to identify inventory submissions under the Kyoto Protocol: Denmark (KP), covering Denmark mainland; European Union (KP), covering its 28 member States and Iceland; France (KP), covering metropolitan France and the French Overseas Departments (including Mayotte); and United Kingdom of Great Britain and Northern Ireland (KP), covering United Kingdom, the Crown Dependencies, Cayman Islands, Falkland Islands and Gibraltar.
10. The information contained in this report is not intended as a judgment of whether inventory problems exist, but as an indication of potential issues that need to be considered further during the individual review by the expert review team.

B. Explanatory notes to the tables

11. Blank cells in a table indicate that a Party did not report information for a given category, gas, AD or other parameter. Where a Party's value is very small compared with that of other Parties, it has been rounded to zero (0.00 or 0.000). Where a Party reports a zero numerical value, a zero value (0) is shown.
12. In tables where shares or contributions of categories, gases, AD or other parameters to a total are shown (e.g. contribution of specific fuel type to the total emissions of a combustion category), where a Party reports a notation key, zero value (0) or blank in either the numerator or denominator of the calculation, the share or contribution to the total is shown using the symbol “—”.
13. The differences in AD between the values reported by Parties and international data sources were calculated as percentage deviations from the AD provided by the Party. A positive number indicates that the data from the international data source are higher than the data reported by the Party. Similarly, a negative number indicates that data from the international data source are lower than the data reported by the Party.
14. References to the base year pertain to 1990, except for the following Parties which, in accordance with decisions 9/CP.2 and 11/CP.4, use base years other than 1990: Bulgaria (1988), Hungary (average 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).
15. The column “Share of national total” in the tables indicates the contribution of that category to the Party's national total of GHG emissions in terms of carbon dioxide equivalent, without emissions and removals from LULUCF, but including indirect CO₂ emissions where reported.

16. Where Parties used notation keys “NO”, “NE”, “NA”, “IE” or “C”, these have been reproduced verbatim from the CRF tables provided by Parties. The notation keys, as described in the UNFCCC reporting guidelines, are as follows:

NO	Not occurring	IE	Included elsewhere
NE	Not estimated	C	Confidential
NA	Not applicable		

17. Where Parties used notation keys “R”, “NO”, “NR” or “IE”, these have been reproduced verbatim from the tables provided by Parties. The notations keys, as described in the tables referred to in decision 6/CMP.9, are as follows:

R	Reported	NR	Not reported
NO	Not occurring	IE	Included elsewhere

18. Tables on energy indicate whether IEFs given in the CRF tables are based on gross calorific value (GCV) or net calorific value (NCV). Australia, Canada, Japan, New Zealand and United States of America reported energy data on a GCV basis, whilst Denmark reported using a combination of GCV and NCV. Hence, reported IEFs are about 5 per cent lower for liquid, solid and other fuels, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.

19. The following chemical formulae or abbreviations for GHGs are used in this document:

C	carbon
CH ₄	methane
CO ₂	carbon dioxide
HFCs	hydrofluorocarbons
N ₂ O	nitrous oxide
NF ₃	nitrogen trifluoride
NMVOC	non-methane volatile organic compound
PFCs	perfluorocarbons
SF ₆	sulphur hexafluoride

20. To indicate the methods and emission factors used by Parties, the following abbreviations have been used (see also footnotes to Summary table 3 of the CRF) in this document:

<u>Methods:</u>		<u>Emission factors:</u>	
D	IPCC default	D	IPCC default
RA	Reference approach	CR	CORINAIR
T1	IPCC tier 1	CS	Country specific
T1a	IPCC tier 1a	PS	Plant specific
T1b	IPCC tier 1b	M	Model
T1c	IPCC tier 1c	OTH	Other
T2	IPCC tier 2		
T3	IPCC tier 3		

CR	CORINAIR
CS	Country specific
M	Model
OTH	Other

21. The following units have been used in this document:

kg	kilogram (10^3 grams)
kt	kilotonne (10^9 grams)
Mg	megagram (10^6 grams) – same as tonne
t	tonne (10^6 grams)
Mt	megatonne (10^{12} grams)
TJ	terajoule (10^{12} joules)
PJ	petajoule (10^{15} joules)
km	kilometre
ha	hectare
kha	thousand hectares
m ³	cubic metre

22. The following abbreviations have been used in this document:

AB	area burned
AD	activity data
BB	biomass burned
CO	carbon monoxide
CRF	common reporting format
CSC	carbon stock change
dm	dry matter
DOM	dead organic matter
EF	emission factor
FAO	Food and Agriculture Organization of the United Nations
GCV	gross calorific value
GHG	greenhouse gas
IEA	International Energy Agency
IEF	implied emission factor
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
N	nitrogen
NCV	net calorific value
NIR	national inventory report

NM VOC	non-methane volatile organic compounds
NO _x	nitrogen oxides
yr	year

C. List of sectoral figures and tables with information submitted under decision 24/CP.19

1. General

<u>Figure number</u>	<u>Figure name</u>
Figure G.1	GHG emissions by gas (with LULUCF): base year and 2019
Figure G.2	GHG emissions by gas (without LULUCF): base year and 2019
Figure G.3	GHG emissions by sector (without LULUCF): base year and 2019
<u>Table number</u>	<u>Table name</u>
Table G.1	Submissions used in this report

2. Energy

<u>Figure number</u>	<u>Figure name</u>
Figure 1.1	Contribution of subsectors to total GHG emissions in the Energy sector
<u>Table number</u>	<u>Table name</u>
Table 1.1	CO ₂ emissions from fuel combustion: reference approach and sectoral approach
Table 1.2	Stationary combustion: liquid fuels – CO ₂ (2019)
Table 1.3	Stationary combustion: solid fuels – CO ₂ (2019)
Table 1.4	Stationary combustion: gaseous fuels – CO ₂ (2019)
Table 1.5	Stationary combustion: other fossil fuels – CO ₂ (2019)
Table 1.6	Road transportation – CO ₂ , N ₂ O (2019)
Table 1.7	Domestic aviation and navigation – CO ₂ (2019)
Table 1.8	Domestic and international aviation – activity data (2019)
Table 1.9	Domestic and international navigation – activity data (2019)
Table 1.10	Fugitive emissions from fuels: coal mining and handling – CH ₄ (2019)
Table 1.11a	Fugitive emissions from fuels: oil and natural gas – CH ₄ , CO ₂ (2019)
Table 1.11b	Fugitive emissions from fuels: oil and natural gas – oil – CH ₄ , CO ₂ (2019)
Table 1.11c	Fugitive emissions from fuels: oil and natural gas – natural gas – CH ₄ , CO ₂ (2019)
Table 1.11d	Fugitive emissions from fuels: oil and natural gas – venting and flaring – CH ₄ , CO ₂ (2019)
Table 1.12	CO ₂ transport and storage (2019)

3. Industrial processes and product use

<u>Figure number</u>	<u>Figure name</u>
Figure 2.1	Contribution of subsectors to total GHG emissions in the Industrial processes and product use sector

<u>Table number</u>	<u>Table name</u>
Table 2.1	Mineral industry – CO ₂ (2019)
Table 2.2	Chemical industry – CO ₂ and N ₂ O (2019)
Table 2.3	Metal industry – CO ₂ (2019)
Table 2.4	HFCs, PFCs, SF ₆ and NF ₃ (2019)

4. Agriculture

<u>Figure number</u>	<u>Figure name</u>
Figure 3.1	Contribution of subsectors to total GHG emissions in the Agriculture sector

<u>Table number</u>	<u>Table name</u>
Table 3.1	Enteric fermentation – CH ₄ (2019)
Table 3.2	Manure management – CH ₄ (2019)
Table 3.3	Manure management – N ₂ O (2019)
Table 3.4	Agricultural soils – N ₂ O (2019)

5. Land use, land-use change and forestry

<u>Table number</u>	<u>Table name</u>
Table 4.1a–b	Methods and emission factors used (2019)
Table 4.2	Forest land – AD, IEFs, carbon stock changes in pools and net CO ₂ emissions/removals (2019)
Table 4.3	Cropland – AD, IEFs, carbon stock changes in pools and net CO ₂ emissions/removals (2019)
Table 4.4	Grassland – AD, IEFs, carbon stock changes in pools and net CO ₂ emissions/removals (2019)
Table 4.5	Land area (2019)

6. Waste

<u>Figure number</u>	<u>Figure name</u>
Figure 5.1	Contribution of subsectors to total GHG emissions in the Waste sector
<u>Table number</u>	<u>Table name</u>
Table 5.1a–b	Solid waste disposal on land, biological treatment of solid waste, incineration and open burning of waste and wastewater treatment and discharge (2019)

D. List of tables with information submitted under Article 7, paragraph 1, of the Kyoto Protocol in accordance with decisions 15/CMP.1, in conjunction with 3/CMP.11, and 6/CMP.9

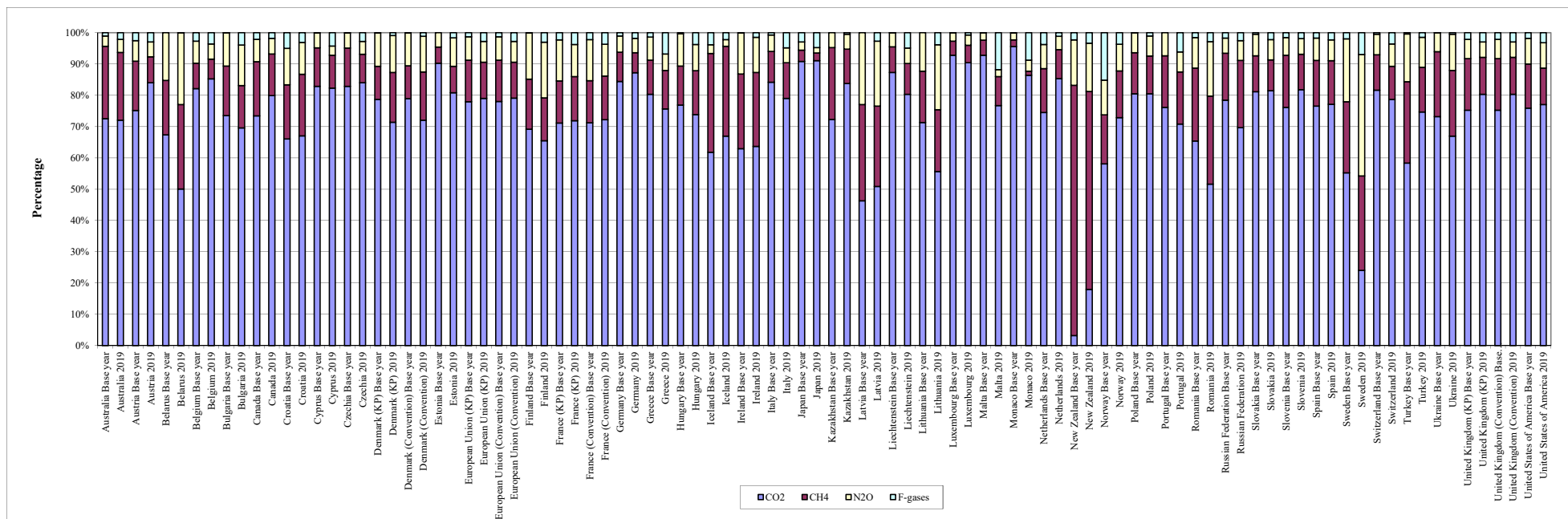
Supplementary information for land use, land-use change and forestry activities under the Kyoto Protocol

<u>Table number</u>	<u>Table name</u>
Table 6.1	Selected values (forest parameters), elected activities under Article 3.4, accounting period, forest management cap
Table 6.2(a)-(d)	Activity coverage in the reporting of information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4
Table 6.3(a)	Afforestation and reforestation - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(b)	Deforestation - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(c)	Forest management - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(d)	Cropland management - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(e)	Cropland management - area and implied carbon stock change factors from the change in carbon stocks for the base year
Table 6.3(f)	Grazing land management - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(g)	Grazing land management - area and implied carbon stock change factors from the change in carbon stocks for the base year
Table 6.3(h)	Revegetation - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(i)	Revegetation - area and implied carbon stock change factors from the change in carbon stocks for the base year
Table 6.3(j)	Wetland drainage and rewetting - area and implied carbon stock change factors from the change in carbon stocks for 2019
Table 6.3(k)	Wetland drainage and rewetting - area and implied carbon stock change factors from the change in carbon stocks for the base year
Table 6.4	Direct and indirect N ₂ O emissions from N fertilization for 2019
Table 6.5	CH ₄ and N ₂ O emissions from drained and rewetted organic soils for 2019
Table 6.6	N ₂ O emissions from N mineralization/immobilization due to carbon loss/gain associated with land-use conversions and management change in mineral soils for 2019
Table 6.7(a)	Emissions from biomass burning 2019
Table 6.7(b)	Emissions from biomass burning on cropland management land
Table 6.7(c)	Emissions from biomass burning on grazing land management land

Table 6.7(d)	Emissions from biomass burning on revegetation land
Table 6.7(e)	Emissions from biomass burning on wetland drainage and rewetting land

Figure G.1

GHG emissions by gas^a (with LULUCF): base year^b and 2019

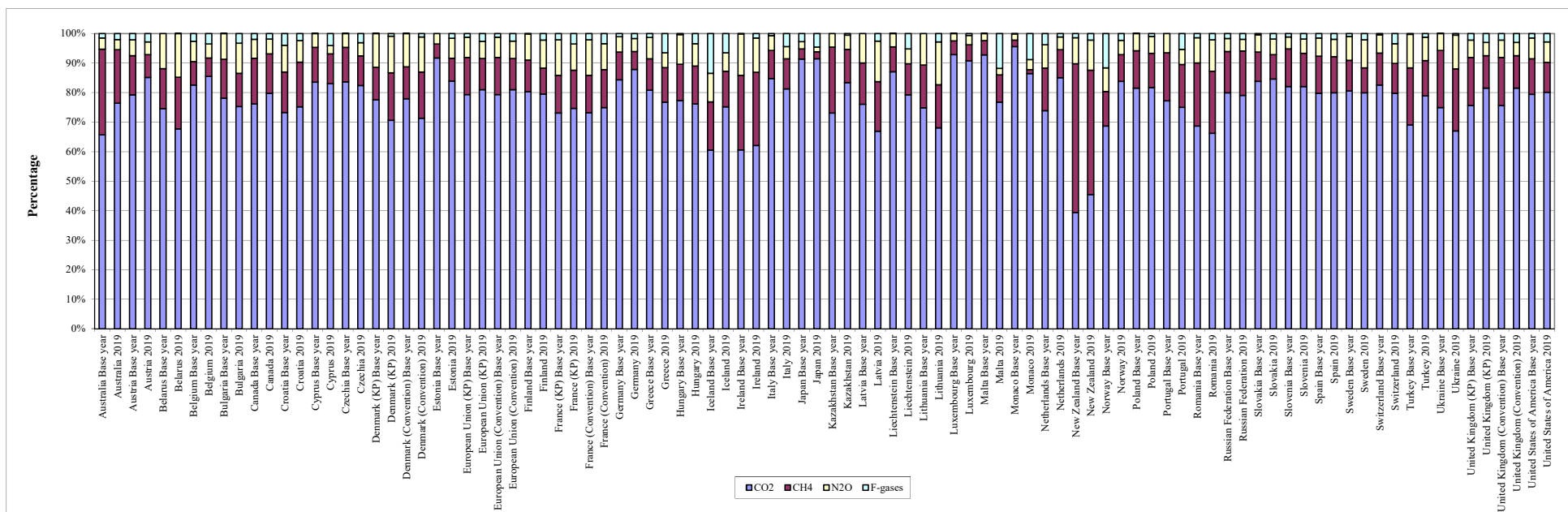


^a The national totals and emissions by CO₂ in this graph include indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

Figure G.2

GHG emissions by gas^a (without LULUCF): base year^b and 2019

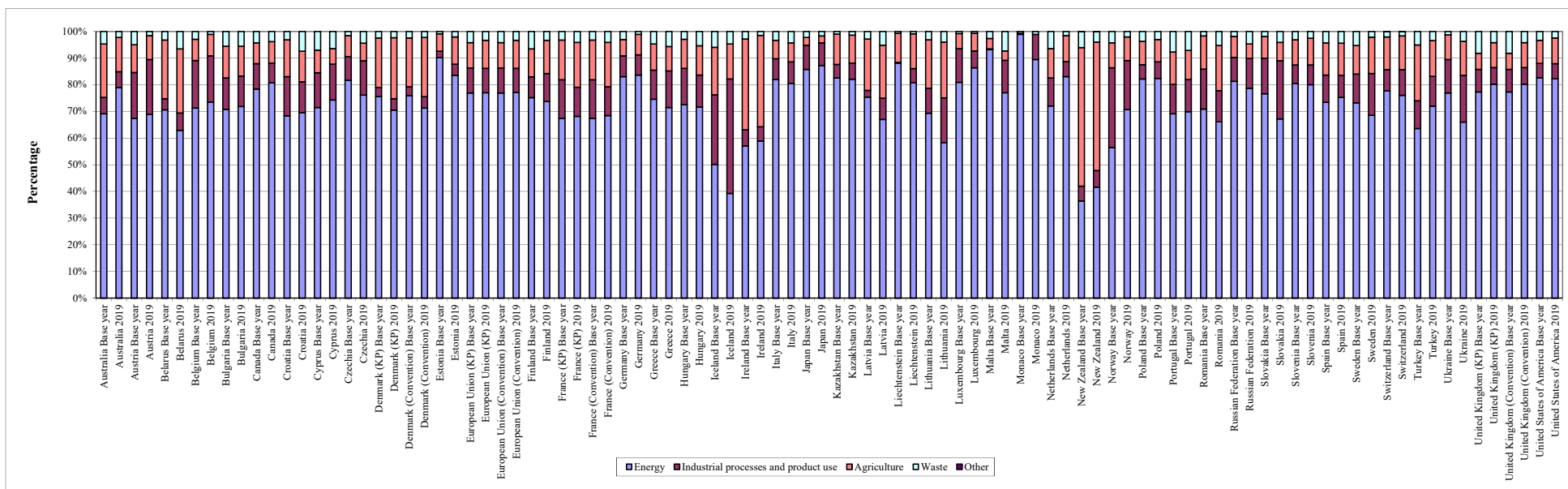


^a The national totals and emissions by CO₂ in this graph include indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

Figure G.3

GHG emissions^a by sector (without LULUCF): base year^b and 2019



^a The national totals and emissions by CO₂ in this graph include indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

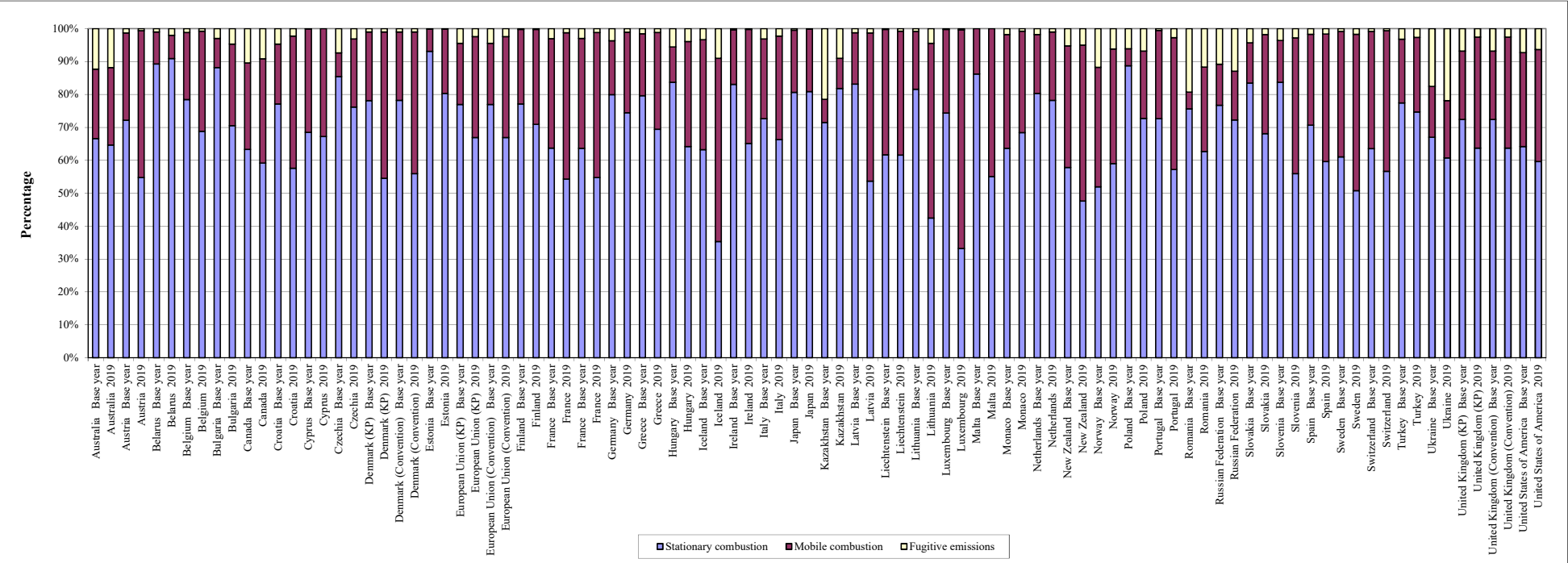
Table G.1**Submissions used in this report**

Party	Initial submission date	CRF for years	NIR	CRF submission date and version used in this report	CRF Reporter version (version used in this report)	CRF KP LULUCF ^a submission date and version used in this report	CRF KP LULUCF ^a Reporter version (version used in this report)
Australia	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Austria	15 April 2021	1990-2019	15 April 2021	15 April 2021 (2)	6.0.8	15 April 2021 (2)	6.0.8
Belarus	14 April 2021	1990-2019	19 April 2021	14 April 2021 (2)	6.0.8	NA	NA
Belgium	14 April 2021	1990-2019	14 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Bulgaria	15 April 2021	1988-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Canada	12 April 2021	1990-2019	12 April 2021	12 April 2021 (1)	6.0.8	NA	NA
Croatia	14 April 2021	1990-2019	14 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Cyprus	9 April 2021	1990-2019	13 April 2021	09 April 2021 (2)	6.0.8	09 April 2021 (2)	6.0.8
Czechia	14 April 2021	1990-2019	14 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Denmark (KP)	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Denmark (Convention)	15 April 2021	1990-2019	15 April 2021	15 April 2021 (2)	6.0.8	NA	NA
Estonia	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
European Union (KP)	14 April 2021	1990-2019	27 May 2021	27 May 2021 (2)	6.0.8	27 May 2021 (2)	6.0.8
European Union (Convention)	14 April 2021	1990-2019	27 May 2021	27 May 2021 (2)	6.0.8	NA	NA
Finland	13 April 2021	1990-2019	14 April 2021	13 April 2021 (3)	6.0.8	13 April 2021 (3)	6.0.8
France (KP)	21 April 2021	1990-2019	13 April 2021	21 April 2021 (1)	6.0.8	21 April 2021 (1)	6.0.8
France (Convention)	15 April 2021	1990-2019	13 April 2021	15 April 2021 (2)	6.0.8	NA	NA
Germany	14 April 2021	1990-2019	15 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Greece	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Hungary	15 April 2021	1985-87, 1986-2019	15 April 2021	15 April 2021 (2)	6.0.8	15 April 2021 (2)	6.0.8
Iceland	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Ireland	13 April 2021	1990-2019	13 April 2021	13 April 2021 (1)	6.0.8	13 April 2021 (1)	6.0.8
Italy	12 April 2021	1990-2019	12 April 2021	12 April 2021 (1)	6.0.8	12 April 2021 (1)	6.0.8
Japan	13 April 2021	1990-2019	13 April 2021	13 April 2021 (1)	6.0.8	13 April 2021 (1)	6.0.8
Kazakhstan	16 April 2021	1990-2019	28 May 2021	16 April 2021 (1)	6.0.8	16 April 2021 (1)	6.0.8
Latvia	13 April 2021	1990-2019	13 April 2021	13 April 2021 (2)	6.0.8	13 April 2021 (2)	6.0.8
Liechtenstein	14 April 2021	1990-2019	15 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Lithuania	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Luxembourg	13 April 2021	1990-2019	14 April 2021	13 April 2021 (1)	6.0.8	13 April 2021 (1)	6.0.8
Malta	15 April 2021	1990-2019	15 April 2021	15 April 2021 (2)	6.0.8	15 April 2021 (2)	6.0.8
Monaco	14 April 2021	1990-2019	13 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Netherlands	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
New Zealand	14 April 2021	1990-2019	15 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Norway	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Poland	14 April 2021	1988-2019	27 May 2021	27 May 2021 (3)	6.0.8	27 May 2021 (3)	6.0.8
Portugal	13 April 2021	1990-2019	13 April 2021	13 April 2021 (1)	6.0.8	13 April 2021 (1)	6.0.8
Romania	13 April 2021	1989-2019	29 April 2021	27 May 2021 (6)	6.0.8	27 May 2021 (6)	6.0.8
Russian Federation	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
Slovakia	14 April 2021	1990-2019	15 April 2021	14 April 2021 (4)	6.0.8	14 April 2021 (4)	6.0.8
Slovenia	12 April 2021	1986-2019	15 April 2021	12 April 2021 (3)	6.0.8	12 April 2021 (3)	6.0.8
Spain	15 March 2021	1990-2019	07 May 2021	15 March 2021 (1)	6.0.8	15 March 2021 (1)	6.0.8
Sweden	14 April 2021	1990-2019	14 April 2021	14 April 2021 (1)	6.0.8	14 April 2021 (1)	6.0.8
Switzerland	12 April 2021	1990-2019	12 April 2021	12 April 2021 (1)	6.0.8	12 April 2021 (1)	6.0.8
Turkey	13 April 2021	1990-2019	13 April 2021	13 April 2021 (1)	6.0.8	NA	NA
Ukraine	15 April 2021	1990-2019	23 April 2021	15 April 2021 (1)	6.0.8	15 April 2021 (1)	6.0.8
United Kingdom of Great Britain and Northern Ireland (KP)	15 April 2021	1990-2019	15 April 2021	15 April 2021 (3)	6.0.8	15 April 2021 (3)	6.0.8
United Kingdom of Great Britain and Northern Ireland (Convention)	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	NA	NA
United States of America	15 April 2021	1990-2019	15 April 2021	15 April 2021 (1)	6.0.8	NA	NA

^a The tables of the common reporting format for the purpose of submission of information on anthropogenic greenhouse gas emissions by sources and removals by sinks from LULUCF activities under Article 3, paragraph 3, forest management, and, if any, elected activities under Article 3, paragraph 4, in accordance with Article 5, paragraph 2, of the Kyoto Protocol. These tables are contained in the annex to decision 6/CMP.9.

Figure 1.1

Contribution of subsectors to total GHG emissions in the Energy sector^{a, b}



^aIn accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

^bIndirect CO₂ emissions are excluded from the totals in this graph.

Table 1.1**CO₂ emissions from fuel combustion: reference approach and sectoral approach^a**

	Reference approach	Sectoral approach	Difference
	(kt CO ₂)		(%)
Australia Base year	254 499	251 676	1.12
Australia 2019	379 440	374 299	1.37
Austria Base year	51 648	51 058	1.15
Austria 2019	54 115	53 722	0.73
Belarus Base year	127 597	96 116	32.75
Belarus 2019	71 023	55 214	28.63
Belgium Base year	91 858	101 542	-9.54
Belgium 2019	78 987	83 953	-5.92
Bulgaria Base year ^b	84 385	77 902	8.32
Bulgaria 2019	40 055	37 625	6.46
Canada Base year	419 240	411 271	1.94
Canada 2019	513 087	523 806	-2.05
Croatia Base year ^b	20 165	19 780	1.94
Croatia 2019	15 919	15 477	2.86
Cyprus Base year	4 281	3 931	8.90
Cyprus 2019	6 324	6 522	-3.02
Czechia Base year	150 039	146 782	2.22
Czechia 2019	87 913	89 036	-1.26
Denmark Base year (KP)	51 149	51 314	-0.32
Denmark 2019 (KP)	28 720	29 084	-1.25
Denmark Base year (Convention)	51 780	52 604	-1.57
Denmark 2019 (Convention)	29 282	30 722	-4.69
Estonia Base year	36 910	36 677	0.64
Estonia 2019	17 846	11 976	49.01
European Union (KP) Base year	3 990 363	4 100 731	-2.69
European Union (KP) 2019	2 962 267	3 003 092	-1.36
European Union (Convention) Base year	3 988 420	4 096 886	-2.65
European Union (Convention) 2019	2 960 593	2 998 873	-1.28
Finland Base year	52 654	52 527	0.24
Finland 2019	38 222	38 144	0.20
France Base year (KP)	351 836	346 362	1.58
France 2019 (KP)	290 025	288 621	0.49
France Base year (Convention)	352 281	348 652	1.04
France 2019 (Convention)	293 723	294 916	-0.40
Germany Base year	987 396	985 750	0.17
Germany 2019	658 069	660 687	-0.40
Greece Base year	74 770	74 622	0.20
Greece 2019	58 435	59 751	-2.20
Hungary Base year ^b	74 245	74 187	0.08
Hungary 2019	43 752	43 527	0.52
Iceland Base year	1 761	1 752	0.53
Iceland 2019	1 716	1 661	3.31
Ireland Base year	30 146	30 148	-0.01
Ireland 2019	35 040	34 584	1.32
Italy Base year	396 451	405 145	-2.15
Italy 2019	312 312	321 589	-2.88
Japan Base year	1 070 635	1 078 636	-0.74
Japan 2019	1 051 636	1 047 757	0.37
Kazakhstan Base year	267 943	246 265	8.80
Kazakhstan 2019	258 163	261 567	-1.30
Latvia Base year	18 953	18 645	1.65
Latvia 2019	6 904	6 976	-1.03
Liechtenstein Base year	199	199	0.01
Liechtenstein 2019	151	148	2.11
Lithuania Base year	32 518	32 219	0.93
Lithuania 2019	11 283	11 007	2.52
Luxembourg Base year	10 194	10 219	-0.24
Luxembourg 2019	9 112	9 139	-0.29

Table 1.1**CO₂ emissions from fuel combustion: reference approach and sectoral approach^a**

	Reference approach	Sectoral approach	Difference
	(kt CO ₂)		(%)
Malta Base year	1 598	2 403	-33.50
Malta 2019	1 654	1 664	-0.60
Monaco Base year	97	98	-1.15
Monaco 2019	71	71	-0.30
Netherlands Base year	153 002	154 482	-0.96
Netherlands 2019	146 653	146 052	0.41
New Zealand Base year	19 380	22 110	-12.35
New Zealand 2019	31 348	32 179	-2.58
Norway Base year	25 496	24 957	2.16
Norway 2019	31 763	32 630	-2.66
Poland Base year^b	481 154	438 905	9.63
Poland 2019	296 868	294 197	0.91
Portugal Base year	39 652	39 396	0.65
Portugal 2019	42 631	42 301	0.78
Romania Base year^b	183 307	174 075	5.30
Romania 2019	72 130	63 470	13.64
Russian Federation Base year	2 362 968	2 264 027	4.37
Russian Federation 2019	1 479 554	1 442 826	2.55
Slovakia Base year	52 455	53 156	-1.32
Slovakia 2019	25 900	25 883	0.07
Slovenia Base year^b	15 571	15 506	0.42
Slovenia 2019	13 027	12 994	0.26
Spain Base year	216 729	206 805	4.80
Spain 2019	225 595	228 628	-1.33
Sweden Base year	47 697	50 809	-6.12
Sweden 2019	31 327	33 491	-6.46
Switzerland Base year	41 198	40 873	0.79
Switzerland 2019	34 642	34 534	0.31
Turkey Base year	135 417	129 662	4.44
Turkey 2019	369 249	348 884	5.84
Ukraine Base year	608 895	588 769	3.42
Ukraine 2019	166 509	168 936	-1.44
United Kingdom of Great Britain and Northern Ireland (KP) Base year	547 114	565 561	-3.26
United Kingdom of Great Britain and Northern Ireland (KP) 2019	338 968	349 235	-2.94
United Kingdom of Great Britain and Northern Ireland (Convention) Base year	547 892	566 269	-3.25
United Kingdom of Great Britain and Northern Ireland (Convention) 2019	339 686	349 955	-2.93
United States of America Base year	4 811 452	4 852 294	-0.84
United States of America 2019	5 003 026	4 996 935	0.12

^a Indirect CO₂ emissions are excluded from the totals in this table.

^b In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

Table 1.2
Stationary combustion: liquid fuels - CO₂ (2019)

	Share of national total ^a	IEF in CRF based on GCV or NCV ^b	Energy industries					Manufacturing industries and construction			Other sectors							Other		
			Methods and EF used ^c		CO ₂ IEF			Methods and EF used ^d		CO ₂ IEF	Methods and EF used ^e		CO ₂ IEF					Methods and EF used ^f		CO ₂ IEF
			Methods	EF	Total	Public electricity and heat production	Petroleum refining	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial / Institutional	Residential	Agriculture / Forestry / Fishing	Methods	EF	Stationary
					(tTJ)						(tTJ)									(tTJ)
Australia	7.65	GCV	T2	CS, PS	68	70	62	70	T2	CS	69	T2, T3	CS	68	69	62	70	T1, T3	CS	NO
Austria	10.33	NCV	T1, T2	CS, D	75	77	75	NO	T1, T2, T3	CS, D	73	D, T1, T2, T3	CS, D	75	74	75	74	T1, T2	CS, D	NO
Belarus	16.38	NCV	T1, T2	CS, D	67	67	IE, NO	IE, NO	T1, T2	CS, D	66	T1, T2	CS, D	72	74	71	74	T1, T2	CS, D	71
Belgium	12.59	NCV	CS, T1, T3	D, PS	64	69	64	NO	CS, T1, T3	D, PS	75	CS, T1, T3	D	74	74	74	74	CS, T1, T3	D	NO
Bulgaria	5.54	NCV	T1, T2	CS, D	59	77	58	69	T1, T2	CS, D	85	T1, T2	CS, D	72	70	63	74	T1	D	NO
Canada	10.69	GCV	T2	CS	58	76	55	57	T1, T2, T3	CS	70	T1, T2, T3	CS	68	66	68	70	T2, T3	CS	NO
Croatia	10.84	NCV	T1, T2	CS, D	67	75	67	NO	T1	D	83	T1	D	72	70	69	74			NO
Cyprus	47.45	NCV	CS, T1	CS, D	78	78	NO	NO	CS, T1	CS, D	81	T1	D	70	69	70	73	T1	D	72
Czechia	1.63	NCV	T1, T2	CS, D	57	62	55	74	T1, T2	CS, D	72	T1, T2	CS, D	73	69	66	74	T1	D	NO
Denmark (KP)	10.21	NCV	T1, T2, T3	CS, D, PS	59	76	57	74	CR, M, T1, T2, T3	CS, D, PS	82	CR, M, T1, T2, T3	CS, D	73	73	72	74	CR, M, T2	CS	NO
Denmark (Convention)	12.65	NCV	CS, T1, T2, T3	CS, D, PS	61	77	57	73	CR, M, T1, T2, T3	CS, D, PS	81	CR, M, T1, T2, T3	CS, D	74	73	73	74	CR, M, T1, T2	CS, D	NO
Estonia	4.64	NCV	T1, T2, T3	CS, D, PS	75	75	NO	IE, NO	T1, T2, T3	CS, D, PS	73	T1, T2	CS, D	73	74	67	73			NO
European Union (KP)	10.11				67	75	65	71			74			73	73	72	74			73
European Union (Convention)	10.08				67	75	65	71			74			73	73	72	74			73
Finland	17.04	NCV	T3	CS, D, PS	57	70	52	NO	T3	CS, D, PS	68	T1, T2, T3	CS, D	73	74	73	73	T2	CS	71
France (KP)	11.71	NCV	T2, T3	CS, PS	64	76	57	NO	T2, T3	CS, PS	76	T1, T2	CS, D	73	73	72	73			74
France (Convention)	12.11	NCV	T2, T3	CS, PS	65	76	57	NO	T2, T3	CS, PS	76	T1, T2	CS, D	73	73	72	74			74
Germany	10.94	NCV	CS	CS	67	76	66	74	CS, T1	CS, D	72	CS, T1, T2, T3	CS, D	73	73	73	74	CS, D, M	CS, D	74
Greece	18.18	NCV	T1, T2	D, PS	77	77	69	74	T1, T2	CS, D, PS	83	T1, T2	CS, D	72	67	73	71	T1	D	NO
Hungary	5.77	NCV	T1, T2, T3	CS, D, PS	61	77	61	74	T1, T2, T3	CS, D, PS	78	T1, T2, T3	CS, D	72	70	64	74	T2	CS	NO
Ireland	13.50	NCV	T1	D	74	74	NO	NO	T1	D	74	T1	D	74	71	66	75	T1	D	74
Ireland	11.09	NCV	T1, T3	CS, D, PS	78	78	78	73	T1, T2, T3	CS, D, PS	80	T1, T2	CS, D	72	70	72	73			IE, NO
Italy	9.35	NCV	T3	CS	70	76	69	NO	T2	CS	79	T2	CS	71	67	69	74	T2	CS	NO
Japan	15.12	GCV	CS, T2	CS	66	69	64	70	CS, T2	CS	67	CS, T2	CS	67	68	65	70			NO
Kazakhstan	6.71	NCV	T1	D	73	77	71	73	T1	D	75	T1	D	65	70	63	67	T1	D	72
Latvia	7.57	NCV	T1, T2	CS, D	75	76	NO	75	T1, T2	CS, D, PS	72	T1, T2	CS, D	73	72	71	75	T1	D	NO
Liechtenstein	22.44	NCV	T2	CS	NA, NO		NA, NO	NO	T1, T2	CS, D	74	T1, T2	CS, D	74	74	74	73			NO
Lithuania	8.46	NCV	T1, T2, T3	CS, D, PS	66	70	66	73	T1, T2	CS, D, OTH	72	T2	CS	71	71	69	72	T2	CS	NO
Luxembourg	9.95	NCV	T2	CS	74	74	NO	NO	T1, T2, T3	CS, D, PS	74	T1, T2	CS, D	74	74	74	74	T1, T2	CS, D	NO
Malta	9.74	NCV	T2	CS	73	73	NO	NO	T1	D	71	T1	D	69	71	63	74	T1, T3	CS, D	NO
Monaco	19.01	NCV	T1, T2	CS, D	77	77	NO	NO	T2	CS	74	T1, T2	CS, D	74	75	74	NO			NO
Netherlands	10.37	NCV	CS, T2	CS, D	65	52	66	NO	T2	CS, D	66	T1, T2	CS, D	72	73	71	72	T2	CS	NO
New Zealand	5.11	GCV	T2	CS	65	69	65	NO	T2	CS	68	T2	CS	68	68	61	69			NO
Norway	12.41	NCV	T1, T2, T3	CS, PS	64	44	59	75	T1, T2, T3	CS, PS	71	T1, T2	CS, PS	72	72	71	72	T1, T2	CS, D	74
Poland	4.26	NCV	T1, T2	CS, D	71	76	68	74	T1, T2	CS, D	68	T1, T2	CS, D	72	72	64	74			IE
Portugal	11.59	NCV	T1, T2, T3	CR, D, PS	61	77	53	NO	T1, T2, T3	CR, D, PS	73	T1, T2	CS, D	69	68	64	74	T1	D	NO
Romania	8.62	NCV	T1, T2, T3	CS, D, PS	64	74	59	71	T1, T2, T3	CS, D, PS	71	T1, T2	CS, D	69	70	66	72	T1, T2	CS, D	72
Russian Federation	7.64	NCV	T1, T2	CS, D	74	76	73	74	T1, T2, T3	CS, D	74	T1, T2	CS, D	66	77	63	74	T1, T2	CS, D	73
Slovakia	4.21	NCV	T2, T3	CS, PS	72	77	72	67	T2	CS	97	T1, T2	CS, D	72	71	63	75	T1, T2	CS, D	63
Slovenia	6.93	NCV	T1, T2	CS, D, PS	67	67	NO	NO	T1, T2, T3	CS, D, PS	77	T1, T2	CS, D	72	70	72	74	T1	D	NO
Spain	14.76	NCV	T1, T2, T3	CS, D, OTH, PS	63	77	55	74	T1, T2, T3	CS, D, M, OTH, PS	86	T1, T2, T3	CS, D, M, OTH, PS	72	73	70	75	T1, T2	CS, D, M	IE, NO
Sweden	15.92	NCV	T2	CS	70	74	69	IE, NO	T1, T2	CS	71	T1, T2	CS	72	72	73	72			NO
Switzerland	20.86	NCV	T2, T3	CS	57	74	55	73	T2, T3	CS, PS	73	T1, T2, T3	CS, D	74	74	74	73	T2, T3	CS	NA
Turkey	6.15	NCV	T2, T3	CS, D, PS	73	77	72	NO	T1, T2	CS, D	94	T1, T2	CS, D	71	67	63	72			
Ukraine	0.37	NCV	T1, T2, T3	CS, D	73	76	74	68	T1, T2	CS, D	66	T1, T2	CS, D	69	63	64	74	T1	D	NA
United Kingdom of Great Britain and Northern Ireland (KP)	9.29	NCV	T1, T2	CS, D	69	76	68	70	T1, T2, T3	CS, D	72	T1, T2, T3	CS, D	75	76	73	79	T1	CS	IE, NO
United Kingdom of Great Britain and Northern Ireland (Convention)	9.40				69	76	68	70	T1, T2, T3	CS, D	72	T1, T2, T3	CS, D	75	76	73	79	T1	CS	IE, NO
United States of America	7.96	GCV	T2	CS	80	81	71	71	T2	CS	71	T2	CS, D	65	67	64	71	CS, T2	CS	24

Note: This table includes data from categories 1.A.1 Energy industries, 1.A.2 Manufacturing industries and construction, 1.A.4 Other sectors and 1.A.5 Other.

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b The following Parties reported energy data on a gross calorific value (GCV) basis: Australia, Canada, Japan, New Zealand and United States of America. Hence, reported IEFs are about 5 per cent lower for liquid and solid fuels and biomass, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.

^c Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.1 Energy industries.

^d Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.2 Manufacturing industries and construction.

^e Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.4 Other sectors.

^f Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.5 Other.

Table 1.3

Stationary combustion: solid fuels - CO₂ (2019)

	Share of national total ^a	IEF in CRF based on GCV or NCV ^b	Energy industries						Manufacturing industries and construction			Other sectors							Other		
			Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	
			Methods	EF	Total	Public electricity and heat production	Petroleum refining	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial / Institutional	Residential	Agriculture / Forestry / Fishing	Methods	EF	Stationary	
	%					(t/TJ)				(t/TJ)					(t/TJ)				(t/TJ)		
Australia	28.58	GCV	T2	CS, PS	91	91	NO	76	T2	CS	83	T2, T3	CS	93	93	NO	NO	T1, T3	CS	NO	
Austria	3.31	NCV	T1, T2	CS, D	93	93	NO	IE, NO	T1, T2, T3	CS, D	94	D, T1, T2, T3	CS, D	94	NO	94	95	T1, T2	CS, D	NO	
Belarus	2.40	NCV	T1, T2	CS, D	98	98	IE, NO	IE, NO	T1, T2	CS, D	100	T1, T2	CS, D	98	97	98	98	T1, T2	CS, D	98	
Belgium	6.25	NCV	CS, T1, T3	D, PS	220	254	NO	39	CS, T1, T3	D, PS	98	CS, T1, T3	D	95	95	95	95	CS, T1, T3	D	NO	
Bulgaria	36.50	NCV	T1, T2	CS, D	104	104	NO	101	T1, T2	CS, D	93	T1, T2	CS, D	91	94	90	94	T1	D	NO	
Canada	6.48	GCV	T2	CS	92	92	NO	NO	T1, T2, T3	CS	72	T1, T2, T3	CS	NO	NO	NO	NO	T2, T3	CS	NO	
Croatia	7.09	NCV	T1, T2	CS, D	93	93	NO	NO	T1	D	98	T1	D	99	IE, NO	99	NO			NO	
Cyprus	0.77	NCV	CS, T1	CS, D	NO	NO	NO	NO	CS, T1	CS, D	95	T1	D	NO	NO	NO	NO	T1	D	NO	
Czechia	41.40	NCV	T1, T2	CS, D	97	98	NO	93	T1, T2	CS, D	91	T1, T2	CS, D	94	97	94	97	T1	D	NO	
Denmark (KP)	8.11	NCV	T1, T2, T3	CS, D, PS	94	94	NO	NO	CR, M, T1, T2, T3	CS, D, PS	94	CR, M, T1, T2, T3	CS, D	94	NO	NO	94	CR, M, T2	CS	NO	
Denmark (Convention)	7.79	NCV	CS, T1, T2, T3	CS, D, PS	94	94	NO	NO	CR, M, T1, T2, T3	CS, D, PS	94	CR, M, T1, T2, T3	CS, D	94	NO	NO	94	CR, M, T1, T2	CS, D	NO	
Estonia	52.37	NCV	T1, T2, T3	CS, D, PS	53	101	NO	19	T1, T2, T3	CS, D, PS	100	T1, T2	CS, D	94	94	94	94			NO	
European Union (KP)	16.44				102	103	63	89			111			95	96	95	95			99	
European Union (Convention)	16.47				102	103	63	89			111			95	96	95	95			99	
Finland	13.29	NCV	T3	CS, D, PS	105	105	NO	90	T3	CS, D, PS	88	T1, T2, T3	CS, D	92	NO	88	92	T2	CS	NO	
France (KP)	3.54	NCV	T2, T3	CS, PS	148	134	NO	204	T2, T3	CS, PS	114	T1, T2	CS, D	95	95	95	NO			NO	
France (Convention)	4.03	NCV	T2, T3	CS, PS	148	134	NO	204	T2, T3	CS, PS	107	T1, T2	CS, D	95	95	95	NO			NO	
Germany	27.28	NCV	CS	CS	106	104	41	138	CS, T1	CS, D	136	CS, T1, T2, T3	CS, D	98	98	98	98	CS, D, M	CS, D	99	
Greece	19.73	NCV	T1, T2	D, PS	117	117	NO	NO	T1, T2	CS, D, PS	95	T1, T2	CS, D	99	IE, NO	99	99	T1	D	NO	
Hungary	10.13	NCV	T1, T2, T3	CS, D, PS	116	119	NO	76	T1, T2, T3	CS, D, PS	84	T1, T2	CS, D	102	102	102	97	T2	CS	NO	
Iceland	0.00	NCV	T1	D	NO	NO	NO	NO	T1	D	NA, NO	T1	D	NO	NO	NO	NO	T1	D	NO	
Ireland	2.70	NCV	T1, T3	CS, D, PS	92	92	NO	NO	T1, T2, T3	CS, D, PS	95	T1, T2	CS, D	97	95	97	NO			IE, NO	
Italy	6.88	NCV	T3	CS	104	95	NO	163	T2	CS	62	T2	CS	NO	NO	NO	NO	T2	CS	NO	
Japan	35.14	GCV	CS, T2	CS	88	89	89	82	CS, T2	CS	93	CS, T2	CS	93	93	NO	110			NO	
Kazakhstan	45.94	NCV	T1	D	96	96	104	96	T1	D	91	T1	D	96	96	96	96	T1	D	96	
Latvia	1.42	NCV	T1, T2	CS, D	97	97	NO	NO	T1, T2	CS, D, PS	97	T1, T2	CS, D	97	97	97	NO	T1	D	NO	
Liechtenstein	0.00	NCV	T2	CS	NA, NO		NA, NO	NO	T1, T2	CS, D	NA, NO	T1, T2	CS, D	NO	NO	NO	NO			NO	
Lithuania	3.34	NCV	T1, T2, T3	CS, D, PS	95	95	NO	NO	T1, T2	CS, D, OTH	97	T2	CS	95	95	95	95	T2	CS	NO	
Luxembourg	1.57	NCV	T2	CS	NO	NO	NO	NO	T1, T2, T3	CS, D, PS	95	T1, T2	CS, D	98	NO	98	NO	T1, T2	CS, D	NO	
Malta	0.00	NCV	T2	CS	NO	NO	NO	NO	T1	D	NO	T1	D	NO	NO	NO	NO	T1, T3	CS, D	NO	
Monaco	0.00	NCV	T1, T2	CS, D	NO	NO	NO	NO	T2	CS	NO	T1, T2	CS, D	NO	NO	NO	NO			NO	
Netherlands	13.61	NCV	CS, T2	CS, D	111	112	NO	89	T2	CS, D	54	T1, T2	CS, D	101	101	101	NO	T2	CS	NO	
New Zealand	5.05	GCV	T2	CS	93	93	NO	NO	T2	CS	92	T2	CS	92	92	92	92			NO	
Norway	1.08	NCV	T1, T2, T3	CS, PS	91	91	NO		T1, T2, T3	CS, PS	114	T1, T2	CS, PS	NO	NO	NO	NO	T1, T2	CS, D	NO	
Poland	45.10	NCV	T1, T2	CS, D	99	101	95	49	T1, T2	CS, D	105	T1, T2	CS, D	94	95	94	94			IE	
Portugal	7.42	NCV	T1, T2, T3	CR, D, PS	93	93	NO	NO	T1, T2, T3	CR, D, PS	95	T1, T2	CS, D	NO	NO	NO	NO	T1	D	NO	
Romania	12.23	NCV	T1, T2, T3	CS, D, PS	84	84	76	83	T1, T2, T3	CS, D, PS	93	T1, T2	CS, D	89	83	83	106	T1, T2	CS, D	NO	
Russian Federation	13.49	NCV	T1, T2	CS, D	95	96	NA	51	T1, T2, T3	CS, D	59	T1, T2	CS, D	96	95	96	96	T1, T2	CS, D	95	
Slovakia	19.22	NCV	T2, T3	CS, PS	119	101	NO	202	T2	CS	117	T1, T2	CS, D	97	97	98	99	T1, T2	CS, D	100	
Slovenia	25.90	NCV	T1, T2	CS, D, PS	102	102	NO	NO	T1, T2, T3	CS, D, PS	102	T1, T2	CS, D	96	NO	96	NO	T1	D	NO	
Spain	6.46	NCV	T1, T2, T3	CS, D, OTH, PS	107	110	NO	43	T1, T2, T3	CS, D, M, OTH, PS	145	T1, T2, T3	CS, D, M, OTH	104	106	103	NO	T1, T2	CS, D, M	IE, NO	
Sweden	7.71	NCV	T2	CS	156	188	NO	86	T1, T2	CS	132	T1, T2	CS	NO	NO	NO	NO			NA	
Switzerland	0.78	NCV	T2, T3	CS	NO	NO	NO	NO	T2, T3	CS, PS	95	T1, T2, T3	CS, D	93	NO	93	NO	T2, T3	CS	NO	
Turkey	30.48	NCV	T2, T3	CS, D, PS	103	102	NO	173	T1, T2	CS, D	110	T1, T2	CS, D	98	100	98	NO			NO	
Ukraine	22.02	NCV	T1, T2, T3	CS, D	90	92	NA, NO	56	T1, T2	CS, D	82	T1, T2	CS, D	93	88	95	95	T1	D	NA	
United Kingdom of Great Britain and Northern Ireland (KP)	4.70	NCV	T1, T2	CS, D	95	93	NO	116	T1, T2, T3	CS, D	159	T1, T2, T3	CS, D	94	94	94	NO	T1	CS	IE, NO	
United Kingdom of Great Britain and Northern Ireland (Convention)	4.70	NCV	T1, T2	CS, D	95	93	NO	116	T1, T2, T3	CS, D	159	T1, T2, T3	CS, D	94	94	94	NO	T1	CS	IE, NO	
United States of America	15.84	GCV	T2	CS	91	91	NA, NO	91	T2	CS	91	T2	CS, D	91	91	NA, NO	NA, NO	CS, T2	CS	83	

Note: This table includes data from categories 1.A.1 Energy industries, 1.A.2 Manufacturing industries and construction, 1.A.4 Other sectors and 1.A.5 Other.

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b The following Parties reported energy data on a gross calorific value (GCV) basis: Australia, Canada, Japan, New Zealand and United States of America. Hence, reported IEFs are about 5 per cent lower for liquid and solid fuels and biomass, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.

^c Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.1 Energy industries.

^d Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.2 Manufacturing industries and construction.

^e Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.4 Other sectors.

^f Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.5 Other.

Table 1.4

Stationary combustion: gaseous fuels - CO₂ (2019)

	Share of national total ^a	IEF in CRF based on GCV or NCV ^b	Energy industries							Manufacturing industries and construction			Other sectors						Other		
			Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	
			Methods	EF	Total	Public electricity and heat production	Petroleum refining	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial / Institutional	Residential	Agriculture / Forestry / Fishing	Methods	EF	Stationary	
																					(t/TJ)
Australia	14.17	GCV	T2	CS, PS	51	51	50	51	T2	CS	51	T2, T3	CS	51	51	51	51	T1, T3	CS	NO	
Austria	20.79	NCV	T1, T2	CS, D	56	56	56	56	T1, T2, T3	CS, D	56	D, T1, T2, T3	CS, D	56	56	56	56	T1, T2	CS, D	NO	
Belarus	37.25	NCV	T1, T2	CS, D	54	54	IE, NO	IE, NO	T1, T2	CS, D	54	T1, T2	CS, D	54	54	54	54	T1, T2	CS, D	54	
Belgium	28.50	NCV	CS, T1, T3	D, PS	56	56	56	NO	CS, T1, T3	D, PS	56	CS, T1, T3	D	56	56	56	56	CS, T1, T3	D	NO	
Bulgaria	7.31	NCV	T1, T2	CS, D	56	56	56	56	T1, T2	CS, D	56	T1, T2	CS, D	56	56	56	56	T1	D	NO	
Canada	29.45	GCV	T2	CS	50	49	48	50	T1, T2, T3	CS	49	T1, T2, T3	CS	49	49	49	49	T2, T3	CS	NO	
Croatia	19.35	NCV	T1, T2	CS, D	56	55	56	56	T1	D	56	T1	D	56	56	56	56			NO	
Cyprus	-	NCV	CS, T1	CS, D	NO	NO	NO	NO	CS, T1	CS, D	NO	T1	D	NO	NO	NO	NO	T1	D	NO	
Czechia	12.97	NCV	T1, T2	CS, D	55	55	55	55	T1, T2	CS, D	55	T1, T2	CS, D	55	55	55	55	T1	D	NO	
Denmark (KP)	13.55	NCV	T1, T2, T3	CS, D, PS	57	57	57	58	CR, M, T1, T2, T3	CS, D, PS	57	CR, M, T1, T2, T3	CS, D	57	57	57	57	CR, M, T2	CS	NO	
Denmark (Convention)	13.01	NCV	CS, T1, T2, T3	CS, D, PS	57	57	57	58	CR, M, T1, T2, T3	CS, D, PS	57	CR, M, T1, T2, T3	CS, D	57	57	57	57	CR, M, T1, T2	CS, D		
Estonia	6.15	NCV	T1, T2, T3	CS, D, PS	55	55	NO	IE, NO	T1, T2, T3	CS, D, PS	55	T1, T2	CS, D	55	55	55	55			NO	
European Union (KP)	21.94				56	56	56	59			56			56	56	56	56			56	
European Union (Convention)	21.98				56	56	56	59			56			56	56	56	56			56	
Finland	7.35	NCV	T3	CS, D, PS	55	55	55	NO	T3	CS, D, PS	55	T1, T2, T3	CS, D	55	55	55	55	T2	CS	55	
France (KP)	19.13	NCV	T2, T3	CS, PS	56	56	56	NE, NO	T2, T3	CS, PS	56	T1, T2	CS, D	56	56	56	56			56	
France (Convention)	18.83	NCV	T2, T3	CS, PS	56	56	56	NE, NO	T2, T3	CS, PS	56	T1, T2	CS, D	56	56	56	56			56	
Germany	20.57	NCV	CS	CS	56	56	56	57	CS, T1	CS, D	56	CS, T1, T2, T3	CS, D	56	56	56	56	CS, D, M	CS, D	56	
Greece	11.04	NCV	T1, T2	D, PS	56	56	IE, NO	59	T1, T2	CS, D, PS	56	T1, T2	CS, D	56	56	56	56	IE, NO	T1	D	NO
Hungary	27.93	NCV	T1, T2, T3	CS, D, PS	56	56	56	56	T1, T2, T3	CS, D, PS	56	T1, T2	CS, D	56	55	56	56	T2	CS	56	
Iceland	-	NCV	T1	D	NO	NO	NO	NO	T1	D	NO	T1	D	NO	NO	NO	NO	T1	D	NO	
Ireland	17.70	NCV	T1, T3	CS, D, PS	55	56	7	55	T1, T2, T3	CS, D, PS	56	T1, T2	CS, D	56	56	56	56	NO		IE, NO	
Italy	34.01	NCV	T3	CS	58	58	58	58	T2	CS	58	T2	CS	58	58	58	58	T2	CS	NO	
Japan	18.26	GCV	CS, T2	CS	51	51	51	51	CS, T2	CS	51	CS, T2	CS	51	51	51	51			NO	
Kazakhstan	13.77	NCV	T1	D	56	56	56	56	T1	D	42	T1	D	56	56	56	56	T1	D	56	
Latvia	22.77	NCV	T1, T2	CS, D	56	56	56	56	T1, T2	CS, D, PS	56	T1, T2	CS, D	56	56	56	56	T1	D	NO	
Liechtenstein	26.69	NCV	T2	CS	56	56	NA, NO	NO	T1, T2	CS, D	56	T1, T2	CS, D	56	56	56	NO			NO	
Lithuania	10.05	NCV	T1, T2, T3	CS, D, PS	56	56	56	56	T1, T2	CS, D, OTH	56	T2	CS	56	56	56	56	T2	CS	NO	
Luxembourg	14.97	NCV	T2	CS	56	56	NO	NO	T1, T2, T3	CS, D, PS	56	T1, T2	CS, D	56	56	56	56	T1, T2	CS, D	NO	
Malta	32.56	NCV	T2	CS	55	55	NO	NO	T1	D	NO	T1	D	NO	NO	NO	NO	T1, T3	CS, D	NO	
Monaco	14.29	NCV	T1, T2	CS, D	56	56	NO	NO	T2	CS	56	T1, T2	CS, D	56	56	56	NO			NO	
Netherlands	38.26	NCV	CS, T2	CS, D	57	57	57	77	T2	CS, D	57	T1, T2	CS, D	57	57	57	57	T2	CS	NO	
New Zealand	9.41	GCV	T2	CS	54	54	54	54	T2	CS	54	T2	CS	54	54	54	54			NO	
Norway	24.81	NCV	T1, T2, T3	CS, PS	60	60	NO	60	T1, T2, T3	CS, PS	56	T1, T2	CS, PS	56	56	56	56	T1, T2	CS, D	NO	
Poland	7.79	NCV	T1, T2	CS, D	55	55	55	55	T1, T2	CS, D	55	T1, T2	CS, D	55	55	55	55			IE	
Portugal	18.63	NCV	T1, T2, T3	CR, D, PS	56	56	56	NO	T1, T2, T3	CR, D, PS	56	T1, T2	CS, D	56	56	56	56	T1	D	NO	
Romania	18.25	NCV	T1, T2, T3	CS, D, PS	56	56	57	56	T1, T2, T3	CS, D, PS	56	T1, T2	CS, D	56	56	56	56	T1, T2	CS, D	NO	
Russian Federation	33.30	NCV	T1, T2	CS, D	54	54	54	54	T1, T2, T3	CS, D	54	T1, T2	CS, D	54	54	54	54	T1, T2	CS, D	54	
Slovakia	19.93	NCV	T2, T3	CS, PS	56	56	56	56	T2	CS	56	T1, T2	CS, D	56	56	56	56	T1, T2	CS, D	56	
Slovenia	9.82	NCV	T1, T2	CS, D, PS	55	55	NO	55	T1, T2, T3	CS, D, PS	55	T1, T2	CS, D	55	55	55	NO	T1	D	NO	
Spain	21.86	NCV	T1, T2, T3	CS, D, OTH, PS	56	56	56	56	T1, T2, T3	CS, D, M, OTH, PS	56	T1, T2, T3	CS, D, M, OTH	56	56	56	56	T1, T2	CS, D, M	IE, NO	
Sweden	2.77	NCV	T2	CS	56	57	54	IE, NO	T1, T2	CS	57	T1, T2	CS	57	57	57	57			NO	
Switzerland	14.58	NCV	T2, T3	CS	56	56	IE, NO		T2, T3	CS, PS	56	T1, T2, T3	CS, D	56	56	56	56	T2, T3	CS		
Turkey	15.89	NCV	T2, T3	CS, D, PS	55	55	55	NO	T1, T2	CS, D	54	T1, T2	CS, D	54	54	54	54				
Ukraine	16.22	NCV	T1, T2, T3	CS, D	56	56	56	59	T1, T2	CS, D	56	T1, T2	CS, D	56	56	56	56	T1	D		
United Kingdom of Great Britain and Northern Ireland (KP)	34.97	NCV	T1, T2	CS, D	57	56	56	58	T1, T2, T3	CS, D	56	T1, T2, T3	CS, D	56	56	56	56	T1	CS	IE, NO	
United Kingdom of Great Britain and Northern Ireland (Convention)	34.91	NCV	T1, T2	CS, D	57	56	56	58	T1, T2, T3	CS, D	56	T1, T2, T3	CS, D	56	56	56	56	T1	CS	IE, NO	
United States of America	24.50	GCV	T2	CS	50	50	50	50	T2	CS	50	T2	CS, D	50	50	50	50	CS, T2	CS	22	

Note: This table includes data from categories 1.A.1 Energy industries, 1.A.2 Manufacturing industries and construction, 1.A.4 Other sectors and 1.A.5 Other.

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b The following Parties reported energy data on a gross calorific value (GCV) basis: Australia, Canada, Japan, New Zealand and United States of America. Hence, reported IEFs are about 3 per cent lower for liquid and solid fuels and biomass, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.

^c Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.1 Energy industries.

^d Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.2 Manufacturing industries and construction.

^e Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.4 Other sectors.

^f Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.5 Other.

Table 1.5

Stationary combustion: other fossil fuels - CO₂ (2019)

	Share of national total ^a	IEF in CRF based on GCV or NCV ^b	Energy industries						Manufacturing industries and construction			Other sectors							Other		
			Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	Methods and EF used ^c		CO ₂ IEF				Methods and EF used ^c		CO ₂ IEF	
			Methods	EF	Total	Public electricity and heat production	Petroleum refining	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial / Institutional	Residential	Agriculture / Forestry / Fishing	Methods	EF	Stationary	
	%				(t/TJ)									(t/TJ)						(t/TJ)	
Australia	0.00	GCV	T2	CS, PS	NO	NO	NO	NO	T2	CS	NO	T2, T3	CS	NA, NO	NO	NO	NA, NO	T1, T3	CS	NO	
Austria	2.48	NCV	T1, T2	CS, D	47	47	NO	NO	T1, T2, T3	CS, D	72	D, T1, T2, T3	CS, D	72	70	75	75	T1, T2	CS, D	NO	
Belarus	0.00	NCV	T1, T2	CS, D	IE, NO	NO	IE, NO	IE, NO	T1, T2	CS, D	IE, NO	T1, T2	CS, D	NO	NO	NO	NO	T1, T2	CS, D	NO	
Belgium	2.54	NCV	CS, T1, T3	D, PS	105	103	125	NO	CS, T1, T3	D, PS	80	CS, T1, T3	D	66	66	NO	NO	CS, T1, T3	D	NO	
Bulgaria	0.35	NCV	T1, T2	CS, D	NO	NO	NO	NO	T1, T2	CS, D	75	T1, T2	CS, D	NO	NO	NO	NO	T1	D	NO	
Canada	0.08	GCV	T2	CS	NO	NO	NO	NO	T1, T2, T3	CS	78	T1, T2, T3	CS	96	96	NO	NO	T2, T3	CS	NO	
Croatia	0.68	NCV	T1, T2	CS, D	NO	NO	NO	NO	T1	D	143	T1	D	NO	NO	NO	NO	T1	D	NO	
Cyprus	1.43	NCV	CS, T1	CS, D	NO	NO	NO	NO	CS, T1	CS, D	98	T1	D	NO	NO	NO	NO	T1	D	NO	
Czechia	0.67	NCV	T1, T2	CS, D	92	92	NO	NO	T1, T2	CS, D	80	T1, T2	CS, D	NO	NO	NO	NO	T1	D	NO	
Denmark (KP)	4.07	NCV	T1, T2, T3	CS, D, PS	95	95	NO	NO	CR, M, T1, T2, T3	CS, D, PS	88	CR, M, T1, T2, T3	CS, D	NO	NO	NO	NO	CR, M, T2	CS	NO	
Denmark (Convention)	3.97	NCV	CS, T1, T2, T3	CS, D, PS	95	95	NO	NO	CR, M, T1, T2, T3	CS, D, PS	88	CR, M, T1, T2, T3	CS, D	NO	NO	NO	NO	CR, M, T1, T2	CS, D	NO	
Estonia	1.54	NCV	T1, T2, T3	CS, D, PS	66	66	NO	NO	T1, T2, T3	CS, D, PS	79	T1, T2	CS, D	NO	NO	NO	NO			NO	
European Union (KP)	1.77				82	82	107	143			74			96	96	78	95			72	
European Union (Convention)	1.77				82	82	107	143			74			96	96	78	95			72	
Finland	1.95	NCV	T3	CS, D, PS	74	74	NO	NO	T3	CS, D, PS	83	T1, T2, T3	CS, D	NO	NO	NO	NO	T2	CS	NO	
France (KP)	1.83	NCV	T2, T3	CS, PS	107	107	38	NO	T2, T3	CS, PS	67	T1, T2	CS, D	74	75	73	74			72	
France (Convention)	1.80	NCV	T2, T3	CS, PS	107	107	38	NO	T2, T3	CS, PS	67	T1, T2	CS, D	74	75	73	74			72	
Germany	2.54	NCV	CS	CS	85	85	NO	NO	CS, T1	CS, D	76	CS, T1, T2, T3	CS, D	IE, NO	IE, NO	IE, NO	IE, NO	CS, D, M	CS, D	NO	
Greece	0.21	NCV	T1, T2	D, PS	NO	NO	NO	NO	T1, T2	CS, D, PS	89	T1, T2	CS, D	IE, NO	IE, NO	IE, NO	IE, NO	T1	D	NO	
Hungary	1.15	NCV	T1, T2, T3	CS, D, PS	100	92	NE	NO	T1, T2, T3	CS, D, PS	72	T1, T2	CS, D	91	91	NO	NO	T2	CS	NO	
Iceland	0.04	NCV	T1	D	NO	NO	NO	NO	T1	D	73	T1	D	NO	NO	NO	NO	T1	D	NO	
Ireland	1.39	NCV	T1, T3	CS, D, PS	171	171	NO	NO	T1, T2, T3	CS, D, PS	84	T1, T2	CS, D	NO	NO	NO	NO			IE, NO	
Italy	1.61	NCV	T3	CS	95	95	NO	NO	T2	CS	81	T2	CS	97	97	NO	NO	T2	CS	NO	
Japan	1.55	GCV	CS, T2	CS	47	IE, NO	47	47	CS, T2	CS	45	CS, T2	CS	31	31	NO	NO			NO	
Kazakhstan	0.00	NCV	T1	D	NA	NA	NA	NA	T1	D	NA	T1	D	NA, NO	NA	NA	NA, NO	T1	D	NA	
Latvia	1.09	NCV	T1, T2	CS, D	NO	NO	NO	NO	T1, T2	CS, D, PS	86	T1, T2	CS, D	73	73	NO	73	T1	D	NO	
Liechtenstein	0.02	NCV	T2	CS	NA, NO		NA, NO	NO	T1, T2	CS, D	NA, NO	T1, T2	CS, D	69		NO	69			NO	
Lithuania	0.97	NCV	T1, T2, T3	CS, D, PS	126	126	NO	NO	T1, T2	CS, D, OTH	108	T2	CS	NO	NO	NO	NO	T2	CS	NO	
Luxembourg	1.84	NCV	T2	CS	98	98	NO	NO	T1, T2, T3	CS, D, PS	77	T1, T2	CS, D	73	NO	NO	73	T1, T2	CS, D	NO	
Malta	0.00	NCV	T2	CS	NO	NO	NO	NO	T1	D	NO	T1	D	NO	NO	NO	NO	T1, T3	CS, D	NO	
Monaco	25.76	NCV	T1, T2	CS, D	71	71	NO	NO	T2	CS	75	T1, T2	CS, D	75	NO	75	NO			NO	
Netherlands	1.51	NCV	CS, T2	CS, D	80	80	NO	NO	T2	CS, D	NO	T1, T2	CS, D	77	77	NO	77	T2	CS	NO	
New Zealand	0.00	GCV	T2	CS	NO	NO	NO	NO	T2	CS	NO	T2	CS	NO	NO	NO	NO			NO	
Norway	2.46	NCV	T1, T2, T3	CS, PS	88	88	NO	NO	T1, T2, T3	CS, PS	77	T1, T2	CS, PS	81	81		NO	T1, T2	CS, D	NO	
Poland	1.42	NCV	T1, T2	CS, D	97	97	NO	143	T1, T2	CS, D	133	T1, T2	CS, D	128	128	IE, NO	NO			IE	
Portugal	1.17	NCV	T1, T2, T3	CR, D, PS	114	114	NO	NO	T1, T2, T3	CR, D, PS	54	T1, T2	CS, D	NO	NO	NO	NO	T1	D	NO	
Romania	0.94	NCV	T1, T2, T3	CS, D, PS	NO	NO	NO	NO	T1, T2, T3	CS, D, PS	91	T1, T2	CS, D	92	92	NO	NO	T1, T2	CS, D	NO	
Russian Federation	2.07	NCV	T1, T2	CS, D	143	143	143	143	T1, T2, T3	CS, D	143	T1, T2	CS, D	143	143	143	143	T1, T2	CS, D	143	
Slovakia	1.38	NCV	T2, T3	CS, PS	78	78	NO	NO	T2	CS	103	T1, T2	CS, D	NO	NO	NO	NO	T1, T2	CS, D	NO	
Slovenia	0.87	NCV	T1, T2	CS, D, PS	92	92	NO	NO	T1, T2, T3	CS, D, PS	59	T1, T2	CS, D	NO	NO	NO	NO	T1	D	NO	
Spain	0.76	NCV	T1, T2, T3	CS, D, OTH, PS	63	63	54	NO	T1, T2, T3	CS, D, M, OTH, PS	51	T1, T2, T3	CS, D, M, OTH	NO	NO	NO	NO	T1, T2	CS, D, M	NO	
Sweden	6.40	NCV	T2	CS	94	94	NO	NO	T1, T2	CS	78	T1, T2	CS	75	75	74	75			NO	
Switzerland	6.37	NCV	T2, T3	CS	89	89	NO	NO	T2, T3	CS, PS	66	T1, T2, T3	CS, D	NO			NO	T2, T3	CS	NA	
Turkey	0.46	NCV	T2, T3	CS, D, PS	139	139	NO	NO	T1, T2	CS, D	139	T1, T2	CS, D	NO	NO		NO				
Ukraine	1.13	NCV	T1, T2, T3	CS, D	73	73	NA, NO	73	T1, T2	CS, D	73	T1, T2	CS, D	73	73	73	73	T1	D	NA	
United Kingdom of Great Britain and Northern Ireland (KP)	1.49	NCV	T1, T2	CS, D	62	62	NO	NO	T1, T2, T3	CS, D	49	T1, T2, T3	CS, D	NO	NO	NO	NO	T1	CS	IE, NO	
United Kingdom of Great Britain and Northern Ireland (Convention)	1.49	NCV	T1, T2	CS, D	62	62	NO	NO	T1, T2, T3	CS, D	49	T1, T2, T3	CS, D	NO	NO	NO	NO	T1	CS	IE, NO	
United States of America	0.18	GCV	T2	CS	6.7	6.7	NO	NO	T2	CS	NO	T2	CS, D	NO	NO	NO	NO	CS, T2	CS	50	

Note: This table includes data from categories 1.A.1 Energy industries, 1.A.2 Manufacturing industries and construction, 1.A.4 Other sectors and 1.A.5 Other.

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.^b The following Parties reported energy data on a gross calorific value (GCV) basis: Australia, Canada, Japan, New Zealand and United States of America. Hence, reported IEFs are about 5 per cent lower for liquid and solid fuels and biomass, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.^c Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.1 Energy industries.^d Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.2 Manufacturing industries and construction.^e Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.4 Other sectors.^f Information on methods and emission factors in this table is as reported by Parties in table Summary 3 of the CRF. It may not reflect the actual method or type of emission factor used for all subcategories within the category 1.A.5 Other.

Table 1.6

Road transportation - CO₂, N₂O (2019)

	CO ₂ emissions						N ₂ O emissions					
	Share of national total ^a	Methods and EF used		IEF in CRF based on GCV or NCV ^b	CO ₂ IEF		Share of national total ^a	Methods and EF used		IEF in CRF based on GCV or NCV ^b	N ₂ O IEF	
		Methods	EF		Gasoline	Diesel oil		Methods	EF		Gasoline	Diesel oil
IPCC default EF ^c				NCV	69.3 (67.5 to 73.0)	74.1 (72.6 to 74.8)				NCV	8.0 (0.96 to 24)	3.9 (1.3 to 12)
Australia	15.32	T2	CS, D	GCV	67	70	0.16	T1, T3	CS, D	GCV	3.1	1.6
Austria	29.36	T1, T2	CS, D	NCV	75	74	0.33	T3	CS	NCV	0.48	3.2
Belarus	1.31	T1	D	NCV	69	74	0.02	T1	D	NCV	8.0	3.9
Belgium	21.20	M, T2	CS, M	NCV	72	74	0.23	M, T3	CS, M	NCV	0.59	3.1
Bulgaria	17.19	T2	CR	NCV	75	75	0.24	T2	CR	NCV	1.7	3.7
Canada	20.56	T1, T3	CS	GCV	69	70	0.36	T1, T3	CS	GCV	3.8	3.9
Croatia	26.62	T1	D	NCV, NO	69	74	0.26	T1, T3	CR, D	NCV	1.3	2.8
Cyprus	23.97	T1, T2	D, M	NCV	72	74	0.24	T1, T2	D, M	NCV	0.71	4.3
Czechia	15.02	T2	M	NCV	71	74	0.14	T3	M	NCV	0.96	2.5
Denmark (KP)	27.35	CR, M, T2	CS	NCV	73	74	0.30	CR, M, T3	CR	NCV	0.68	3.4
Denmark (Convention)	26.58	CR, M, T1, T2	CS, D	NCV	73	74	0.29	CR, M, T1, T3	CR, D, OTH	NCV	0.71	3.4
Estonia	15.72	T1, T2	CS, D	NCV	70	73	0.14	T1, T3	CS, D	NCV	0.97	2.9
European Union (KP)	21.99				73	74	0.23				0.84	3.1
European Union (Convention)	21.99				73	74	0.23				0.84	3.1
Finland	19.70	T2	CS	NCV	71	73	0.16	T3	CR	NCV	0.74	2.2
France (KP)	28.28	T3	M	NCV	72	75	0.27	T3	M	NCV	1.1	2.5
France (Convention)	28.08	T3	M	NCV	75	75	0.27	T3	M	NCV	1.2	2.5
Germany	19.48	CS, M, T2, T3	CS, D	NCV	75	74	0.22	CS, M, T2, T3	CS, M	NCV	0.49	3.7
Greece	17.52	T1, T2, T3	CS, D	NCV	73	73	0.14	M, T1	D, M	NCV	1.7	2.1
Hungary	22.03	T1, T2	CS, D	NCV	71	74	0.23	T1, T3	D, M	NCV	1.3	3.1
Iceland	19.92	T1, T2	D	NCV	71	73	0.22	T3	D	NCV	0.81	3.4
Ireland	19.22	T2, T3	CS, M	NCV	70	73	0.21	T3	M	NCV	0.71	3.0
Italy	23.10	T2	CS, M	NCV	73	74	0.23	T3	M	NCV	0.99	2.8
Japan	14.64	T2	CS	GCV	68	69	0.12	T3	CS, D	GCV	1.0	3.2
Kazakhstan	6.14	T1	D	NCV	69	74	0.10	T1	D	NCV	3.2	5.7
Latvia	28.12	T1, T2	CS, D	NCV	71	75	0.25	T1, T3	CR, D, M	NCV	0.92	2.5
Liechtenstein	30.02	T2	CS	NCV	74	73	0.27	T2	CS, D	NCV	0.66	3.3
Lithuania	29.42	T1, T2	CS, D	NCV, NO	70	73	0.26	T1, T3	CR, D	NCV	0.66	2.3
Luxembourg	56.67	T1, T2	CS, D	NCV	73	74	0.62	T3	M	NCV	0.40	3.0
Malta	32.87	T1, T3	M	NCV	72	74	0.21	T1, T3	M	NCV	0.99	1.8
Monaco	25.03	T2	CS	NCV	72	75	0.45	T2	CS, D	NCV	3.9	3.9
Netherlands	16.37	T1, T2	CS	NCV	73	72	0.14	T1, T2	CS	NCV	0.74	2.8
New Zealand	17.69	T2	CS	GCV	67	69	0.11	T3	CS	GCV	1.4	1.5
Norway	16.61	T2	CS	NCV, NO	71	74	0.19	T2	CS	NCV	0.51	2.8
Poland	16.40	T2	D	NCV, NO	72	74	0.16	T3	D	NCV	1.4	2.8
Portugal	26.33	T2	OTH	NCV	72	74	0.26	OTH, T3	CR, OTH	NCV	1.5	2.4
Romania	16.04	T1, T3	D, OTH	NCV	74	81	0.18	T1, T3	D, OTH	NCV	1.6	3.1
Russian Federation	7.50	T1, T2	CS, D	NCV	73	74	0.05	T1, T2, T3	CS, D	NCV	1.5	2.0
Slovakia	18.73	T2	CS, D	NCV	70	75	0.20	T3	D	NCV	0.74	3.0
Slovenia	32.44	M	M	NCV	71	74	0.38	M	M	NCV	0.82	3.1
Spain	26.55	T1, T2	CS, D, M	NCV	73	73	0.29	T3	M	NCV	0.84	3.2
Sweden	29.09	T2	CS		72	72	0.35	M, T1, T2	CS, D		0.38	4.7
Switzerland	31.24	T2	CS	NCV	74	73	0.27	T3	CS	NCV	0.66	3.3
Turkey	14.85	T1, T2	CS, D	NCV	69	72	0.24	T1	D	NCV	8.0	3.9
Ukraine	7.81	T1, T2	CS, D	NCV	72	74	0.13	T1	D	NCV	5.6	3.9
United Kingdom of Great Britain and Northern Ireland (KP)	24.27	T1, T3	CS, OTH	NCV	70	74	0.25	T3	CR, CS	NCV	0.66	3.5
United Kingdom of Great Britain and Northern Ireland (Convention)	24.24	OTH, T1, T3	CS, OTH	NCV	70	74	0.25	T3	CR, CS	NCV	0.66	3.5
United States of America	23.03	CS, T1, T2	CS	GCV	67	70	0.14	M, T1, T2	CS, D, M	GCV	1.3	1.62

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b The following Parties reported energy data on a gross calorific value (GCV) basis: Australia, Canada, Japan, New Zealand and United States of America. Hence, reported IEFs are about 5 per cent lower for liquid and solid fuels and biomass, and about 10 per cent lower for gaseous fuels than would have been the case if the data were given on a net calorific value (NCV) basis.

^c Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 3 Mobile Combustion. CO₂ table 3.2.1; N₂O table 3.2.2.

Table 1.7

Domestic aviation and navigation - CO₂ (2019)

	Methods and EF used		Domestic aviation			Domestic navigation		
			Share of national total ^a	CO ₂ IEF		Share of national total ^a	CO ₂ IEF	
	Methods	EF		Jet kerosene	Aviation gasoline		Residual fuel oil	Gas/diesel oil
IPCC default EF ^b				71.5 (69.8 to 74.4)	70 (67.5 to 73.0)		77.4 (75.5 to 78.8)	74.1 (72.6 to 74.8)
Australia	T2	CS	1.55	70	67	0.40	74	70
Austria	T1, T2, T3	CS, D	0.06	73	74	0.10	NO	74
Belarus	T1	D	0.01	72	NO	0.68	NA	74
Belgium	T1, T3	CS, D	0.01	73	72	0.32	IE	69
Bulgaria	T1, T2	D	0.04	72	69	0.01	NO	74
Canada	T2, T3	CS	1.13	68	69	0.55	74	70
Croatia	T1	D	0.14	72	70	0.66	NO	74
Cyprus	T1	D	0.00	71	NO	0.03	NO	74
Czechia	T1	D	0.01	71	70	0.01	NO	74
Denmark (KP)	CR, M, T2	CS	0.34	72	73	1.16	78	74
Denmark (Convention)	CR, M, T1, T2	CS, D	0.43	72	72	1.32	78	74
Estonia	T2	CS, D	0.03	NO	71	0.11	NO	73
European Union (KP)			0.42	73	70	0.55	78	74
European Union (Convention)			0.41	73	70	0.55	78	74
Finland	T1, T2	CS	0.39	73	71	0.81	78	73
France (KP)	T1, T3	CS, M	1.22	73	71	0.29	78	75
France (Convention)	T1, T3	CS, M	1.22	73	71	0.32	78	75
Germany	CS, T1, T2	CS, D, M	0.27	73	70	0.20	79	74
Greece	T1, T2, T3	CS, D	0.48	71	69	2.42	78	77
Hungary	T1, T2	CS, D	0.01	73	70	0.02	NO	74
Iceland	T1	D	0.59	72	70	1.12	77	74
Ireland	M, T2, T3	CS	0.03	71	71	0.46	NO	73
Italy	T1, T2	CS	0.57	72	70	1.07	77	74
Japan	T2	CS	0.87	68	68	0.86	IE	69
Kazakhstan	T1, T2	CS, D	0.33	72	69	0.00	NO	74
Latvia	T1, T2	CS, D	0.01	72	70	0.09	NO	75
Liechtenstein	T1	CS	0.04	73	NO	–	NO	NO
Lithuania	T1	CS	0.01	72	71	0.08	NO	73
Luxembourg	T1, T2	CS, D	0.00	NO	70	0.01	NO	74
Malta	T1, T3	CS, D, M	0.06	71	69	1.21	NO	74
Monaco	T1	CS, D	0.74	72	NO	1.26	NO	75
Netherlands	T1, T2	CS, D	0.02	72	72	0.51	NO	72
New Zealand	T2	CS	1.23	68	66	0.40	73	NO
Norway	T1, T2	CS, D, PS	2.14	73	71	5.02	79	74
Poland	T1	D	0.03	72	70	0.00	NO	74
Portugal	T1, T2, T3	D	0.78	71	70	0.42	77	74
Romania	T1, T2	CS, D, OTH	0.17	72	70	0.12	NO	72
Russian Federation	T1, T1b	D	0.63	72	IE	0.07	77	74
Slovakia	T1, T3	D	0.00	73	70	0.01	NO	74
Slovenia	T1	D	0.01	72	70	0.00	NO	74
Spain	T1, T3	D	0.99	73	71	1.04	77	74
Sweden	T1, T2	CS, D	0.92	72	70	1.34	78	73
Switzerland	T2, T3	CS	0.25	73	IE	0.24	NO	73
Turkey	T2	CS, D	0.69	71	NO	0.24	77	72
Ukraine	T1, T2, T3	CS, D, OTH	0.05	72	70	0.03	NO	74
United Kingdom of Great Britain and Northern Ireland (KP)	T2, T3	CS	0.37	72	70	1.23	76	75
United Kingdom of Great Britain and Northern Ireland (Convention)	T2, T3	CS	0.39	72	70	1.23	76	75
United States of America	T1, T2	CS	2.54	68	66	0.49	71	68

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 3 Mobile Combustion. Table 3.6.4 for Jet kerosene, Aviation gasoline; table 3.5.2 for Residual oil Gas/diesel oil.

Table 1.8**Domestic and international aviation - activity data (2019)**

	Domestic aviation						International aviation					
	Jet kerosene			Aviation gasoline			Jet kerosene			Aviation gasoline		
	CRF	IEA ^{a, b, d}	Difference	CRF	IEA ^{a, c, d}	Difference	CRF	IEA ^{a, b, d}	Difference	CRF	IEA ^{a, c, d}	Difference
	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)
Australia	119 267	121 607	1.96	2 263	2 112	-6.65	220 384	211 357	-4.10	NO	0	—
Austria	541	1 199	121.57	92	97	5.32	40 032	39 692	-0.85	NO	0	—
Belarus	110	646	486.12	NO	0	—	5 318	8 013	50.66	NO	0	—
Belgium	120	77	-35.25	21	26	24.36	72 371	71 359	-1.40	1.8	0	—
Bulgaria	276	465	68.60	11	11	0.01	10 180	10 180	0.00	NO	0	—
Canada	117 971	288 116	144.23	2 144	2 106	-1.79	218 672	35 948	-83.56	56	0	—
Croatia	431	431	0.00	18	18	0.00	8 352	8 352	0.00	4.5	4	0.00
Cyprus	5.2	89	1594.93	NO	0	—	14 365	12 988	-9.59	NO	0	—
Czechia	11	1 849	16743.29	131	132	0.48	17 699	17 415	-1.60	NO	0	—
Denmark (KP)	2 035	—	—	41	—	—	43 028	—	—	NO	0	—
Denmark (Convention)	2 740	1 275	-53.46	47	41	-13.78	43 039	43 270	0.54	NO	0	—
Estonia	NO	54	—	55	0	—	2 941	2 867	-2.51	NO	0	—
European Union (KP)	231 179	303049	31.09	2 694	1 861	-30.92	2 338 131	2095418	-10.38	156	622	299.46
European Union (Convention)	228 114	309 850	35.83	2 655	2 402	-9.52	2 324 410	2 231 868	-3.98	161	629	291.02
Finland	2 785	2 752	-1.18	26	44	68.75	35 166	34 916	-0.71	NO	0	—
France (KP)	71 809	—	—	695	—	—	254 263	—	—	69	—	—
France (Convention)	72 816	71 857	-1.32	695	729	4.91	258 294	255 025	-1.27	69	0	—
Germany	29 991	30 401	1.37	302	352	16.58	404 499	409 876	1.33	17	0	—
Greece	5 653	9 311	64.70	96	95	-1.78	55 841	47 332	-15.24	NO	4.7	—
Hungary	23	0	—	87	88	1.51	11 683	11 610	-0.62	1.9	0	—
Iceland	372	363	-2.49	16	17	2.15	13 376	13 042	-2.49	NO	0	—
Ireland	214	214	-0.05	31	0	—	46 491	45 331	-2.49	NO	0	—
Italy	33 111	37 873	14.38	162	86	-46.95	173 462	166 154	-4.21	NO	0	—
Japan	153 693	147 506	-4.03	94	93	-0.95	314 716	260 749	-17.15	NO	0	—
Kazakhstan	14 487	5 395	-62.76	2 117	206	-90.26	8 435	20 048	137.66	NO	0	—
Latvia	19	5.4	-71.71	4.0	3	-24.11	6 612	6 536	-1.14	NO	0	—
Liechtenstein	1.14	—	—	NO	—	—	15	—	—	NO	—	—
Lithuania	8.0	8.6	7.50	20	18	-11.99	5 162	5 130	-0.62	NO	0	—
Luxembourg	NO	0	—	7.2	9	26.45	25 147	25 086	-0.24	0.80	0	—
Malta	17	25	41.58	0.75	1.3	69.38	7 199	6 900	-4.15	0.29	0.9	206.14
Monaco	8.5	—	—	NO	—	—	36	—	—	NO	—	—
Netherlands	415	410	-1.15	30	30	0.00	166 290	164 379	-1.15	NO	0	—
New Zealand	14 503	13 902	-4.14	389	366	-5.70	56 506	54 367	-3.78	NO	0	—
Norway	14 669	14 635	-0.23	70	70	0.22	22 985	22 932	-0.23	19	19	0.30
Poland	1 614	1 240	-23.13	178	176	-0.95	44 678	45 053	0.84	NO	1.7	—
Portugal	6 920	6 919	0.00	15	50	231.23	61 047	61 050	0.00	33	0	—
Romania	2 634	2 634	0.00	74	74	0.00	6 390	6 390	0.00	NO	0	—
Russian Federation	187 830	245 100	30.49	IE	44	—	156 581	245 100	56.53	NO	0	—
Slovakia	23	0	—	2.0	0	—	2 543	1 892	-25.61	1.6	0	—
Slovenia	7.0	0	—	21	21	1.05	1 080	1 137	5.26	NO	0	—
Spain	42 721	96 879	126.77	170	220	29.55	260 337	199 649	-23.31	23	0	—
Sweden	6 543	6 622	1.21	26	37	42.09	36 981	37 280	0.81	NO	0	—
Switzerland	1 571	2 644	68.36	IE	126	—	78 196	77 950	-0.31	IE	0	—
Turkey	49 140	50 439	2.64	NO	0	—	194 649	184 427	-5.25	NO	0	—
Ukraine	1 501	0	—	966	0	—	24 063	0	—	NO	0	—
United Kingdom of Great Britain and Northern Ireland (KP)	22 882	—	—	364	—	—	510 916	—	—	2.5	—	—
United Kingdom of Great Britain and Northern Ireland (Convention)	24 289	37 260	53.40	364	46	-87.23	510 976	495 019	-3.12	2.5	618	24182.66
United States of America	2 424 356	2 501 865	3.20	24 646	22 219	-9.85	1 209 219	1 072 184	-11.33	NA	0	—

^a Based on IEA data from the IEA (2021) World energy balances data service, www.iea.org/data-and-statistics as of 24 June 2021.

^b UNFCCC has included the quantities reported in IEA for 'kerosene type jet fuel' and 'gasoline type jet fuel'.

^c UNFCCC has included the quantities reported in IEA for 'aviation gasoline' and 'motor gasoline'.

^d Geographical coverage of IEA data:

IEA data for Denmark do not include Faroe Islands and Greenland.

IEA data for France includes data for Monaco, but excludes data for the following overseas territories: Guadeloupe, Guyana, Martinique, New Caledonia, French Polynesia, Reunion and Saint Pierre Miquelon.

No IEA data for Liechtenstein are available. These data are not included in the data of Switzerland.

IEA data for the Netherlands are only for the European part.

Table 1.9

Domestic and international navigation - activity data (2019)

	Domestic Navigation						International Navigation						Total					
	Residual fuel oil			Gas / diesel oil			Residual fuel oil			Gas / diesel oil			Residual fuel oil			Gas / diesel oil		
	CRF	IEA ^{a,b}	Difference	CRF	IEA ^{a,b}	Difference	CRF	IEA ^{a,b}	Difference	CRF	IEA ^{a,b}	Difference	CRF	IEA ^{a,b}	Difference	CRF	IEA ^{a,b}	Difference
	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)	(TJ)		(%)
Australia	5 790	5 749	-0.70	14 006	15 538	10.94	29 039	28 836	-0.70	3 491	3 261	-6.58	34 829	34 585	-0.70	17 497	18 800	7.45
Austria	NO	0	-	1 029	25	-97.60	NO	0	-	610	613	0.54	NO	0	-	1 639	638	-61.08
Belarus	NA	0	-	8 303	43	-99.49	NO	0	-	NO	0	-	NA	0	-	8 303	43	-99.49
Belgium	IE	28	-	5 405	6 347	17.44	297 855	293 424	-1.49	49 520	49 407	-0.23	297 855	293 452	-1.48	54 925	55 755	1.51
Bulgaria	NO	0	-	87	0	-	672	672	0.00	2 458	2 475	0.72	672	672	0.00	2 544	2 475	-2.71
Canada	5 674	21 467	278.36	51 545	31 609	-38.68	42 710	18 814	-55.95	78 269	4 686	-94.01	48 384	40 280	-16.75	129 814	36 295	-72.04
Croatia	NO	0	-	2 097	2 097	0.00	193	193	0.00	850	850	0.00	193	193	0.00	2 947	2 947	0.00
Cyprus	NO	0	-	30	38	23.80	6 311	6 346	0.55	5 322	5 302	-0.36	6 311	6 346	0.55	5 352	5 340	-0.22
Czechia	NO	0	-	215	213	-0.83	NO	0	-	NO	0	-	NO	0	-	215	213	-0.83
Denmark (KP)	1 510		-	5 293		-	14 005		-	15 168		-	15 516		-	20 460		-
Denmark (Convention)	1 658	201	-87.88	6 276	4 871	-22.39	14 185	15 067	6.21	16 658	15 542	-6.70	15 843	15 268	-3.63	22 934	20 412	-10.99
Estonia	NO	0	-	225	227	0.71	4 160	4 240	1.92	2 665	2 684	0.71	4 160	4 240	1.92	2 890	2 911	0.71
European Union (KP)	81 471	59 772.6	-26.6	189 122	130 687	-30.9	1 471 652	1 317 809	-10.5	446 349	416 357	-6.7	1 553 123	1 377 581	-11.3	635 471	547 044	-13.9
European Union (Convention)	80 921	59 773	-26.14	187 913	136 005	-27.62	1 470 944	1 424 053	-3.19	444 674	468 641	5.39	1 551 865	1 483 826	-4.38	632 587	604 646	-4.42
Finland	471	480	1.99	3 568	3 578	0.29	10 768	10 880	1.04	2 777	3 067	10.43	11 238	11 360	1.08	6 346	6 646	4.73
France (KP)	599		-	5 100		-	64 292		-	7 003		-	64 891		-	12 104		-
France (Convention)	925	474	-48.75	6 503	7 103	9.22	65 860	64 696	-1.77	7 053	5 930	-15.92	66 785	65 170	-2.42	13 556	13 033	-3.86
Germany	358.3	0	-	21 556	11 246	-47.83	26 601	26 720	0.45	18 327	30 076	64.10	26 959	26 720	-0.89	39 883	41 322	3.61
Greece	14 581	14 360	-1.51	12 032	12 446	3.44	89 417	88 804	-0.69	15 768	16 336	3.60	103 998	103 164	-0.80	27 800	28 781	3.53
Hungary	NO	0	-	214	213	-0.33	NE	0	-	NE	0	-	NO	0	-	214	213	-0.33
Iceland	195	193	-0.99	512	506	-1.16	781	773	-0.99	1 948	1 925	-1.16	976	966	-0.99	2 460	2 431	-1.16
Ireland	NO	0	-	3 742	3 681	-1.64	429	416	-2.99	5 521	5 431	-1.64	429	416	-2.99	9 263	9 112	-1.64
Italy	26 359	15 086	-42.77	28 950	10 139	-64.98	80 503	88 037	9.36	3 067	21 812	611.09	106 862	103 123	-3.50	32 017	31 951	-0.21
Japan	IE	88 755	-	5 907	42 293	615.92	IE	182 116	-	1 235	5 280	327.65	IE	270 871	-	7 142	47 573	566.09
Kazakhstan	NO	0	-	90	0	-	NO	0	-	57	41	-27.75	NO	0	-	147	41	-72.11
Latvia	NO	0	-	132	69	-47.88	1 727	1 701	-1.49	10 523	10 550	0.26	1 727	1 701	-1.49	10 655	10 619	-0.34
Liechtenstein	NO	0	-	NO	0	-	NO	0	-	NO	0	-	NO	0	-	NO	0	-
Lithuania	NO	0	-	221	222	0.24	4 719	4 796	1.63	3 381	3 361	-0.59	4 719	4 796	1.63	3 602	3 583	-0.54
Luxembourg	NO	0	-	12	0	-	NO	0	-	1.4	0	-	NO	0	-	13	0	-
Malta	NO	0	-	338	338	0.00	78 473	78 473	0.00	16 247	16 247	0.00	78 473	78 473	0.00	16 585	16 585	0.00
Monaco	NO	0	-	11		-	NO		-	109		-	NO	0	-	120		-
Netherlands	NO	0	-	11 749	11 454	-2.51	385 220	375 807	-2.44	109 045	105 322	-3.41	385 220	375 807	-2.44	120 794	116 776	-3.33
New Zealand	4 497	1 997	-55.58	NO	2 421	-	11 937	11 745	-1.61	1 906	1 927	1.09	16 434	13 742	-16.38	1 906	4 348	128.12
Norway	134	132	-1.46	31 714	23 570	-25.68	1 447	1 426	-1.48	4 917	4 856	-1.23	1 581	1 558	-1.48	36 631	28 427	-22.40
Poland	NO	0	-	131	78	-40.58	3 290	3 224	-2.01	8 254	8 178	-0.93	3 290	3 224	-2.01	8 386	8 256	-1.55
Portugal	2 517	2 503	-0.54	1 013	1 095	8.16	33 245	33 259	0.04	6 707	6 531	-2.62	35 762	35 762	0.00	7 720	7 626	-1.21
Romania	NO	0	-	1 825	1 825	0.00	NO	0	-	1 432	1 432	0.00	NO	0	-	3 257	3 257	0.00
Russian Federation	7 890	7 860	-0.38	11 474	17 106	49.09	371 782	88 480	-76.20	60 727	364 014	499.43	379 672	96 340	-74.63	72 201	381 121	427.86
Slovakia	NO	0	-	56	0	-	NO	0	-	213	0	-	NO	0	-	270	0	-
Slovenia	NO	0	-	1	0	-	6 770	6 599	-2.53	1 203	1 203	0.00	6 770	6 599	-2.53	1 204	1 203	-0.08
Spain	23 692	23 400	-1.23	19 571	19 596	0.13	231 377	228 520	-1.23	67 672	67 904	0.34	255 069	251 920	-1.23	87 243	87 500	0.30
Sweden	3 519	3 240	-7.92	3 245	2 544	-21.59	68 341	62 920	-7.93	20 331	20 284	-0.23	71 859	66 160	-7.93	23 576	22 828	-3.17
Switzerland	NO	0	-	1 004	649	-35.38	NO	0	-	200	111	-44.24	NO	0	-	1 204	760	-36.85
Turkey	1 479	1 400	-5.35	15 084	14 825	-1.72	31 022	30 720	-0.97	6 164	6 177	0.21	32 501	32 120	-1.17	21 248	21 002	-1.16
Ukraine	NO	0	-	1 138	5 613	393.15	NO	0	-	710	0	-	NO	0	-	1 848	5 613	203.70
United Kingdom of Great Britain and Northern Ireland (KP)	7 670		-	60 774		-	62 503		-	70 334		-	70 173	0	-	131 108	0	-
United Kingdom of Great Britain and Northern Ireland (Convention)	7 689	0	-	60 774	36 561	-39.84	62 501	29 260	-53.18	70 334	68 102	-3.17	70 190	29 260	-58.31	131 108	104 663	-20.17
United States of America	206 798	14 353	-93.06	255 434	146 753	-42.55	354 738	522 967	47.42	143 757	427 021	197.04	561 536	537 320	-4.31	399 191	573 774	43.73

^a Based on IEA data from the IEA (2021) World energy balances data service, www.iea.org/data-and-statistics as of 24 June 2021.

^b Geographical coverage of IEA data:

IEA data for Denmark does not include Faroe Islands and Greenland.

IEA data for France includes data for Monaco, but excludes data for the following overseas territories: Guadeloupe, Guyana, Martinique, New Caledonia, French Polynesia, Reunion and Saint Pierre Miquelon.

No IEA data for Liechtenstein are available. These data are not included in the data of Switzerland.

IEA data for the Netherlands are only for the European part.

Table 1.10**Fugitive emissions from fuels: coal mining and handling - CH₄ (2019)**

	Share of national total ^a	Methods and EF used		Activity data					CH ₄ IEF			
				CRF			IEA ^b		Underground mines		Surface mines	
		Methods	EF	Underground mines	Surface mines	Total	Total	Difference	Mining activities	Post-mining activities	Mining activities	Post-mining activities
				(Mt)					(kg/t)			
IPCC default EF ^c	(%)							(%)	12.06 (6.70-16.75)	1.68 (0.60-2.68)	0.8 (0.20-1.34)	0.07 (0-0.13)
Australia	4.12	T2, T3	CS, PS	104	521	624	504	-19.29	5.4	0.40	0.51	IE, NA
Austria				NO	NO	NO	0	–	NO	NO	NO	NO
Belarus							0	–				
Belgium	0.03	D	D	NO	NO	NO	0	–	NO	NO	NO	NO
Bulgaria	1.45	T1, T2	CS, D	NO	28	28	28	0.00	NO	NO	0.80	0.067
Canada	0.19	CS	CS	427.99	70 737	71 165	56	-99.92	0.0	IE, NO	0.001	IE, NO
Croatia				NO	NO	NO	0	–	NO	NO	NO	NO
Cyprus					NO	NO	0	–			NO	NO
Czechia	1.82	T1, T2	CS, D	3.4	37	41	41	0.00	8.1	1.7	1.3	0.067
Denmark (KP)				NO	NO	NO		–	NO	NO	NO	NO
Denmark (Convention)				NO	NE, NO	NE, NO	0	–	NO	NO	NE, NO	NE, NO
Estonia				NO	NO	NO	0	–	NO	NO	NO	NO
European Union (KP)	0.61			70	305	375	161	-57.1	6.6	1.6	0.51	0.030
European Union (Convention)	0.61			70	305	375	375	-0.13	6.6	1.6	0.51	0.030
Finland				NO	NO	NO	0	–	NO	NO	NO	NO
France (KP)	0.00	T2, T3	CS, PS	NO	NO	NO		–	NO	NO	NO	NO
France (Convention)	0.00	T2, T3	CS, PS	NO	NO	NO	0	–	NO	NO	NO	NO
Germany	0.01	T2, T3	CS	NO	131	131	131	0.00	NA, NO	NA, NO	0.011	IE, NA
Greece	0.70	T1	D	NO	27	27	27	0.00	NO	NO	0.87	IE, NO
Hungary	0.05	T1, T2	CS, D	NO	6.8	6.8	6.8	0.00	NO	NO	0.01	0.001
Iceland				NO	NO	NO	0	–	NO	NO	NO	NO
Ireland	0.03	T1	D	NO	NO	NO	0	–	NO	NO	NO	NO
Italy	0.00	T2	D	NO	NO	NO	0	–	NO	NO	NO	NO
Japan	0.04	T1, T2, T3	CS, D	0.22	0.55	0.78	0.8	0.00	4.1	1.7	0.80	0.067
Kazakhstan	1.98	T1	D	10	94	105	105	-0.24	16.0	2.7	0.80	0.067
Latvia				NO	NO	NO	0	–	NO	NO	NO	NO
Liechtenstein				NO	NO	NO		–	NO	NO	NO	NO
Lithuania				NO	NO	NO	0	–	NO	NO	NO	NO
Luxembourg				NO	NO	NO	0	–	NO	NO	NO	NO
Malta				NO	NO	NO	0	–	NO	NO	NO	NO
Monaco				NO	NO	NO		–	NO	NO	NO	NO
Netherlands				NO	NO	NO	0	–	NO	NO	NO	NO
New Zealand	0.16	T1, T2	CS, D	0.16	2.9	3.0	3.0	0.00	17	1.6	0.80	0.067
Norway	0.14	T2	CS	0.12	0.12	0.24	0.12	-48.98	7.2	IE, NO	0.54	IE, NO
Poland	3.71	T1, T3	D	62	50	112	112	0.00	6.7	1.7	0.80	0.067
Portugal	0.02	NO	NO	NO	NO	NO	0	–	NO	NO	NO	NO
Romania	4.93	T1, T2	D	0.41	21	22	22	0.00	12	1.7	0.80	0.067
Russian Federation	3.22	T1, T2	CS, D	107	334	441	439	-0.43	12	2.0	3.7	0.13
Slovakia	0.61	T2	CS	1.4	NO	1.4	1.5	2.38	5.7	0.60	NO	NO
Slovenia	1.26	T2, T3	CS, D, PS	3.1	NO	3.1	3.1	0.00	2.0	0.67	NO	NO
Spain	0.01	CS, T2	CS	NO	NO	NO	0	–	NO	NO	NO	NO
Sweden				NO	NO	NO	0	–	NO	NO	NO	NO
Switzerland				NO	NO	NO	0	–	NO	NO	NO	NO
Turkey	1.34	T1	D	14	73	87	87	0.00	12	1.7	0.80	0.067
Ukraine	3.75	T1, T2, T3	CS, D, M	46	C	C	26	–	11	1.2	C	C
United Kingdom of Great Britain and Northern Ireland (KP)	0.11	T2, T3	CS	0.099	2.6	2.7		–	13	1.2	0.34	IE, NO
United Kingdom of Great Britain and Northern Ireland (Convention)	0.11	T2, T3	CS	0.099	2.6	2.7	2.2	-19.28	13	1.2	0.34	IE, NO
United States of America	0.81	T2, T3	CS	243	398	640	640	0.00	8.3	0.85	0.64	0.14

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b Based on IEA data from the IEA (2021) World energy balances data service, www.iea.org/data-and-statistics as of 24 June 2021

^c Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 4 Fugitive Emissions, pages 4.12 to 4.19. (Tier 1).

Table 1.11a**Fugitive emissions from fuels: oil and natural gas - CH₄, CO₂ (2019)**

	CH ₄			CO ₂		
	Share of national total ^a	Methods and EF used		Share of national total ^a	Methods and EF used	
		Methods	EF		Methods	EF
	(%)			(%)		
Australia	1.51	T1, T2	CS, D, PS	3.33	T1, T2	CS, D, PS
Austria	0.29	T1, T2	CS, D	0.15	T1, T2	CS, D
Belarus	0.91	T1	D	0.00	T1	D
Belgium	0.43	CS, D	CS, D	0.10	T1	D
Bulgaria	0.43	T1	D	1.44	T1	D
Canada	4.98	CS	CS	2.18	CS	CS
Croatia	0.70	T1	D	0.86	CS, T1	CS, D
Cyprus	–			0.00		
Czechia	0.48	T1, T2	CS, D	0.00	T1, T2	CS, D
Denmark (KP)	0.17	T2, T3	CS, D, OTH, PS	0.44	T2, T3	CS, D, PS
Denmark (Convention)	0.16	T2, T3	CS, D, OTH, PS	0.42	T2, T3	CS, D, PS
Estonia	0.14	T1	D	0.00	T1	D
European Union (KP)	0.62			0.48		
European Union (Convention)	0.62			0.48		
Finland	0.05	T1, T2	CS, D, PS	0.12		
France (KP)	0.23	T1, T2, T3	CS, D, PS	0.59	T1, T2, T3	CS, D, PS
France (Convention)	0.22	T1, T2, T3	CS, D, PS	0.58	T1, T2, T3	CS, D, PS
Germany	0.62	T2, T3	CS	0.17	CS, T2	CS
Greece	0.15	T1	D	0.01	T1	D
Hungary	2.45	T1, T2	CS	0.19	T1	CS, D
Iceland	0.01	T1	D	0.00	T1	D
Ireland	0.10	T1, T3	CS, D, PS	0.00	T3	CS
Italy	0.99	T1, T2	CS, D	0.61	T1, T2	CS, D
Japan	0.02	CS, T1	CS, D	0.02	T1	D
Kazakhstan	1.30	T1	CS, D	0.00	T1	D
Latvia	0.88	T3	CS	0.00	T3	CS
Liechtenstein	0.63	T3	CS	0.00		
Lithuania	1.44	T1, T2	CS, D	1.15	T1, T2, T3	CS, D, PS
Luxembourg	0.29	T1	D	0.00	T1	D
Malta	–			0.00		
Monaco	0.66	T3	CS	0.00	T3	CS
Netherlands	0.25	T1, T1b, T3	CS, D	0.55	CS, T1, T2, T3	CS, D, PS
New Zealand	0.50	T1, T3	CS, D	0.53	T1, T2, T3	CS, D
Norway	0.89	T2	CS, PS	3.31	T2	CS, PS
Poland	0.73	T1	CS, D	0.02	T1	CS, D
Portugal	0.09	CR, OTH	CR, OTH	1.72	D	D
Romania	2.26	T1	D	0.53	T1, T2	CS, D
Russian Federation	4.76	T1b, T2	CS, D	2.21	T1b, T2	CS, D
Slovakia	0.53	T1, T3	CS	0.00	T1	CS
Slovenia	0.23	T1	D	0.00	T1	D
Spain	0.05	CS, T1	CS, D	1.15	CS, T1, T2	CS, D, PS
Sweden	0.11	T1, T2, T3	CS, D, PS	1.04	T2, T3	CS, PS
Switzerland	0.40	T1, T2	CS, D	0.07	T2	CS
Turkey	0.54	T1	D	0.04	T1	D
Ukraine	9.97	T1, T2	CS, D	0.64	T1, T2	CS, D
United Kingdom of Great Britain and Northern Ireland (KP)	1.01	T2, T3	CS, PS	0.93	T2, T3	CS, PS
United Kingdom of Great Britain and Northern Ireland (Convention)	1.01	T2, T3	CS, PS	0.93	T2, T3	CS, PS
United States of America	3.10	CS	CS	1.29	CS	CS

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

Table 1.11b

Fugitive emissions from fuels: oil and natural gas - oil - CH₄, CO₂ (2019)

	Oil											
	Exploration				Production				Transport			
	CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data		CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data		CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data	
	kg/unit		Unit	Description	kg/unit		Unit	Description	kg/unit		Unit	Description
IPCC default EF ^b			10 ³ m ³	total oil production					(5.4)(PL) (25)(TT)			
Australia	0.33	3 200	t	Quantity of Oil Flare ^c	1 793	NA, NO	PJ	Crude Oil and ORF Produced	86	NA, NO	PJ	Crude oil transport domestic
Austria	1E	1E, NO	Mt	Mt crude oil	1E	1E, NO	Mt	Mt crude oil	5.4	0.49	Mt	1000 m ³ crude oil
Belarus	NO	NO	NE	number of wells drilled	29 891	5 566	PJ	PJ of oil produced	111	10	PJ	PJ oil loaded in tankers
Belgium	NO	NO	PJ		NO	NO	PJ		150	14	PJ	
Bulgaria	20	4 400	103m3	Indigenous production	2 910	44 990	103m4	Indigenous production	25	2.3	103m3	Indigenous production
Canada	1E	1E, NO	NA	NA	1 022	3 042	10 ³ m ³	Total crude production	0.073	0.10	10 ³ m ³	Total crude production
Croatia	194	9 102	1001 m3	total oil production	2 546	41 225	1000 m3	total oil production	5.4	0.49	1000 m3	total oil transported by pipelines
Cyprus	NO	NO	NO		NO	NO	NO		NO	NO	NO	
Czechia	NE	NE	PJ	(e.g. number of wells drilled)	4 702	8 860	PJ	(e.g. PJ of oil produced)	146	13	PJ	(e.g. PJ oil loaded in tankers)
Denmark (KP)	NO	NO	m3	Oil explored	0.59	0.043	10 ³ m3	Oil produced	0.016	NA, NO	Mg	Oil loaded
Denmark (Convention)	NO	NO	dnm:m3 grl:NO fro:NO		0.59	0.043	dnm:10 ³ m3 grl:NO fro:NO		0.016	NA, NO	dnm:Mg grl:NO fro:NO	
Estonia	NO	NO	NA	Exploration	NO	NO	NA	Production	NO	NO	NA	Transport
European Union (KP)												
European Union (Convention)												
Finland	NO	NO	NO		NO	NO	NO		NO	NO	NO	
France (KP)	5 373	252 097	PJ	Oil produced	54 578	7 201	PJ	Oil produced	58	5.3	PJ	Oil loaded
France (Convention)	NE	NE	PJ	Preliminary Tier 1 calculations have demonstrated that for the entire inventory period such emissions are far below 500 kt CO ₂ e and represent less than 0.05 percents of the total greenhouse gas emissions of France.	54 578	7 201	PJ	Oil produced	58	5.3	PJ	Oil loaded
Germany	64	0.48	number	Number of wells drilled	0.017	0.13	t	oil produced	0.007	NA, NO	t	oil transported
Greece	NE	NE, NO	kt		0.69	0.050	kt		27	NE, NO	kt	
Hungary	1E	1E, NO	NA		1 801	130	1000 m3	conventional oil production (thousand m3)	9.6	50	1000 m3	Oil transported by pipeline (thousand m3)
Iceland	NO	NO			NO	NO			NO	NO		
Ireland	NO	NO	PJ		NO	NO	PJ		NO	NO	PJ	
Italy	NO	NO	NA	Wells drilled	1 872	321	Gg	Oil produced	6.2	0.56	Gg	Oil transported
Japan	1E	1E, NO			1 368 347	98 825	10 ⁶ m ³	Oil produced	70 005	4 894	10 ⁶ m ³	Oil & condensate produced
Kazakhstan	0	0	10 ⁶ m ³	Oil produced	2 138	154	t	Oil produced	6.605	0.86	t	Oil produced
Latvia	NO	NO	kt	Exploration	NO	NO	kt	Production	NO	NO	kt	Transport
Liechtenstein	NO	NO	NO	number of wells drilled	NO	NO	NO	oil produced	NO	NO	NO	oil loaded in tankers
Lithuania	194	9 102	thous.m3	Oil produced	1.5	0.11	thous.m3	Oil produced, thous.m3	5.4	0.49	thous.m3	Oil transported, thous.m3
Luxembourg	NO	NO	NA	number of wells drilled	NO	NO	NA	oil produced	NO	NO	NA	oil loaded in tankers
Malta	NO	NO	NO	number of wells drilled	NO	NO	NO	oil produced	NO	NO	NO	oil loaded in tankers
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	1E	1E, NO	NA		1E	1E, NO	NA		5.8	0.53	Gg	
New Zealand	0.000	0.43	number of wells drilled		0.001	0.000	m3		0.030	0.003	m3	
Norway	1E	1E, NO	Number of wells	Exploration wells	1E	1E, NO	10 ³ m ³	Oil produced	1 490	28 197	PJ	Oil loaded in tankers
Poland	NA	NA	NA	NA	78 120	5 642	PJ	Production	6.3	0.57	Gg	oil transported by pipeline
Portugal	NO	NO	NO		NO	NO	NO		6 375 442 739	578 512	Mt	
Romania	5 541	259 989	PJ	oil produced	62 841	7 998	PJ	oil produced	149	14	PJ	oil refined
Russian Federation	194	9 102	10 ³ m3	Oil produced	1 801	130	10 ³ m3	Oil and Condensate produced	5.4	0.49	10 ³ m3	Oil transported by pipeline
Slovakia	NO	NO	NO		3 600	260	kt	Production	5.4	0.49	kt	Transfer
Slovenia	NO	NO	1000 m3	NA	1	0	1000 m3	Conventional oil produced	NA	430	1000 m3	Consumption of LPC
Spain	NA	NA, NO	Tg	Crude oil produced	797	64	Tg	Crude oil produced	578	52	Tg	Transport of crude oil
Sweden	C	C, NA	TJ	Consumption of feedstock	NO	NO		Oil production	745	NE	PJ	Transported amount of oil
Switzerland	NO	NO			NO	NO			1.0	NA, NO	Number	Number of refineries/pipelines
Turkey	NO	NO	NO		3 600	260	10 ³ m ³	oil production	4.5	72	10 ³ m ³	oil transported by pipeline
Ukraine	747	80 400	10 ³ m ³	Oil Produced	30 001	2 150	10 ³ m ³	oil produced	5.4	0.49	10 ³ m ³	Crude oil transported by pipeline
United Kingdom of Great Britain and Northern Ireland (KP)	25	3 200	t	Exploration drilling: fuel use	1 203	65 218	PJ	Oil produced	0.012	NO	t	Oil loading
United Kingdom of Great Britain and Northern Ireland (Convention)	25	3 200	t	Exploration drilling: fuel use	1 203	65 218	PJ	Oil produced	0.012	NO	t	Oil loading
United States of America	2 408	465 556	10 ⁶ Bbl(oil US)	Annual Domestic Production	337 113	8 984 978	10 ⁶ Bbl(oil US)	Annual Domestic Production	1 517	216	10 ⁶ Bbl(oil US)	Refinery Feed

^a The units of the implied emission factors (IEF) vary from Party to Party depending on the unit of the activity data used. The unit of the IEF is kg/unit of activity data.^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 4 Fugitive Emissions. Table 4.2.4. Tier 1 Emission Factors in developed countries. Values converted from Gg to kg.

Table 1.11c

Fugitive emissions from fuels: oil and natural gas - natural gas - CH₄, CO₂ (2019)

	Natural Gas															
	Production				Processing				Transmission and Storage				Distribution			
	CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data		CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data		CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data		CH ₄ IEF ^a	CO ₂ IEF ^a	Activity data	
	kg/unit		Unit	Description	kg/unit		Unit	Description	kg/unit		Unit	Description	kg/unit		Unit	Description
IPCC default E ^b	(380 to 2300)	(140 to 820)	10 ⁻⁶ m ³	Gas produced	(150 to 1030)	(12 to 320)	10 ⁻⁶ m ³	Gas produced	(66-480)(T) (25)(S)	(0.88)(T) (0.11)(S)	10 ⁻⁶ m ³	marketable gas	1 100	51	10 ⁻⁶ m ³	utility sales
Australia	4 506	86	PJ	Natural gas produced	6 347	1 195	PJ	Natural gas produced	NA	NA	NA	Length of Pipeline	184 671	10 509	PJ	Utility sales
Austria	3 994	65 095	Mm3	Mm3 natural gas	NA	67 340	Mm3	Mm3 natural gas	520	25	km	km pipeline length	49	2.3	km	km distribution network length
Belarus	126 818	4 154	PJ	PJ gas produced	IE	IE, NO	NE		25	0.99	10 ⁻⁶ m ³	Gas consumed	1 100	51	10 ⁻⁶ m ³	Gas consumed
Belgium	NO	NO	PJ		NO	NO	PJ		8 229	NA, NO	PJ		23 092	743	NO	PJ
Bulgaria	2 540	3 600	106m3	Indigenous production	570	7 210	106m3	Indigenous production	2 117	255	km	Pipeline length	230	10	km	Pipeline length
Canada	437	13	10 ⁻⁶ m ³	Natural gas production	57	41	10 ⁻⁶ m ³	Natural gas production	575	410	km	Transmission pipeline length	144	7.4	km	Distribution pipeline length
Croatia	1 341	154 578	1000000 m3	gas produced	592	3 166	1000000 m3	gas produced	480	4.1	1000000 m3	marketable gas	1 100	51	1000000 m3	utility sales
Cyprus	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO	
Czechia	38 145	15	PJ	(e.g. PJ gas produced)	NA	NA, NO	PJ		4 906	20	PJ	(e.g. PJ gas consumed)	127 186	507	PJ	(e.g. PJ gas consumed)
Denmark (KP)	380	14	10 ⁻⁶ m ³	Gas produced	NA	NA	10 ⁻⁶ m ³	Gas produced	38	0.88	10 ⁻⁶ m ³	Gas transmission	49	0.95	10 ⁻⁶ m ³	Gas distributed
Denmark (Convention)	380	14	dm:10 ⁻⁶ m ³ gr:10 ⁻⁶ m ³		NA, NO	NA, NO	dm:10 ⁻⁶ m ³ gr:10 ⁻⁶ m ³		38	0.88	dm:10 ⁻⁶ m ³ gr:10 ⁻⁶ m ³		49	1.0	dm:10 ⁻⁶ m ³ gr:10 ⁻⁶ m ³	
Estonia	NO	NO	NA	Production	NO	NO	NA	Processing	5 735	30	PJ	Amount of the transmission of Natural Gas	38 001	1 762	PJ	Amount of natural gas distributed
European Union (KP)																
European Union (Convention)																
Finland	NO	NO	NO		NO	NO	NA		3 924	NE, NO	PJ	PJ gas consumed	36 142	NE, NO	PJ	PJ gas distributed
France (KP)	IE	IE, NO	PJ	NO	304	5 361 447	PJ	Gas processed	8 380	87	PJ	Gas consumed	15 022	156	PJ	Gas consumed
France (Convention)	IE	IE, NO	PJ	NO	304	5 361 447	PJ	Gas processed	8 380	87	PJ	Gas consumed	15 022	156	PJ	Gas consumed
Germany	0.045	0.11	1000 m ³	gas produced	0.020	103	1000 m ³	gas produced	2 212	9.4	km	length of transmission pipelines	178	1.3	km	length of distribution pipelines
Greece	1 930	214	mil m3		IE	IE, NO	mil m3		298	0.99	mil m3		1 100	51	mil m3	
Hungary	1 340	48	million m3	Gas production (million m3)	935	250	million m3	Sweet gas plants-raw gas feed (million m3)	972	0.99	million m3	Marketable gas (million m3)	440	5.2	km	length of pipelines
Iceland	NO	NO			NO	NO			NO	NO			NO	NO		
Ireland	60	NE, NO	PJ		IE	NE, NO	PJ		1 855	30	PJ		14 668	241	PJ	
Italy	906	82	Mm3	Gas produced	406	320	Mm3	Gas produced	331	6.3	Mm3	Gas transported	3 781	72	Mm3	Gas distributed
Japan	2 239	79	10 ⁻⁶ m ³	Gas produced	755	235	10 ⁻⁶ m ³	Gas produced	233	NA, NO	10 ⁻⁶ m ³	Gas sold	10	NA, NO	10 ⁻⁶ m ³	City gas sold
Kazakhstan	134	48	10 ⁻⁶ m ³	(Gas produced)	0.59	0.17	10 ⁻⁶ m ³	(Gas produced)	298	0.99	bln m3	(Gas produced)	11	51	bln m3	(Gas produced)
Latvia	NO	NO	m3	Production	NO	NO	m3	Processing	0.68	0.002	m3	Transmission and storage	0.65	0.002	m3	Distribution
Liechtenstein	NO	NO	NO	gas produced	NO	NO	NO	gas produced	164	1.3	km	gas consumed	48	0.38	TJ	gas consumed
Lithuania	NO	NO	NO		NO	NO	NO		948 571	614	kt	Natural gas leakages	948 571	614	kt	Natural gas leakages
Luxembourg	NO	NO	NA	gas produced	NO	NO	NA	NO	13	0.024	TJ	gas consumed	30	1.4	TJ	gas consumed
Malta	NO	NO	NO	gas produced	NO	NO	NO	gas processed	NO	NO	NO	gas consumed	NO	NO	NO	gas consumed
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	0.72	0.012	m	CH4	NO	NO	NO	NO
Netherlands	IE	IE, NO	mln m3	Gas produced	IE	IE, NO	NA		1 353	25	PJ	Gas transmitted	43 868	1 350	10 ⁻³ km	Length distribution network
New Zealand	1 115	40	1E6 m3		NE	NE, NO	NA	Not significant.	503 453	52 872	TJ		14 092	2 140	TJ	
Norway	IE	IE, NO	10 ⁻⁶ m ³	Gas produced	IE	IE, NO	PJ	Gas processed	IE	IE, NO	PJ	Gas export	44 507	IE, NO	PJ	Gas consumption
Poland	2 291	82	10 ⁻⁶ m3	Production	1 030	320	10 ⁻⁶ m3		505	0.99	10 ⁻⁶ m3	gas consumed	1 100	51	10 ⁻⁶ m3	gas consumed
Portugal	NO	NO	NO		NO	NO	NO		11	0.21	toe NG Transmitted		1 152	22	toe NG Distributed	
Romania	1 340	48	106m4	gas produced	590	166	106m4	gas produced and processed	228	0.74	106m4	gas produced	1 100	51	106m3	gas supplied
Russian Federation	213	4.3	10 ⁻⁶ m ³	Natural Gas produced	IE	IE, NO	10 ⁻⁶ m ³	Natural Gas produced	1 865	7.5	10 ⁻⁶ m ³	Marketable gas	1 100	51	10 ⁻⁶ m ³	Gas consumed
Slovakia	2 300	82	mil m3	Production/Processing	1 030	320	mil m3		12	0.88	mil m3	Transfer	1 100	51	mil m3	Distribution
Slovenia	1.3	0.048	1000 m3	Gas production	NO	NO	1000 m3	NA	0.37	0.001	1000 m3	Marketable gas	1.1	0.051	1000 m3	Utility sale
Spain	2 242	80	Mm3	Mm3 gas produced	150	12	Mm3	Mm3 gas produced	1 374	23	PJ	PJ gas (NCV)	2 740	46	PJ	PJ of gaseous fuels (natural gas)
Sweden	NO	NO		Gas produced	NO	NO		Gas produced	NA	NA	km	Length of transmission pipelines	NA	NA	km	Length of distribution pipelines
Switzerland	NO	NO	PJ	Amount of natural gas produced	NO	NO			17 906 000	592 000	PJ	Losses of natural gas in transit pipeline	17 906 000	592 000	PJ	Losses of natural gas in distribution network
Turkey	2 300	82	10 ⁻⁶ m ³	Natural gas production	1 030	320	10 ⁻⁶ m ³	Natural gas production	458	0.84	10 ⁻⁶ m ³	Natural gas transmission by pipeline	1 100	51	10 ⁻⁶ m ³	Natural gas distribution
Ukraine	12 190	97	10 ⁻⁶ m ³	Natural Gas Produced	790	250	10 ⁻⁶ m ³	Natural Gas Processed	268 219	6 186	Mt	gas transmitted	25 002 133	384 417	10 ⁻⁹ m ³	The volume of natural gas
United Kingdom of Great Britain and Northern Ireland (KP)	IE	IE, NO	PJ	Gas produced	1 323	183 144	PJ	Gas produced	6.0	0.26	GWh	Natural gas supply	9 441	404	GWh	Natural gas supply
United Kingdom of Great Britain and Northern Ireland (Convention)	IE	IE, NO	PJ	Gas produced	1 323	183 144	PJ	Gas produced	6.0	0.26	GWh	Natural gas supply	9 441	404	GWh	Natural gas supply
United States of America	110 335 723	322 400 477	10 ⁻⁹ ft ³	Annual Production	14 645 644	729 679 553	NA	Annual Production	47 536 398	40 012 950	10 ⁻⁹ ft ³	Consumption	18 003 161	530 072	10 ⁻⁹ ft ³	Consumption

^a The units of the implied emission factors (IEF) vary from Party to Party depending on the unit of the activity data used. The unit of the IEF is kg/unit of activity data.^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 4 Fugitive Emissions, Table 4.2.4, Tier 1 Emission Factors in developed countries. Values converted from Gg to kg.

Table 1.11d
Fugitive emissions from fuels: oil and natural gas - venting and flaring - CH₄, CO₂ (2019)

	Venting and flaring																						
	Oil								Gas														
	Venting				Flaring				Venting				Flaring										
	CH ₄ IEF*	CO ₂ IEF*	Activity data		CH ₄ IEF*	CO ₂ IEF*	Activity data		CH ₄ IEF*	CO ₂ IEF*	Activity data		CH ₄ IEF*	CO ₂ IEF*	Activity data								
	kg/unit	unit	Description	kg/unit	unit	Description		kg/unit	unit	Description	kg/unit	unit	Description	kg/unit	unit	Description							
IPCC default EF ^a																							
Australia	IE	IE, NO	NA	NA	34 903	2 900 863	kt	Quantity of Gas Flared	13 129	PJ	Natural gas, crude oil and ORF produced	4 762	2 706 563	kt	Natural gas, crude oil and ORF produced	NA	NA, NO	NA	NA	NO	NO	NA	NA
Austria	IE	IE, NO	NA	NA	IE	IE, NO	NA	NA	IE	NA	NA	IE	IE, NO	NA	NA	IE	IE, NO	NA	NA	IE	IE, NO	NA	NA
Belarus	IE	IE, NO	10 ⁻⁶ m ³	Oil produced	IE	IE, NO	10 ⁻⁶ m ³	Oil consumption	IE	10 ⁻⁶ m ³	Gas produced	IE	IE, NO	10 ⁻⁶ m ³	Gas consumption	IE	IE, NO	10 ⁻⁶ m ³	Venting	0.004	0.64	10 ⁻⁶ m ³	Flaring
Belgium	NO	IE, NO	NO	PJ	NO	NO	PJ	Not Applicable	43	NO	PJ	NO	IE, NO	NO	NO	NO	NO	PJ	NO	IE	NA	NO	PJ
Bulgaria	IE	IE	NA	Indigenous production	1	55 564	TJ	Natural gas used for hydrogen production in oil refineries	IE	NA	Indigenous production	IE	IE	106m3	Indigenous production	NO	NO	PJ	NO	NO	NO	NO	PJ
Canada	2 574	36 115	10 ⁻³ m ³	Total crude production	10 642	3 097 391	10 ⁻⁶ m ³	Associated gas flares	1 431	10 ⁻⁶ m ³	Natural gas production	13 614	2 450 008	10 ⁻⁶ m ³	Non-associated gas	50	1.2	number	Number of wells drilled	37	5 823	number	Number of wells drilled
Croatia	25	2.3	1000 m3	oil	IE	IE, NO	1000 m3		IE	1000000 m3	gas	IE	IE, NO	1000000 m3		NO	NO	NA	2.3	NO	NO	NO	NO
Cyprus	NO	NO	NO	Fuel transported (m3)	NO	NO	NO		NO	NO		NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO
Czechia	235 590	48 701	PJ	(e.g. PJ oil produced)	568	919 913	PJ	(e.g. PJ gas consumption)	NO	NO	PJ	(e.g. PJ gas produced)	NO	NO	PJ	(e.g. PJ gas consumption)	NO	NO	PJ	NO	NO	NO	PJ
Denmark (KP)	NO	NO	GJ	(e.g. PJ oil produced)	0.018	57	GJ	Refinery gas consumption	17	GJ	Venting in gas terminal	0.018	57	GJ	Gas consumption	NO	NO	GJ	Amount vented	0.26	60	GJ	Gas consumption
Denmark (Convention)	NO	NO	dmcm/GJ grl/NO frs/NO		0.018	57	dmcm/GJ grl/NO frs/NO		17	dmcm/GJ grl/NO frs/NO		0.018	57	dmcm/GJ grl/NO frs/NO		0.26	60	dmcm/GJ grl/NO frs/NO					
Estonia	NO	NO	NA	Oil	NO	NO	NA	Oil	6 287	PJ	Gas	NO	NO	NA	Gas	NO	NO	dmcm/GJ grl/NO frs/NO	Combined	NO	NO	NA	Combined
European Union (KP)																							
European Union (Convention)																							
Finland	NO	NO	NO		1.0	54 785	TJ	used fuels, TJ	NO	NO		IE	IE, NO	NO		NO	NO	NO	NO	NO	NO	NO	NO
France (KP)	19 942	2 631	PJ	Oil produced	13 437	54 280 707	PJ	Gas Flared	IE	Gg	Gas produced	5 624	2 390 768	Gg	Consumption	NO	NO	PJ	Oil and Gas produced	NO	NO	PJ	Consumption
France (Convention)	19 942	2 631	PJ	Oil produced	13 437	54 280 707	PJ	Gas Flared	IE	Gg	Venting emissions are not separately reported by the plant, included within Flaring emission reporting.	5 624	2 390 768	Gg	Consumption	NO	NO	PJ	Oil and Gas produced	NO	NO	PJ	Consumption
Germany	IE	IE, NO	TJ	please refer to other sector	0.3	3 644	kt	oil refined	IE	TJ	please refer to other sector	IE	1 777	1000 m3	amount flared	IE	IE, NO	m3	please refer to other sector	IE	IE, NO	TJ	please refer to other sector
Greece	844	111	kt		29	48 045	kt		182	million m3		2.8	4 200	million m3		NO	NO			NO	NO		
Hungary	720	95	1000 m3	Conventional oil production	219	50 102	1000 m3	Conventional oil production	IE	million m3	Sour gas plants raw gas	2.6	3 891	million m3	Gas production (million m3)	IE	IE, NO	NO	NO	IE	IE, NO	NA	NA
Iceland	NO	NO	NO		NO	NO	NO		NO	NO		NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO
Ireland	NO	NO	PJ		NO	NO	PJ		5 161	PJ		1 000	55 641 565	PJ	Natural gas flaring	NO	NO	PJ		NO	NO	PJ	
Italy	179	2 061	Gg	Oil produced	276	38 926	Gg	Oil produced	NA	MMm3	Gas produced	36	4 200	MMm3	Gas produced	NO	NO	NA	Combined	NO	NO	NA	Combined
Japan	720 000	95 000	10 ⁻⁶ m ³	Oil produced	25 000	41 000 000	10 ⁻⁶ m ³	Oil produced	IE	10 ⁻⁶ m ⁻³	Gas produced in relevant facilities	2.0	3 000	10 ⁻⁶ m ⁻³	Gas produced	IE	IE, NO	NA		NO	NO	NA	Number of wells tested
Kazakhstan	NA	NA	NA	(Gas produced)	IE	IE	IE	NA	0.68	NA	(Gas produced)	IE	IE	IE	NA	NA	NA	NA	1.1	2 150	t	(Gas produced)	
Latvia	NO	NO	kt	Oil	NO	NO	kt	Oil	0.68	m3	Gas	NO	NO	kt	Gas	NO	NO	kt	Combined	NO	NO	kt	Combined
Liechtenstein	NO	NO	NO	Oil produced	NO	NO	NO	gas consumed	NO	NO	gas produced	NO	NO	NO	gas consumed	NO	NO	NO	gas produced	NO	NO	NO	Gas Oil Produced
Lithuania	720	95	thous.m3	Oil produced, thous.m3	25	41 000	thous.m3	Oil produced, thous.m3	NO	NO	gas produced	NO	NO	NO	gas consumed	NO	NO	NO	gas produced	NO	NO	NO	Gas Oil Produced
Luxembourg	NO	NO	NA	oil produced	NO	NO	NA	gas consumed	0.67	NM3	gas produced	NO	NO	NA	gas consumed	NO	NO	NA	combined oil and gas production	NO	NO	NA	combined oil and gas consumption
Malta	NO	NO	NO	oil produced	NO	NO	NO	gas consumed	NO	NO	gas produced	NO	NO	NO	gas consumed	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	IE	IE, NO	10 ⁻⁶ m ³	Oil production	IE	IE, NO	10 ⁻⁶ m ³	Oil production	IE	PJ	Gas Production	IE	IE, NO	PJ	Gas Production	IE	IE	NA	NA	IE	IE	NA	NA
New Zealand	IE	IE	NA	The fields produce both oil and gas and, therefore are reported as combined. Disaggregated data does not exist.	NE	64 708	TJ		NE	NA		IE	IE	NA	The fields produce both oil and gas and, therefore are reported as combined. Disaggregated data does not exist.	14 125	NA, NO	TJ		424	52 707	TJ	
Norway	IE	IE, NO	PJ	(See Venting combined)	9	74 940 898	PJ	Oil flared	IE	PJ	(See Venting combined)	130 304	64 552 054	PJ	Gas flared	899	5 358	PJ	Oil and gas produced	IE	IE, NO	PJ	(See Flaring of Oil/Gas in EU)
Poland	896	171	Gg	oil produced	47 619	29	Gg	oil produced	IE	NA	NA	1 200	17 689	10 ⁻⁶ m3	gas production	NO	NA, NO	NA	NA	NO	NA, NO	NA	NA
Portugal	NO	NO	NO		1 399	2 501 690	kt		NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO	NO
Romania	248 592	51 416	PJ	oil produced	600	971 184	106m3	gas consumed	182	106m3	gas produced	0.76	1 200	106m3	gas consumed	NA	NA, NO	PJ	gas and oil produced	NA	NA, NO	PJ	gas and oil combined
Russian Federation	720	95	10 ⁻³ m3	Oil and Condensate produced	12 000	2 000 000	10 ⁻⁶ m3	Associated gas flaring	IE	10 ⁻⁶ m3	Marketable Gas	0.10	568	10 ⁻⁶ m3	Natural Gas production	NO	NO	NA		NO	NO	NA	
Slovakia	720	95	kt	Venting oil	25	41 000	kt	Flaring oil	24	million m3	Venting gas	2.0	3 000	million m3	Flaring gas	NO	NO	NA		NO	NO	NA	
Slovenia	855	112	1000 m3	Conventional oil produced	30	48 500	1000 m3	Conventional oil produced	0.25	1000 m3	Marketable gas	0.001	1.2	1000 m3	Gas production	NO	NO	1000 m3	NA	NO	NO	1000 m3	NA
Spain	815 402	107 588	Tg	Tg gas venting	145	4 859 925	Tg	Tg gas consumption	144 263 638	PJ	gas produced	60	12 813	MMm3	MMm3 gas consumption	NO	NO	NO	NA	NO	NO	NO	NO
Sweden	IE	IE		Venting of oil products	C	C	TJ	Venting of oil products	0.64	m3	Venting of gas products	1.0	43,624	TJ	Venting of gas products	IE	IE		Venting of combined products	NA	NA		Venting of combined products
Switzerland	NO	NO					PJ		NO	NO		NO	NO	NO	Amount of natural gas produced	NO	NO			NO	NO		
Turkey	720	95	10 ⁻³ m ³	(Oil production	219	50 102	10 ⁻³ m ³	Oil production	31 540	10 ⁻⁶ m ⁻⁴	Natural gas production	2.0	3 000	10 ⁻⁶ m ⁻³	Natural gas production	NO	NO	NO		NO	NO	NO	
Ukraine	855	113	10 ⁻³ m ³	oil produced	29	48 500	10 ⁻³ m ³	oil produced	IE	NA	gas transmission	2.3	3 550	10 ⁻⁶ m ⁻³	Natural Gas Produced	IE	IE, NA	NA	---	IE	IE, NA	NA	---
United Kingdom of Great Britain and Northern Ireland (KP)	NA	NA	NA		11	2 504	t	Amount of gas flared	NA	NA		11	2 319	t	Amount of gas flared	IE	IE, NO	NA		IE	IE, NO	NA	
United Kingdom of Great Britain and Northern Ireland (Convention)	NA	NA	NA		11	2 504	t	Amount of gas flared	NA	NA		11	2 319	t	Amount of gas flared	IE	IE, NO	NA		IE	IE, NO	NA	
United States of America	IE	IE, NA	NA	Production	IE	IE, NA	NA	Production	IE	IE, NA	Production	IE	IE, NA	NA	Production	IE	IE, NA	NA	Production	IE	IE, NA	10 ⁻⁹ B ³	Gas Flared

^a The units of the implied emission factors (IEF) vary from Party to Party depending on the unit of the activity data used. The unit of the IEF is kg/unit of activity data.
^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 4 Fugitive Emissions, Table 4.2.4, Tier 1 Emission Factors in developed countries. Values converted from Gg to kg.

Table 1.12

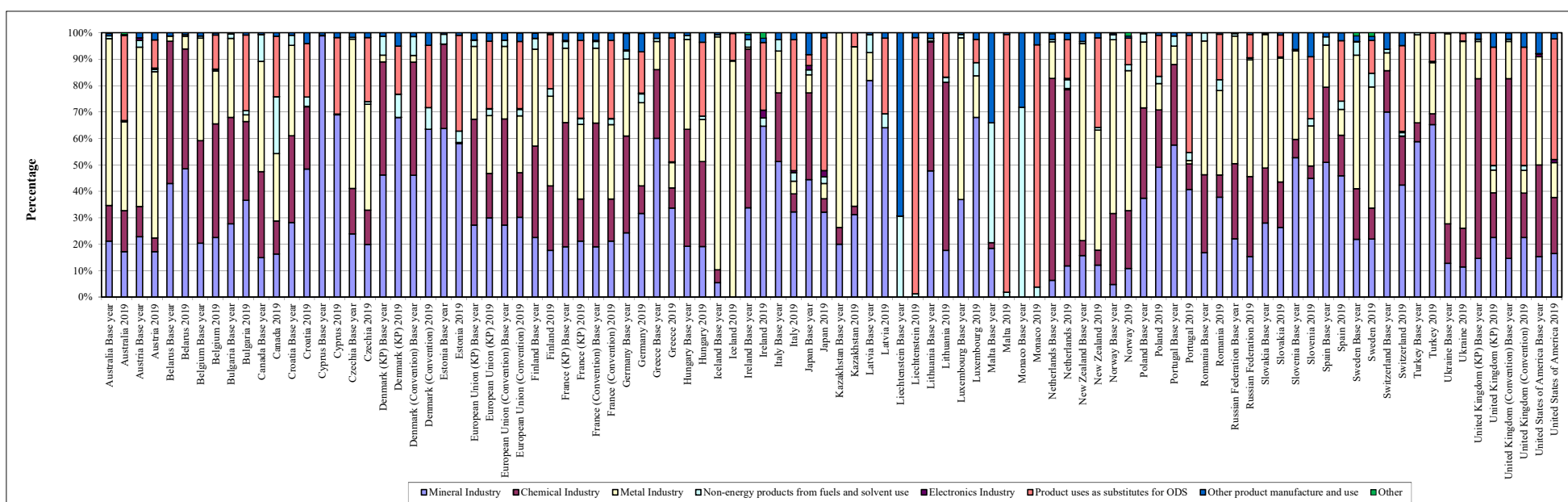
CO₂ transport and storage (2019)

	Transport of CO ₂		Injection and storage		Other	
	CO ₂ IEF	Activity data	CO ₂ IEF	Activity data	CO ₂ IEF	Activity data
	kg/kt	(kt)	kg/kt	(kt)	kg/kt	(kt)
IPCC default EF ^a	(0.00014 to 0.014 Gg/year/km)	10 ³ m ³	n.a.	10 ³ m ³	n.a.	10 ³ m ³
Australia	NO	NO	NO	NO	NO	NO
Austria	NO	NO	NO	NO	NO	NO
Belarus	NO	NO	NO	NO	NO	NO
Belgium	NO	NO	NO	NO	NO	NO
Bulgaria	NO	NO	NO	NO	NO	NO
Canada	77	3 476	2.0	3 476	NA	NA
Croatia	NO	NO	NO	NO	NO	NO
Cyprus	NO	NO	NO	NO		
Czechia	NO	NO	NO	NO	NO	NO
Denmark (KP)	NO	NO	NO	NO	NO	NO
Denmark (Convention)	NO	NO	NO	NO	NO	NO
Estonia	NO	NO	NO	NO	NO	NO
European Union (KP)	IE, NA, NO	IE, NA, NO	IE, NA, NO	NA, NO	NO	NO
European Union (Convention)	IE, NA, NO	IE, NA, NO	IE, NA, NO	NA, NO	NO	NO
Finland	IE, NA	IE, NA	NA	NA	NO	NO
France (KP)	NO	NO	IE	NA	NO	NO
France (Convention)	NO	NO	IE	NA	NO	NO
Germany	NO	NO	NO	NO	NO	NO
Greece	NO	NO	NO	NO	NO	NO
Hungary	NO	NO	NO	NO	NO	NO
Iceland	NO	NO				
Ireland	NO	NO	NO	NO		
Italy	NO	NO	NO	NO	NO	NO
Japan	NA, NO	65	NA, NE	129	NO	NO
Kazakhstan	NO	NO	NA	NA	NO	NO
Latvia	NO	NO	NO	NO	NO	NO
Liechtenstein	NO	NA, NO	NO	NO	NO	NO
Lithuania	NO	NO	NO	NO	NO	NO
Luxembourg	NO	NO	NO	NO	NO	NO
Malta	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO		
Netherlands	NO	NO	NO	NO	NO	NO
New Zealand	NO	NO	NO	NO	NO	NO
Norway	NE, NO	721	426	26 437		
Poland	NO	NO	NO	NO	NO	NO
Portugal	NO	NO	NO	NO	NO	NO
Romania	NO	NO	NO	NO	NO	NO
Russian Federation	NO	NO	NO	NO	NO	NO
Slovakia	NO	NO	NO	NO	NO	NO
Slovenia	NO	NO	NO	NO	NO	NO
Spain	NO	NO	NO	NO	NO	NO
Sweden	NO	NO	NO	NO		
Switzerland	NO	NO	NO	NO	NO	NO
Turkey	NA, NO	NA, NO	NE, NO	NE, NO	NO	NO
Ukraine	NO	NO	NO	NO	NO	NO
United Kingdom of Great Britain and Northern Ireland (KP)	NO	NO	NO	NO		
United Kingdom of Great Britain and Northern Ireland (Convention)	NO	NO	NO	NO		
United States of America	IE	IE	IE	IE	IE, NA	IE

^a Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage. Table 5.2. Tier 1 Emission Factors for pipeline transport of CO₂ from a CO₂ capture site to the final storage site.

Figure 2.1

Contribution of subsectors to total GHG emissions in the Industrial Processes and Product Use sector^{a, b}



^a In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

^b Indirect CO₂ emissions are excluded from the totals in this graph.

Table 2.1

Mineral industry - CO₂ (2019)

	Methods and EF used		Share of national total ^a	Cement production			Lime production		Glass production	
				Activity data		CO ₂ IEF	Share of national total ^a	CO ₂ IEF	Share of national total ^a	CO ₂ IEF
	Methods	EF		Description ^b	Value					
IPCC default EF ^c								0.59-0.86		0.2
Australia	T2	CS	0.56	Clinker Production	5 625	0.54	0.19	0.69		IE, NO
Austria	T1, T3	D, PS	2.22	Cement clinker	3 423	0.52	0.73	0.75	0.05	0.078
Belarus	T1, T2	CS, D	2.52	Used clincer production data	4 352	0.52	0.39	0.75	0.12	0.14
Belgium	T3	CS, PS	2.42	Clinker Production	5 038	0.56	1.20	0.77	0.12	0.097
Bulgaria	T1, T2	CS, D, PS	2.01		2 128	0.53	0.44	0.78	0.14	0.12
Canada	T1, T2, T3	CS, D	0.98	clinker production	13 382	0.54	0.18	0.79	0.01	0.42
Croatia	T2, T3	PS	5.02	clinker production	2 272	0.52	0.39	0.77	0.12	0.43
Cyprus	CS, T1	CS, D	8.92	Clinker production	1 509	0.52	0.04	0.73		NO
Czechia	T1, T3	D, PS	1.60	clinker production	3 722	0.53	0.55	0.76	0.12	0.12
Denmark (KP)	CS, T2, T3	CS, D, PS	2.55	Production of Clinker	2 146	0.53	0.08	0.79	0.02	0.048
Denmark (Convention)	CS, T1, T2, T3	CS, D, PS	2.45	Production of Clinker	2 146	0.53	0.07	0.79	0.02	0.048
Estonia	T1, T2, T3	D, PS	2.01	Clinker production	504	0.59	0.36	0.72	0.07	0.12
European Union (KP)			1.92	Clinker production	147 293	0.53	0.46	0.68	0.11	NE
European Union (Convention)			1.92	Clinker production	147 293	0.53	0.46	0.68	0.11	NE
Finland	T1, T3	CS, D, PS	1.10	Produced clinker	1 142	0.51	0.49	0.80	0.00	0.40
France (KP)	T1, T2, T3	CS, D, PS	1.56	Clinker consumption	13 005	0.52	0.53	0.65	0.12	0.16
France (Convention)	T1, T2, T3	CS, D, PS	1.54	Clinker consumption	13 005	0.52	0.52	0.65	0.12	0.16
Germany	T1, T2	CS, D	1.64	produced clinker	25 069	0.53	0.56	0.75	0.11	0.12
Greece	CS, T1	CS, D, PS	3.92	clinker production	6 429	0.52	0.23	0.85	0.02	0.14
Hungary	T2, T3	CS, D, PS	1.59	Clinker production (kt)	C	C	0.22	0.75	0.08	0.14
Iceland	T3	PS		clinker production	NO	NO		NO		NO
Ireland	T3	PS	3.17	clinker production	3 462	0.55	0.27	0.76		NO
Italy	T2	CS, PS	1.89	Clinker production	15 119	0.52	0.43	0.75	0.14	0.099
Japan	CS, T2	CS	2.09	Production of clinker	49 293	0.51	0.45	0.43	0.02	0.000
Kazakhstan	T1, T2	CS, D	1.07		7 222	0.53	0.19	0.77	0.01	0.10
Latvia	T1, T2, T3	D, PS	5.04	(produced clinker)	1 091	0.51		NA, NO	0.01	C
Liechtenstein	NA	NA		Production	NO	NO		NO		NO
Lithuania	T1, T2	CS, D, PS	2.84	Clinker production	1 074	0.54	0.01	0.78	0.04	0.15
Luxembourg	CS, T2	CS, PS	3.67	clinker production	802	0.49		NO	0.60	0.16
Malta	T1	D		not occurring	NO	NO		NO		NO
Monaco	NA	NA		NO	NO	NO		NO		NO
Netherlands	CS, T1, T2, T3	D, PS	0.00	clinker production	13	0.50	0.10	0.44	0.04	0.045
New Zealand	CS, T1	CS, D	0.50	Clinker produced	C	C	0.13	0.78		NA
Norway	T1, T3	CS, D, PS	1.43	Production quantity	1 407	0.51	0.40	0.76	0.02	0.47
Poland	T1, T2	CS, D	1.97	Clinker production	14 178	0.54	0.36	0.74	0.14	0.16
Portugal	T1, T3	OTH	3.50		4 272	0.52	0.63	0.78	0.25	0.089
Romania	CS, OTH, T2, T3	CS, D, PS	3.42	clinker production	7 299	0.52	0.68	0.74	0.04	0.12
Russian Federation	T1, T2	CS, D	0.96	Clinker production	38 448	0.53	0.42	0.77	0.09	0.15
Slovakia	T2, T3	PS	3.51	Cement clinker	2 855	0.49	1.22	0.77	0.05	0.42
Slovenia	T2, T3	CS, D	2.80	Clinker produced	928	0.51	0.33	0.74	0.08	0.14
Spain	T1, T2, T3	CS, D, PS	2.88	Clinker production	17 511	0.52	0.47	0.69	0.16	0.10
Sweden	T3	CS, D, PS	2.65	Production of clinker	2 539	0.53	0.73	0.75	0.03	NE
Switzerland	CR, T2, T3	CS, D, OTH, PS	3.75	clinker production	3 227	0.54	0.10	C	0.02	0.045
Turkey	T1, T2	CS, D	6.01	Clinker Production	57 800	0.53	0.55	0.56	0.14	0.17
Ukraine	T1, T2, T3	CS, D	1.23	clinker production	7 482	0.55	0.67	0.77	0.08	0.19
United Kingdom of Great Britain and Northern Ireland (KP)	T3	CS	0.98	Clinker production	7 830	0.57	0.23	0.45	0.08	0.17
United Kingdom of Great Britain and Northern Ireland (Convention)	T3	CS	0.98	Clinker production	7 830	0.57	0.23	0.45	0.08	0.17
United States of America	T1, T2, T3	D	0.62	Clinker Production	78 600	0.52	0.18	0.75	0.02	0.42

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b The CRF requests Parties to specify the activity data used (e.g. cement or clinker) for estimating the emissions from cement production. The descriptions included in this column are as reported in the CRF by Parties.

^c Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 3 Chapter 2 Mineral Industry Emissions. Lime production table 2.4; glass production section 2.4.1.2.

Table 2.2

Chemical industry - CO₂ and N₂O (2019)

	CO ₂					N ₂ O						
	Methods and EF used		Ammonia production			Methods and EF used		Nitric acid production			Adipic acid production	
	Methods	EF	Share of national total ^a	Activity data (production)	CO ₂ IEF	Methods	EF	Share of national total ^a	Activity data (production)	N ₂ O IEF	Share of national total ^a	N ₂ O IEF
			(%)	(kt)	(t/t)			(%)	(kt)	(t/t)	(%)	(t/t)
IPCC default EF ^b					1.666 to 3.273					0.002 to 0.009		0.3
Australia	T2, T3	CS, D	0.36	1 576	1.4	T3	CS	0.41	1 699	0.004		NO
Austria	T1, T2, T3	D, PS	0.64	553	1.2	T3	PS	0.10	575	0.000		NO
Belarus	T1, T2	CS, D	1.63	1 101	2.1	T1, T2	D	0.59	356	0.005		NO
Belgium	T3	D, PS	0.75	687	1.4	T3	PS	0.20	2 085	0.000		NO
Bulgaria	T2	CS, PS	1.07	C	C	T3	PS	1.39	C	C		NO
Canada	T1, T2	CS, D, OTH, PS	0.35	4 278	1.3	T2, T3	CS, PS	0.04	968	0.001		NO
Croatia	T3	PS	2.52	481	2.0	T3	PS	0.21	302	0.001		NO
Cyprus				NO	NO				NO	NO		NO
Czechia	T1	CS, D, PS	0.47	178	3.3	CS, T3	CS, PS	0.07	596	0.001		NO
Denmark (KP)	T2	PS		NO	NO				NO	NO		NO
Denmark (Convention)	T2	PS		NO	NO				NO	NO		NO
Estonia				NO	NO				NO	NO		NO
European Union (KP)			0.53	15 552	1.7			0.09	NE	NE	0.01	NE
European Union (Convention)			0.54	15 552	1.7			0.09	NE	NE	0.01	NE
Finland	CS, T2, T3	CS, PS		NO	NO	T3	PS	0.39	655	0.001		NO
France (KP)	T1, T2, T3	CS, D, PS	0.34	1 075	1.4	T2, T3	CS, D, PS	0.12	1 860	0.001	0.00	C
France (Convention)	T1, T2, T3	CS, D, PS	0.33	1 075	1.4	T2, T3	CS, D, PS	0.12	1 860	0.001	0.00	C
Germany	T1, T2, T3	CS, D, PS	0.50	2 948	1.8	T3	PS	0.05	2 669	0.000	0.02	C
Greece	T1, T1a	CS	0.26	135	1.7	CS	CS	0.02	180	0.000		NO
Hungary	T3	PS	1.68	20 688	0.06	T3	PS	0.05	746	0.000		NO
Iceland				NO	NO				NO	NO		NO
Ireland				NO	NO				NO	NO		NO
Italy	D, T2, T3	CR, PS	0.13	465	1.9	T3	D, PS	0.01	421	0.000	0.02	0.003
Japan	CS, T1, T2, T3	CS, D	0.14	862	2.0	CS, T1, T2	CS, PS	0.03	311	0.003	0.01	C
Kazakhstan	T1, T2	CS, D	0.13	217	2.1	T1	D	0.05	284	0.002		NO
Latvia				NO	NO				NO	NO		NO
Liechtenstein				NO	NO				NO	NO		NO
Lithuania	T3	CS	9.76	1 051	2.1	T3	PS	0.88	1 158	0.001		NO
Luxembourg				NO	NO				NO	NO		NO
Malta	T1	D		NO	NO				NO	NO		NO
Monaco				NO	NO				NO	NO		NO
Netherlands	CS, T1, T3	CS, D	1.30	C	C	T1, T2	CS, PS	0.16	C	C		NO
New Zealand	T1, T2	CS, D	0.03	130	1.5				NO	NO		NO
Norway	T2	CS, D, PS	1.19	405	2.0	CS, T2, T3	PS	0.37	1 916	0.000		NO
Poland	T1, T2	CS, D	0.86	2 452	1.7	T1, T2	CS	0.12	2 331	0.001		NA, NO
Portugal	NO	NO		NO	NO	T3	PS	0.06	C	C		NO
Romania	D, T1, T3	D, PS	0.82	471	2.3	T3	PS	0.11	C	C		NO
Russian Federation	T1, T2, T3	CS, D	1.66	19 224	2.2	T1	D	0.26	9 405	0.002		
Slovakia	T2, T3	CS, PS	1.72	492	1.7	T3	D, PS	0.23	571	0.001		NO
Slovenia	T2, T3	CS, D		NO	NO				NO	NO		NO
Spain	T1, T3	D, PS	0.11	534	1.2	T1, T3	D, PS	0.05	696	0.001		NO
Sweden	T1, T3	D, PS		NO	NO	T2, T3	CS, PS	0.05	271	0.000		NO
Switzerland	T2	PS		C	C	T2	PS		NO	NO		NO
Turkey	T1, T2	CS, D	0.11	C		T1	D	0.24	908	0.004		NO
Ukraine	T1, T3	CS, D	0.78	1 829	2.1	T2, T3	CS, D	0.62	1 545	0.005		NO
United Kingdom of Great Britain and Northern Ireland (KP)	CS, T1, T3	CS, D	0.34	960	1.6	T1, T3	CS, D	0.01	1 185	0.000		NO
United Kingdom of Great Britain and Northern Ireland (Convention)	CS, T1, T3	CS, D	0.34	960	1.6	T1, T3	CS, D	0.01	1 185	0.000		NO
United States of America	CS, T1	CS, D, OTH	0.19	16 410	1.3	CS, T1	CS, D	0.15	8 080	0.004	0.08	C

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 3 Chapter 3 Chemical Industry Emissions. Ammonia table 3.1; nitric acid table 3.3; adipic acid table 3.4.

Table 2.3

Metal industry - CO₂ (2019)

	Methods and EF used		Iron and steel ^a				Aluminium production			
			Share of national total ^b	Steel		Pig iron				
	Methods	EF		Activity Data (production)	CO ₂ IEF	Activity Data (production)	CO ₂ IEF			
								(%)	(kt)	t/t
IPCC default EF ^c					1.46 (BOF) 0.08 (EAF) 1.72 (OHF)		1.35			1.6 (Prebake) 1.7 (Soderberg)
Australia	T2, T3	CS		C	NA, NO	NO	NO	0.42	1 576	1.5
Austria	T1, T3	CS, D, PS	12.86	6 882	1.5	5 741	IE, NO	0.01	C	C
Belarus	T1	D	0.24	2 718	0.080	NO	NO		NO	NO
Belgium	CS, T3	PS	3.36	7 698	0.50	4 934	IE, NA		NO	NO
Bulgaria	T2	CS, PS	0.06	580	0.055	NO	NO		C	NO
Canada	T2, T3	CS, PS	1.13	12 961	0.081	7 813	0.92	0.65	2 467	1.9
Croatia	OTH, T3	PS	0.02	69	0.066	NO	NO		NO	NO
Cyprus				NO	NO	NO	NO		NO	NO
Czechia	CS, T1, T2	CS, D, PS	5.02	4 603	IE, NA	3 648	IE, NA		NO	NO
Denmark (KP)	T1	D		NO	NO	NO	NO		NO	NO
Denmark (Convention)	T1	D		NO	NO	NO	NO		NO	NO
Estonia	T3	PS		NO	NO	NO	NO		NO	NO
European Union (KP)			1.74	NE	NE	NE	NE	0.11	NE	NE
European Union (Convention)			1.74	NE	NE	NE	NE	0.07	NE	NE
Finland	CS, T2, T3	CS	3.47	3 444	0.54	NO	IE, NO		NO	NO
France (KP)	T1, T2, T3	CS, D, PS	2.66	14 527	0.79	IE	IE	0.15	C	C
France (Convention)	T1, T2, T3	CS, D, PS	2.62	14 527	0.79	IE	IE	0.15	C	C
Germany	T1, T2, T3	CS, D	2.23	39 627	0.46	25 996	IE, NO	0.09	508	1.4
Greece	CS, T1	CS, D, PS	0.10	1 350	0.060	NO	NO	0.34	182 696	0.002
Hungary	T3	PS	1.89	1 769	0.097	1 151	1.6		NO	NO
Iceland	T3	PS		NO	NA, NO	NO	NO	27.02	838	1.5
Ireland				NO	NO	NO	NO		NO	NO
Italy	T2	CR, CS, PS	0.32	23 191	0.041	4 619	0.086		NO	NO
Japan	T2	OTH	0.46	38	3.7	12 120	0.44		NO	NA, NO
Kazakhstan	T1, T2	CS, D	2.00	4 131	0.12	3 165	1.6	0.38	263	5.1
Latvia				NO	NO	NO	NO		NO	NO
Liechtenstein						NO	NO		NO	NO
Lithuania	T2	D	0.01	NO	NO	NO	NO		NO	NO
Luxembourg	CS, T1, T2	CS, PS	0.97	2 104	0.049	NO	NO		NO	NO
Malta				NO	NO	NO	NO		NO	NO
Monaco				NO	NO	NO	NO		NO	NO
Netherlands	T1a, T2	CS, D	0.01	6 857	0.003	NA	IE, NO	0.00	88	0.000
New Zealand	T2, T3	CS	2.02	C	C	NA	NA, NO	0.70	351	1.6
Norway	T2, T3	CS, PS	0.06	619	0.045	NO	NO	4.01	1 308	1.5
Poland	T1, T2, T3	CS, D	0.49	IE	IE	4 242	0.15		NO	NA, NO
Portugal	T1, T3	D, PS	0.13	2 033	0.040	NO	NO		NO	NO
Romania	D, T3	CS, D, PS	3.44	3 617	1.1	C	IE, NO	0.29	200	1.6
Russian Federation	T1, T2, T3	CS, D, PS	4.37	73 883	0.11	51 184	1.4	0.30	C	
Slovakia	T1, T2, T3	D, PS	8.89	3 609	0.98	NO	IE, NO	0.69	175	1.6
Slovenia	T1, T2	D, PS	0.34	639	0.092	NO	NA, NO	0.65	68	1.6
Spain	T1, T2, T3	CS, D, PS	0.44	13 642	0.047	C	C	0.12	C	C
Sweden	T2, T3	PS	5.83	1 846	C, NA	3 172	0.80	0.35	117	1.5
Switzerland	CR, T2, T3	CS, D, PS	0.02	1 130	0.009	NO	NO		NO	NO
Turkey	T1, T2, T3	CS, D	2.09	33 887	0.25	3 874	IE, NO	0.02	78	1.4
Ukraine	T1, T3	CS, D	11.67	20 848	0.13	20 056	1.6		NO	NO
United Kingdom of Great Britain and Northern Ireland (KP)	T1, T2	CS	0.48	7 286	0.013	5 622	0.14	0.01	39	1.5
United Kingdom of Great Britain and Northern Ireland (Convention)	T1, T2	CS	0.48	7 286	0.013	5 622	0.14	0.01	39	1.5
United States of America	T1, T2	CS, D, OTH	0.63	61 172	0.094	22 302	0.34	0.03	1 126	1.7

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b In addition to data reported here, CO₂ emission estimates from direct reduced iron (2.C.1.e) were reported by European Union (Convention), European Union (KP), Russian Federation, Sweden and United States of America; CO₂ emission estimates from sinter (2.C.1.d) were reported by Belgium, European Union (Convention), European Union (KP), Hungary, Kazakhstan, Luxembourg, Poland, Portugal, Russian Federation, Spain, Sweden, Turkey, United Kingdom, United Kingdom (KP) and United States of America; CO₂ emission estimates from pellet (2.C.1.e) were reported by European Union (Convention), European Union (KP), Kazakhstan, Russian Federation, Sweden, Turkey and United States of America; CO₂ emission estimates from other (2.C.1.f) were reported by Austria, Belgium, Canada, Czechia, European Union (Convention), European Union (KP), Lithuania, Netherlands, Poland, Slovakia, Spain, Ukraine and United States of America.

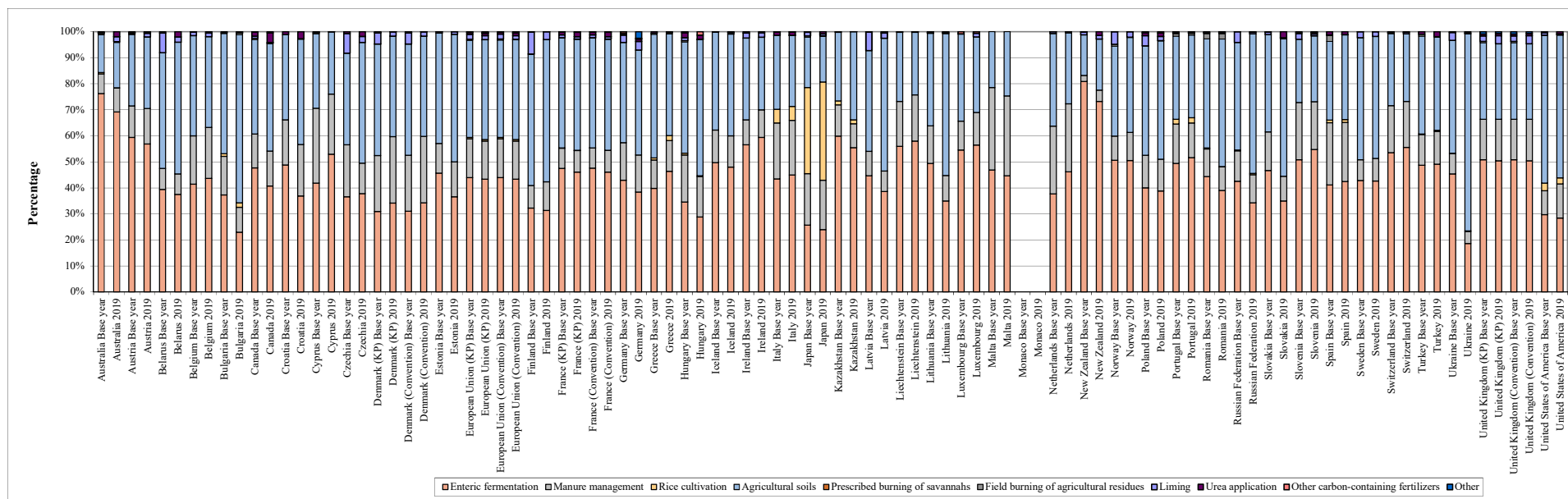
^c Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 3 Chapter 4 Metal Industry Emissions. Iron and steel table 4.1; Aluminium table 4.10.

Table 2.4
HFCs, PFCs, SF₆ and NF₃ (2019)

	Metal industry						Electronic industry						Product uses as substitutes for ODS						Other product manufacture and use			
	HFCs		PFCs		SF ₆		PFCs		SF ₆		NF ₃		HFCs		PFCs		HFCs		PFCs			
	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF
IPCC default EF																						
Australia			T2, T3	CS									M	CS, D								
Austria					T2	D	T3	PS	T3	PS	T3	PS	T2	D								
Belarus																						
Belgium							T2, T3	D, PS	T2, T3	D, PS	T2, T3	D, PS	T2	CS, D, PS	T2	CS, D, PS					NO	NO
Bulgaria									NO	NO	NO	NO	T2	D		NO	NO	NO	NO	NO	NO	NO
Canada			T1, T2, T3	CS, D, OTH	T3	D	T2	D, PS	T2	D, PS	T2	D, PS	T2	CS, D	T2	D					T2	D
Croatia													T2	D								
Cyprus													CS, T2	CS, D								
Czechia							T2	D	T2	D	T2	D	D, T1, T2	CS, D	D, T2	CS, D						
Denmark (KP)							T2	D					T2	D	T2	D						
Denmark (Convention)							T2	D					T1, T2	D	T2	D						
Estonia													T2	CS								
European Union (KP)																						
European Union (Convention)																						
Finland													T2	CS, D	T2	D						
France (KP)			T2, T3	CS, PS			T2	CS	T2	CS	T2	CS	T1, T2	CS, D, PS			T2	OTH	T2	CS, D		
France (Convention)			T2, T3	CS, PS			T2	CS	T2	CS	T2	CS	T1, T2	CS, D, PS			T2	OTH	T2	CS, D		
Germany	D	D	T3	CS	D	D	CS	PS	CS	PS	CS	PS	CS, T2	CS, D	T2	CS, D						
Greece			T3	PS									CS, T2	D	T2	D						
Hungary													T1, T2	CS, D	T2	D					NO	NO
Iceland			T2	D									T2, T3	D	T2	D						
Ireland							T2	CS	T2	CS	T2	CS	T1, T2, T3	CS								
Italy	T2	PS					T2	CS	T2	CS	T2	CS	T2	CS, D								
Japan		CS			T2	OTH	T2	CS, D	T2	CS, D	T2	CS, D	CS	CS, D	CS	CS						
Kazakhstan			T1	D																		
Latvia													T1a, T2	CS, D, OTH								
Liechtenstein							CS	CS	CS	CS	CS	CS	CS	CS	CS	CS						
Lithuania									T3	PS			T1a, T1b, T2	CS, D, PS								
Luxembourg													T1, T2	CS, M, PS					T3	PS		
Malta													CS, T1, T2	CS, D							CS	CS
Monaco													CS, T2	CS, D, OTH								
Netherlands													T2	CS								
New Zealand			T2	D									T1a, T2	CS, D	CS, T2	CS					T1	D
Norway									T2	CS					T1, T2	CS, D						
Poland									NO	NO	NO	NO	T1a, T1b, T2	D	T2	D					NO	
Portugal	NO	NO	NO	NO	NO	NO							T2	D	T2	D						
Romania			T2	D, PS									T2	CS, D	T2	D						
Russian Federation			T2	D, PS			T2	D	T2	D	T2	D	T1, T2	CS, D	T1	D						
Slovakia			T2	PS									T1a, T2	CS, D								
Slovenia			T3	D, PS									T1, T2	CS, D	NO	NO						
Spain			T2	D									T1a, T2	CS, D	T2	CS						
Sweden	T2	D	T2	D									T1, T2	CS, D, PS	T2	CS						
Switzerland							T2	D	T2	D	T2	D	T1a, T2	CS, D	T2	CS			T1a, T3	D, PS	T1a, T3	D, PS
Turkey																						
Ukraine													T1a, T2	CS, D								
United Kingdom of Great Britain and Northern Ireland (KP)	T2	PS	T2	PS	T2	PS					T2	D	CS, T1a, T2	CS, OTH							T2, T3	CS, D
United Kingdom of Great Britain and Northern Ireland (Convention)	T2	PS	T2	PS	T2	PS					T2	D	CS, T1a, T2	CS, OTH							T2, T3	CS, D
United States of America	M, T3	CS, M			M, T3	CS, M	M, T2	CS, M	M, T2	CS, M	M, T2	CS, M	M, T2	CS, M	M, T2	CS, M						

Figure 3.1

Contribution of subsectors to total GHG emissions in the Agriculture sector^{a, b}



^a In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

^b Indirect CO₂ emissions are excluded from the totals in this graph.

Table 3.1

Enteric fermentation - CH₄ (2019)

	Share of national total ^a	Methods and EF used		Activity data (population size)			Cattle						Sheep			Swine				
							Option A		Option B		Option C	Activity data (population size)			CH ₄ IEF	Activity data (population size)		CH ₄ IEF		
		Dairy cattle	Non-dairy cattle	Mature dairy cattle	Other mature cattle	Growing cattle	Other	CRF	FAO ^b	Difference	CRF	FAO ^b	Difference	CRF	FAO ^b	Difference				
																	CH ₄ IEF	CH ₄ IEF	CH ₄ IEF	
(%)	Methods	EF	CRF	FAO ^b	Difference	(kg/head/yr)						(thousands of head)	(%)	(kg/head/yr)	(thousands of head)	(%)	(kg/head/yr)			
IPCC default EF ^{c,d}						46-128	27-60						5-8				1.0-1.5			
Australia	8.84	CS, T1, T2	CS, D	26 106	24 723	-5.30						56	69 003	65 755	-4.71	6.8	2 346	2 319	-1.14	1.6
Austria	5.09	T1, T2	CS, D	1 880	1 880	0.00	137	59					403	403	0.00	8.0	2 773	2 773	0.00	1.5
Belarus	9.02	T1, T2	CS, D	4 330	4 295	-0.81	116	51					88	87	-0.23	8.0	2 841	2 882	1.45	1.5
Belgium	3.50	T1, T2	CS, D	2 387	2 373	-0.59	127	47					138		–	8.0	6 224	6 085	-2.23	1.5
Bulgaria	2.56	T1, T2	CS, D	518	527	1.68			108	77	53		1 316	1 281	-2.62	7.4	573	492	-14.20	1.5
Canada	3.29	T1, T2	CS, D	11 900	11 500	-3.36	142	71					935	828	-11.42	8.0	13 978	14 399	3.02	1.5
Croatia	4.21	T1, T2	CS, D	420	420	-0.06			112	63	60		657	658	0.12	8.0	1 055	1 022	-3.11	1.5
Cyprus	3.06	T1, T2	CS, D	74	74	0.13	121	57					324			8.0	346	352	1.80	1.5
Czechia	2.51	T1, T2	CS, D	1 418	1 367	-3.57	156	59					213	213	0.00	8.0	1 544	1 509	-2.28	1.5
Denmark (KP)	8.41	T1, T2	CS, D, OTH	1 491			162	41					220			6.7	12 299			1.1
Denmark (Convention)	8.13	T1, T2	CS, D, OTH	1 493	1 500	0.45	162	41					316	147	-53.53	7.3	12 299	12 728	3.49	1.1
Estonia	3.72	D, T1, T2	CS, D, OTH	254	254	0.04			156	60	38		81	71	-12.62	8.0	302	302	0.00	1.0
European Union (KP)	4.56			91 073			130	49					99 714			7.1	142 871			1.2
European Union (Convention)	4.57			90 992	86 878	-4.52	130	49					99 081	96 878	-2.22	7.1	142 833	148 237	3.78	1.2
Finland	3.90	CS, OTH, T1, T2	CS, D, OTH	858	841	-1.97	159	56					145	145	0.00	8.4	1 062	1 062	0.00	1.0
France (KP)	7.72	T2, T3	CS	18 175			124	53					6 957			13	13 168			0.74
France (Convention)	7.63	T1, T2, T3	CS, D	18 258	18 151	-0.59	124	53					6 962	7 105	2.06	13	13 233	13 510	2.09	0.74
Germany	2.93	T1, T2, T3	CS, D	11 640	11 640	0.00	139	46					1 814	1 557	-14.17	6.4	21 596	26 053	20.64	1.2
Greece	4.26	T1, T2	CS, D	547	530	-3.15	127	63					8 797	8 427	-4.20	9.5	727	733	0.84	1.5
Hungary	3.18	T1, T2	CS, D	904	909	0.57	125	54					1 100	1 061	-3.57	8.0	2 796	2 634	-5.81	1.5
Iceland	6.28	T1, T2	CS, D	81	81	-0.03			110	74	36		633	416	-34.28	8.7	38	28	-26.92	1.5
Ireland	20.33	CS, T1, T2	CS, D	7 110	6 560	-7.74	122	49					5 066	5 146	1.57	5.6	1 613	1 613	-0.09	1.3
Italy	3.17	T1, T2	CS, D	5 975	6 377	6.73	130	48					7 001	7 001	0.00	7.2	8 510	8 510	0.00	1.5
Japan	0.62	CS, T1	CS, D	3 907	3 835	-1.85	100	60					21	16	-26.40	8.0	9 157	9 156	-0.01	1.4
Kazakhstan	5.79	T1, T2	CS, D	8 217	7 436	-9.50	102	52					19 484	16 913	-13.19	6.6	1 017	813	-20.00	1.0
Latvia	7.63	T1, T2	CS, D, OTH	395	395	-0.02			146	82	29		100	100	0.02	8.0	314	314	0.00	1.5
Liechtenstein	7.59	T2	CS	6.1	6.1	0.00			140	107	43		3.9	3.9	-0.70	8.8	1.7	3.9	123.72	1.1
Lithuania	7.28	T1, T2	CS, D, OTH	657	635	-3.48	131	58					173	152	-12.00	10	561	551	-1.89	1.3
Luxembourg	3.74	T1, T2	CS, D	194	192	-0.76						82	7.3	8.7	19.72	7.8	76	84	10.02	1.5
Malta	1.56	T1, T2	CS, D	14	14	-0.43							13	13	-0.16	9.8	35	35	0.01	1.5
Monaco	–	NA	NA	NO		–	NO	NO					NO		–	NO	NO		–	NO
Netherlands	4.50	T1, T2, T3	CS, D	3 750	3 721	-0.77			135	77	33		990	758	-23.45	8.0	12 214	11 921	-2.40	1.5
New Zealand	35.20	T1, T2	CS, D	10 151	10 151	0.00	90	61					26 822	26 822	0.00	13	256	256	0.00	1.1
Norway	4.45	T1, T2	CS, D	820	873	6.52			149	86	57		1 306	2 300	76.17	12	789	793	0.45	1.5
Poland	3.25	T1, T2	CS, D	6 297	6 262	-0.56						77	273	273	0.00	8.0	10 781	11 216	4.03	1.5
Portugal	5.57	T1, T2	CS, D	1 678	1 675	-0.20	133	58					2 217	2 132	-3.86	9.4	2 207	2 216	0.41	1.1
Romania	6.56	T1, T2	CS, D	1 904	1 923	1.00	124	64					10 359	10 359	0.00	8	3 834	3 834	0.00	1.5
Russian Federation	1.84	CS, T1, T2	CS, D	18 538	18 151	-2.09	85	57					22 658	21 136	-6.72	8.0	24 343	23 727	-2.53	1.2
Slovakia	2.42	T1, T2	CS, D	432	432	0.00	123	61					321	321	0.00	10.7	589	589	0.00	1.5
Slovenia	5.51	T1, T2	CS, D	483	483	0.00						75	82	110	34.72	8.0	240	240	0.00	1.5
Spain	5.09	CS, T2, T3	CS, D	6 661	6 600	-0.91	125	62					15 479	15 479	0.00	7.6	30 855	31 246	1.27	0.80
Sweden	5.81	CS, T1	CS, D	1 466	1 405	-4.20	143	50					549	379	-30.87	8.0	1 456	1 481	1.73	1.5
Switzerland	7.03	T2, T3	CS, M	1 525	1 525	0.00			137	107	38		400	344	-14.04	9.1	1 448	1 360	-6.09	1.0
Turkey	6.59	T1, T2	CS, D	17 688	17 043	-3.65	83	47					37 276	35 195	-5.58	5.1	1.4	1.6	13.93	1.0
Ukraine	2.37	T1, T2	CS, D	3 410	3 333	-2.27			111	69	45		887	699	-21.26	8.6	6 130	6 025	-1.71	1.5
United Kingdom of Great Britain and Northern Ireland (KP)	4.69	T1, T3	CS, D	9 574		–	125	55					34 289		–	4.8	5 078		–	1.5
United Kingdom of Great Britain and Northern Ireland (Convention)	4.68	T1, T3	CS, D	9 574	9 739	1.73	125	55					34 289	33 580	-2.07	4.8	5 078	5 130	1.02	1.5
United States of America	2.72	M, T1, T2	CS, D, M	102 675	94 805	-7.67						67	5 230	5 230	0.00	9.0	76 907	78 658	2.28	1.5

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.

^b Source of international statistics: FAOSTAT data, downloaded on 20 May 2021 from <http://www.fao.org/faostat/en/#data/QA>.

^c Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10: Emissions from Livestock and Manure Management. Dairy and Other cattle table 10.11; Sheep and Swine table 10.10.

^d For dairy and other cattle, 2006 IPCC default emission factors (in kg CH₄/head/year) are provided by regions as shown below (see footnote c for source reference).

	Western Europe	Eastern Europe	Oceania	Latin America	Asia	Africa and Middle East	Indian Subcontinent
Dairy cattle	117	99	90	72	68	46	58
Other cattle	57	58	60	56	47	31	27

Table 3.2

Manure management - CH₄ (2019)

	Share of national total ^a	Methods and EF used		Cattle						Sheep	Swine
				Option A		Option B			Option C		
		Dairy cattle	Non-dairy cattle	Mature dairy cattle	Other mature cattle	Growing cattle	Other				
	(%)	Methods	EF	CH ₄ IEF (kg/head/yr)							
IPCC default EF ^b				1-112	0 to 26					0.10 to 0.37	0 to 45
Australia	1.06	CS, T2, T3	CS, D						5.7	0.34	23
Austria	0.67	T1, T2	CS, D	17	6.2					0.31	1.1
Belarus	0.73	T1, T2	CS, D	5.9	2.3					0.19	3.1
Belgium	1.01	T1, T2	CS, D	26	2.8					0.19	4.5
Bulgaria	0.54	T1, T2	CS, D			22	15	11		0.22	4.4
Canada	0.53	T1, T2	CS, D	39	3.7					0.28	4.8
Croatia	1.64	T2	CS, D			38	10	10		0.22	6.5
Cyprus	0.56	T1, T2	D	10	4.4					0.28	3.5
Czechia	0.42	T1, T2	CS, D	13	3.6					0.19	6.3
Denmark (KP)	4.79	CS, T2	CS, D	48	15					0.20	3.4
Denmark (Convention)	4.60	CS, T1, T2	CS, D	48	15					0.20	3.4
Estonia	0.92	D, T1, T2	CS, D			34	6.2	5.0		0.19	5.1
European Union (KP)	1.00			21	5.0					0.30	4.9
European Union (Convention)	1.00			21	5.0					0.30	4.9
Finland	0.85	T2	CS	30	6.5					0.25	3.4
France (KP)	0.85	T2	CS	11	3.2					0.32	4.1
France (Convention)	0.85	T2	CS	11	3.2					0.32	4.2
Germany	0.72	T2	CS, D	21	6.9					0.28	4.2
Greece	0.75	T1, T2	CS, D	14	3.7					1.0	16
Hungary	1.01	T1, T2	CS, D	30	10					0.29	3.7
Iceland	1.18	T1, T2	CS, D			31	3.0	9.4		0.73	6.0
Ireland	2.63	T1, T2	CS, D	11	5.1					0.49	6.6
Italy	0.99	T1, T2	CS, D	23	10					0.21	8.2
Japan	0.19	CS, T1	CS, D	60	1.7					0.28	0.54
Kazakhstan	0.23	T1, T2	CS, D	4.6	0.98					0.10	4.0
Latvia	0.85	T1, T2	CS, D			18	2.0	1.1		0.19	2.3
Liechtenstein	1.49	T2	D			29	19	5.8		1.2	4.6
Lithuania	1.14	T1, T2	CS, D	13	7.1					0.41	3.6
Luxembourg	0.58	T1, T2	CS, D						11	0.15	5.0
Malta	0.51	T1, T2	CS, D						8.2	11	0.50
Monaco	–	NA	NA	NO	NO					NO	NO
Netherlands	2.12	T1, T2	CS, D			39	6.8	7.9		0.19	5.7
New Zealand	1.97	T1, T2	CS, D	8.8	0.84					0.14	5.9
Norway	0.65	T1, T2	CS, D			24	14.3	4.8		0.59	2.7
Poland	0.30	T1, T2	CS, D						4.1	0.19	1.4
Portugal	1.14	T2	CS, D	26	1.9					0.35	7.6
Romania	0.57	T1, T2	CS, D	6.8	2.5					0.23	2.8
Russian Federation	0.26	CS, T1, T2	CS, D	3.5	2.9					0.19	5.7
Slovakia	0.25	T1, T2	CS, D	8.3	2.1					0.39	3.0
Slovenia	1.38	T1, T2	CS, D						16	0.24	3.7
Spain	2.21	T1, T2, T3	CS, D	36	4.1					0.28	6.9
Sweden	0.53	T1, T2	CS, D	9.2	3.8					0.19	1.4
Switzerland	1.38	T2, T3	CS, M			23	13	5.1		1.2	4.0
Turkey	0.75	T1	D	20	1.0					0.13	3.8
Ukraine	0.30	CS, T1, T2	CS, D			4.0	2.7	1.3		0.24	2.8
United Kingdom of Great Britain and Northern Ireland (KP)	0.88	T1, T2, T3	CS, D	41	7.0					0.13	4.1
United Kingdom of Great Britain and Northern Ireland (Convention)	0.88	T1, T2, T3	CS, D	41	7.0					0.13	4.1
United States of America	0.95	M, T1, T2	CS, D, M						14	0.54	12

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland

^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 Emissions from Livestock and Manure Management. Dairy, Other cattle and Swine table 10.14; Sheep table 10.15. Default emission factors are provided according to climate regions (cool, temperate, warm), as shown below.

Default IPCC emission factors according to climate regions^b

	Dairy cattle			Other cattle			Swine		
	cool	temperate	warm	cool	temperate	warm	cool	temperate	warm
North America	48-58	63-98	105-112	1	2	2	10-23	13-39	22-45
Western Europe	21-29	34-75	83-92	6-8	10-21	24-26	6-12	9-27	19-33
Eastern Europe	11-15	20-37	42-46	6-8	9-19	21-23	3-5	4-12	10-17
Oceania	23-26	27-30	31	1	2	2	11-22	13-24	13-24
Latin America	1	1	2	1	1	1	1	1	2
Africa	1	1	1	0	1	1	0-1	1	1-2
Middle East	2	2	2-3	1	1	1	1-2	2-5	5-6
Asia	9-12	13-26	28-31	1	1	1	2	3-6	6-7
Indian Subcontinent	5	5	5-6	2	2	2	2-3	3-5	6
	Sheep								
	cool	temperate	warm						
Developed countries	0.19	0.28	0.37						
Developing countries	0.10	0.15	0.20						

Table 3.3

Manure management - N₂O (2019)

	N excretion rates						Share of national total ^a	Methods and EF used		N ₂ O IEF				
	Option A		Option B			Option C				Dairy cattle	Non-dairy cattle	Sheep	Swine	Other livestock
	Dairy cattle	Non-dairy cattle	Mature dairy cattle	Other mature cattle	Growing cattle	Other								
	(kg N / head / year)							(%)	Methods	EF				
IPCC default EF ^b	0.35 to 0.70	0.31 to 0.79												
Australia						46	0.12	CS, T2, T3	D			NA	0.080	0.004
Austria	107	45					0.55	T2	CS	0.67	0.38	0.067	0.046	0.004
Belarus	77	37					1.17	T1	D	0.50	0.23	0.073	0.076	0.005
Belgium	121	54					0.56	T2	D	0.71	0.55	0.019	0.030	0.001
Bulgaria			98	65	53		0.52	T1, T2	D			0.039	0.008	0.017
Canada	122	48					0.55	T1	D	0.92	0.70	0.045	0.015	0.016
Croatia			109	64	36		0.62	T2	CS, D			0.021	0.011	0.007
Cyprus	96	38					0.79	T1	D	0.72	0.29	0.098	0.036	0.015
Czechia	109	59					0.36	T2	CS, D	0.58	0.32	0.035	0.055	0.004
Denmark (KP)	156	43					1.49	T2	D	0.95	0.37	0.029	0.058	0.007
Denmark (Convention)	156	43					1.44	T1, T2	CS, D	0.94	0.37	0.045	0.058	0.007
Estonia			125	47	31		0.45	T1, T2	CS, D			0.085	0.006	0.005
European Union (KP)	116	52					0.54			0.54	0.27	0.017	0.053	0.004
European Union (Convention)	116	52					0.54			0.55	0.27	0.017	0.053	0.004
Finland	137	55					0.52	T2	D	0.80	0.43	0.059	0.034	0.007
France (KP)	116	60					0.54	T2	CS, D	0.40	0.18	0.022	0.004	0.001
France (Convention)	116	60					0.54	T2	CS, D	0.40	0.18	0.022	0.004	0.001
Germany	120	43					0.36	T2	CS, D	0.58	0.31	0.029	0.073	0.002
Greece	120	55					0.34	D	D	0.87	0.27	0.012	0.11	0.002
Hungary	125	52					0.72	T1, T2	CS, D	1.2	0.53	0.071	0.060	0.004
Iceland			98	60	30		0.39	T1, T2	CS, D			0.044	NO	0.004
Ireland	109	57					1.00	T2	CS, D	0.13	0.16	0.010	0.026	0.002
Italy	106	52					0.50	T2	CS, D	0.63	0.32	0.013	0.092	0.005
Japan	77	43					0.30	CS, T1	CS, D	1.5	0.87	IE	0.44	0.003
Kazakhstan	61	43					0.74	T1, T2	CS, D	0.67	0.47	0.043	0.57	0.028
Latvia			117	63	20		0.70	T1, T2	D			0.078	0.047	0.003
Liechtenstein			114	85	35		0.83					0.085	0.030	0.011
Lithuania	114	44					0.90	T1, T2	D	0.63	0.28	0.046	0.012	0.003
Luxembourg						75	0.25	T2	CS			0.017	0.037	0.010
Malta						74	0.56	T1, T2	CS, D			0.10	0.044	0.004
Monaco	NO	NO								NO	NO	NO	NO	NO
Netherlands			146	84	38		0.44	T1	D			0.007	0.027	0.003
New Zealand	119	80					0.14	T1	CS	NO	NO	NO	0.15	0.001
Norway			133	93	45		0.30	T2	CS, D			0.020	0.013	0.002
Poland						75	0.72	T1, T2	CS, D			0.044	0.085	0.001
Portugal	118	56					0.29	T2	CS, D	0.45	0.041	0.005	0.006	0.004
Romania	83	44					0.96	T2	D	0.33	0.18	0.061	0.10	0.003
Russian Federation	90	27					0.32	T1	CS, D	0.55	0.14	0.072	0.030	0.007
Slovakia	115	43					0.41	T1, T2	CS	0.78	0.26	0.093	0.073	0.002
Slovenia						57	0.47	T1, T2	CS, D			0.054	0.031	0.002
Spain	113	57					0.52	T1, T2	D	0.42	0.13	0.013	0.032	0.003
Sweden	134	43					0.65	CS, T2	CS, D	0.75	0.26	0.028	0.067	0.008
Switzerland			112	85	33		0.87	CS, T3	D			0.084	0.024	0.004
Turkey	82	37					0.94	T1	D	0.54	0.25	0.067	NO	0.004
Ukraine			70	56	29		0.30	CS, T1, T2	CS, D			0.018	0.090	0.002
United Kingdom of Great Britain and Northern Ireland (KP)	113	44					0.60	T2	CS, D	0.52	0.58	0.003	0.17	0.008
United Kingdom of Great Britain and Northern Ireland (Convention)	113	44					0.60	T2	CS, D	0.52	0.58	0.003	0.17	0.008
United States of America						58	0.30	M, T1, T2	CS, D, M			0.20	0.091	0.003

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland

^b Source of default N excretion rates: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 Emissions from Livestock and Manure Management, table 10.19, page 10.59. Default values are provided by regions as shown below. The unit of the IPCC defaults is kg N (1000 kg animal mass)⁻¹ day⁻¹.

IPCC defaults:

	North America	Western Europe	Eastern Europe	Oceania	Latin America	Africa	Middle East	Asia
Dairy cattle	0.44	0.48	0.35	0.44	0.48	0.6	0.7	0.47
Non-dairy cattle	0.31	0.33	0.35	0.5	0.36	0.63	0.79	0.34
Sheep	0.42	0.85	0.9	1.13	1.17	1.17	1.17	1.17
Swine	0.5	0.68	0.74	0.73	1.64	1.64	1.64	0.5
Poultry	0.83	0.83	0.82	0.82	0.82	0.82	0.82	0.82

Table 3.4
Agriculture soils - N₂O (2019)

	Methods and EF used		Share of national total ^a	Direct N ₂ O emissions from managed soils							Share of national total ^a	Indirect N ₂ O emissions from managed soils			
				Inorganic N fertilizers		Organic N fertilizers	Urine and dung deposited by grazing animals	Crop residue	Loss/gain of soil organic matter	Cultivation of organic soils		Atmospheric deposition		Nitrogen leaching and run-off	
	Activity data	N ₂ O IEF		Activity data	N ₂ O IEF							Activity data	N ₂ O IEF		
	Use of synthetic fertilizers													N ₂ O IEF	
Methods	EF	(%)	(kg N / year)	(kg N ₂ O-N / kg N)					(%)	(kg N / year)	(kg N ₂ O-N / kg N)	(kg N / year)	(kg N ₂ O-N / kg N)		
IPCC default EF				0.01 (0.003-0.03) ^b					8 (2-24) ^c , 16 (5-48) ^d			0.01 (0.002-0.05) ^c	0.0075 (0.0005-0.025) ^e		
Australia	CS, T1, T2	CS, D	1.69	1 337 593 241	0.004	0.009	0.004	0.010	0.002	14	0.55	504 061 660	0.003	455 602 223	0.011
Austria	T1	D	2.07	105 684 985	0.010	0.010	0.017	0.010	0.010	8.2	0.40	29 733 276	0.010	50 789 419	0.008
Belarus	T1	D	10.45	407 300 000	0.010	0.010	0.020	0.010	NE	8.0	1.76	78 953 860	0.010	347 466 782	0.008
Belgium	T1	D	2.21	145 494 730	0.010	0.010	0.019	0.010	0.010	8.0	0.59	35 102 051	0.010	149 624 514	0.008
Bulgaria	T1	D	5.67	352 486 000	0.010	0.010	0.012	0.010	0.010	8.0	1.55	35 059 333	0.010	200 260 474	0.008
Canada	T1, T2	CS, D	2.77	2 640 000 000	0.009	0.012	0.002	0.008	0.013	8.0	0.57	264 353 556	0.010	842 448 552	0.008
Croatia	T1	D	3.51	97 519 600	0.010	0.010	0.011	0.010	0.010	8.0	1.12	17 258 741	0.010	52 168 761	0.008
Cyprus	T1	CS, D	1.19	7 824 000	0.010	0.010	NO	0.010	NO	NO	0.19	3 596 601	0.010	NO	NO
Czechia	T1, T2	CS, D	2.37	332 032 000	0.010	0.010	0.019	0.010	0.010	NO	0.72	53 199 848	0.010	605 657 903	0.002
Denmark (KP)	CS, T1, T2	D	8.29	237 784 000	0.010	0.010	0.018	0.010	0.010	7.5	1.23	37 511 376	0.010	162 597 000	0.005
Denmark (Convention)	CS, T1, T2	CS, D	7.97	237 930 081	0.010	0.010	0.017	0.010	0.010	7.5	1.18	37 559 900	0.010	162 645 541	0.005
Estonia	D, T1	D	4.06	41 438 000	0.010	0.010	0.017	0.010	NO	8.0	0.93	8 007 131	0.010	28 350 036	0.008
European Union (KP)			3.32	11 009 458 989	0.010	0.010	0.014	0.010	0.007	6.7	0.72	1 982 181 106	0.010	6 159 750 353	0.007
European Union (Convention)			3.32	10 999 077 989	0.010	0.010	0.014	0.010	0.007	7.2	0.72	1 980 002 640	0.010	6 152 164 371	0.007
Finland	T1, T2	CS, D	6.06	146 798 000	0.010	0.010	0.017	0.010	0.010	9.8	0.76	9 705 913	0.010	97 665 872	0.008
France (KP)	T1, T2	CS, D	5.92	2 185 716 357	0.010	0.010	0.019	0.010	NO	8.0	1.25	300 032 200	0.010	1 156 596 286	0.008
France (Convention)	T1, T2	CS, D	5.84	2 189 899 491	0.010	0.010	0.019	0.010	NO	8.0	1.24	300 986 346	0.010	1 159 644 815	0.007
Germany	T1, T2	CS, D	2.48	1 419 466 500	0.010	0.010	0.019	0.010	0.010	6.2	0.61	290 070 911	0.010	1 011 412 281	0.008
Greece	T1	D	2.65	189 748 000	0.010	0.010	0.010	0.010	NE	8.0	0.95	67 397 288	0.010	140 898 046	0.008
Hungary	T1, T2	D	5.37	415 901 000	0.010	0.010	0.015	0.010	0.010	NO	0.43	37 457 008	0.010	28 391 071	0.008
Iceland	T1, T1b, T2	CS, D	4.35	10 381 000	0.010	0.010	0.011	0.010	NO	0.55	0.78	2 178 466	0.010	7 585 982	0.007
Ireland	T1	CS, D	8.62	367 364 000	0.012	0.010	0.009	0.010	0.010	4.3	0.96	53 704 970	0.010	91 367 080	0.008
Italy	CS, T1	CS, D	1.55	466 842 129	0.010	0.010	0.011	0.010	NA	8.0	0.37	122 842 182	0.010	278 787 841	0.008
Japan	CS, T2	CS, D	0.30	401 507 729	0.007	0.006	0.009	0.010	0.004	1.2	0.16	137 600 882	0.010	364 442 870	0.008
Kazakhstan	T1, T2	CS, D	3.13	54 542 290	0.009	0.010	0.015	0.010	0.010	NO	0.41	154 225 789	0.010	2 111 280 088	0.001
Latvia	T1	D	8.55	80 700 000	0.010	0.010	0.019	0.010	NO	3.7	1.55	12 894 645	0.010	31 909 310	0.008
Liechtenstein	T1b	D	2.39	184 279	0.010	0.010	0.018	0.010	NO	8.0	0.77	80 176	0.026	129 721	0.008
Lithuania	T1	D	9.39	177 000 000	0.010	0.010	0.019	0.010	NO	8.0	1.99	21 268 852	0.010	87 102 560	0.008
Luxembourg	T1, T2	CS, D	1.51	13 794 769	0.010	0.010	0.020	0.010	0.010	NO	0.42	2 921 116	0.010	8 876 468	0.008
Malta	T1	D	0.64	585 922	0.010	0.010	NO	0.010	0.010	NO	0.22	372 886	0.010	893 557	0.008
Monaco			–	NO	NO	NO	NO	NO	NO	NO	–	NO	NO	NO	NO
Netherlands	T1, T1b, T2	CS, D	2.35	226 049 388	0.011	0.008	0.031	0.014	NO	4.4	0.32	41 207 917	0.012	97 207 647	0.008
New Zealand	T1, T2	CS, D	7.68	452 000 000	0.007	0.004	0.005	0.010	0.010	8.0	1.75	197 597 250	0.010	145 476 364	0.008
Norway	T1	CS, D	2.77	106 765 341	0.010	0.010	0.016	0.010	NO	13	0.45	12 548 969	0.012	44 970 363	0.007
Poland	T1	CS, D	3.10	994 100 000	0.010	0.010	0.019	0.010	0.010	8.0	0.71	191 450 318	0.010	538 752 244	0.008
Portugal	T1, T2	CS, D	2.77	105 945 518	0.010	0.010	0.018	0.010	0	NO	0.66	23 277 594	0.010	87 932 072	0.008
Romania	T1	D	6.31	455 964 000	0.010	0.010	0.013	0.009	NO	8.0	1.95	133 330 008	0.010	442 160 135	0.008
Russian Federation	CS, T1, T2	CS, D	2.48	1 727 454 000	0.014	0.008	0.014	0.010	0.009	8.0	0.41	532 698 468	0.009	1 910 689 677	0.007
Slovakia	T1, T2	CS, D	2.92	128 532 971	0.010	0.010	0.016	0.010	0.010	NE	0.75	19 490 075	0.010	59 223 480	0.008
Slovenia	T1, T2	D	1.92	28 048 000	0.010	0.010	0.017	0.010	0.010	8.0	0.62	8 036 651	0.010	19 632 318	0.008
Spain	CS, T1, T2	D	3.30	1 010 579 000	0.010	0.010	0.017	0.010	NA	NO	0.61	280 375 382	0.010	168 022 225	0.008
Sweden	CS, T1, T2	CS, D	5.85	182 641 000	0.010	0.010	0.017	0.010	0.010	13	0.55	20 178 452	0.010	53 125 919	0.008
Switzerland	T1, T3	CS, D	2.45	40 156 499	0.010	0.010	0.019	0.010	0.010	8.0	0.85	21 334 753	0.026	37 262 105	0.008
Turkey	T1	D	4.27	1 682 548 512	0.010	0.010	0.013	0.010	NO	8.0	0.54	539 396 058	0.010	63 533 612	0.008
Ukraine	CS, T1, T2	D	7.76	1 274 863 123	0.010	0.010	0.019	0.010	0.010	8.0	1.93	236 039 087	0.010	1 507 569 104	0.008
United Kingdom of Great Britain and Northern Ireland (KP)	T1, T2	CS, D	2.19	1 083 038 120	0.007	0.006	0.004	0.010	0.010	9.5	0.52	124 519 915	0.010	502 759 851	0.008
United Kingdom of Great Britain and Northern Ireland (Convention)	T1, T2	CS, D	2.19	1 083 038 120	0.007	0.006	0.004	0.010	0.010	9.5	0.52	124 519 915	0.010	502 759 851	0.008
United States of America	OTH, T1	D, OTH	4.43	13 023 070 931	0.012	0.010	0.007	0.008	0.008	9.8	0.83	2 462 358 464	0.010	12 150 381 203	0.007

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland

^b Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 11.1, page 11.11. IEFs for N-fixing crops and crop residues are shown in the unit kg N₂O-N/kg N. The unit of the IPCC default emission factor is also kg N₂O-N/kg N.

^c For cultivation of histosols (drained/managed organic soils), the two default values refer to temperate. The values in parenthesis indicate the range as presented in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 11.1, page 11.11.

^d For cultivation of histosols (drained/managed organic soils), the two default values refer to temperate tropical. The values in parenthesis indicate the range as presented in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 11.1, page 11.11.

^e Source of default emission factor: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 11.3, page 11.24.

Table 4.1a
Methods and emission factors used (2019)

	Forest Land						Cropland						Grassland					
	CO ₂		CH ₄		N ₂ O		CO ₂		CH ₄		N ₂ O		CO ₂		CH ₄		N ₂ O	
	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF
Australia	T2, T3	CS, M	T2, T3	CS	T2, T3	CS	T1, T2, T3	CS, D, M	T2	CS	T2	CS	T1, T2, T3	CS, D, M	T2, T3	CS	T2, T3	CS
Austria	T2, T3	CS	T1	D	T1, T2	CS, D	T2, T3	CS			T2	CS, D	T1, T2, T3	CS	T1	D		
Belarus	T1, T2	CS, D	T1	CS, D	T1	CS, D	T1	D										
Belgium	CS, T1, T2	CS					CS, T1, T2	CS			T1	D	CS, T1, T2	CS			T1	D
Bulgaria	T1, T2	CS, D	T1	D	T1	D	T1, T2	CS, D			T1	D	T1, T2	CS, D			T1	D
Canada	T1, T3	CS, D	T1, T2	CS, D	T1, T2	CS, D	T1, T2, T3	CS, D	T2	CS	T2	CS			T1	D	T1	D
Croatia	T1, T2	CS, D	T1	D	T1	D	T1, T2	CS, D	T1	D	T1, T2	CS, D	T1	CS, D	T1	D	T1	D
Cyprus	T1	OTH					T1, T2	OTH					T1	OTH				
Czechia	T2	CS, D	T2	CS, D	T2	CS, D	T1, T2	CS, D			T1, T2	CS, D	T1, T2	CS, D				
Denmark (KP)					T1	D					T1	D	T1, T2	CS, D	T1	D	T1	D
Denmark (Convention)					T1	D					T1	D	T1, T2	CS, D	T1	D	T1	D
Estonia	T1, T2	CS, D, OTH	T1, T2	D	T1, T2	D	T1, T2	CS, D, OTH			T1	D	T1, T2	CS, D, OTH	T2	D	T2	D
European Union (KP)																		
European Union (Convention)																		
Finland	T2, T3	CS	T1, T2	CS, D	T1, T2	CS, D	T1, T2, T3	CS, D			T1	CS, D	T2, T3	CS, D	T2	D	T1, T2	D
France (KP)	T1, T2	CS, D	T1, T2	CR, D	T1, T2	CR, D	T1, T2	CS, D	T1, T2	D	T1, T2	D	T1, T2	CS, D	T1, T2	D	T1, T2	D
France (Convention)	T1, T2	CS, D	T1, T2	CR, D	T1, T2	CR, D	T1, T2	CS, D	T1, T2	D	T1, T2	D	T1, T2	CS, D	T1, T2	D	T1, T2	D
Germany	CS, T2	CS	T2	CS, D	T2	CS, D	T2	CS	T2	CS	T2	CS, D	T2	CS	T2	CS	T2	CS, D
Greece	OTH, T1, T2	CS, D, OTH	T1	D	T1	D	T1, T2	CS, D			T1	D			T1	D	T1	D
Hungary	T1, T2	CS, D	T1, T2	CS, D	T1, T2	CS, D	T1, T2	CS, D	T2	D	T1, T2	D	T1, T2	CS, D	T1	D	T1	D
Iceland	T1, T2, T3	CS, D	T1	D	T2	CS	D, T1, T2, T3	CS, D	T1	D			T1, T2, T3	CS, D	T1	D	T3	CS
Ireland	CS, T1, T2, T3	CS	D, T1	CS, D	D, T1	CS, D	CS, D	D	D, T1	D	D, T1	D	D, T1, T2, T3	CS, D	D, T1	D	D, T1	D
Italy	T1, T2, T3	CS, D	T2	CS, D	T2	CS, D	T1, T2	CS, D	T1	D	T1	D	T1, T2, T3	CS, D	T1	CS	T1	CS
Japan	T1, T2, T3	CS, D	T1	D	T1, T2	CS, D	T1, T2, T3	CS, D	T1	CS, D	CS, T1	CS, D	T1, T2, T3	CS, D	T1	CS, D	CS, T1	CS, D
Kazakhstan	T2	CS	T2	D	T2	D	T2	CS					T2	CS	T1	D	T1	D
Latvia	T1, T2	CS, D	T1, T2	D	T1, T2	D	T2, T3	CS	T1	D	T1	CS	T1, T2, T3	CS, D	T1, T2	CS, D	T1	D
Liechtenstein	T2	CS					T2	CS			T2	CS	T2	CS			T2	CS
Lithuania	T1, T2	CS, D	T1, T2	D	T1, T2	D	T1, T2	CS, D	T1	D	T1, T2	D	T1, T2	CS, D	T1	D	T1, T2	CS, D
Luxembourg	T1, T3	CS, D					T1	CS, D			T1	D	T1	CS, D			T1	D
Malta							T1	D, OTH			T1	D	T1	D, OTH				
Monaco																		
Netherlands	T1, T2	CS, D	T1	CS, D	T1	CS, D	CS, T1	CS, D			D, T1	CS	CS, T1, T2	CS, D	CS	D	CS, D, T1	CS, D
New Zealand	T1, T2, T3	CS, D	T1, T2	CS, D	T1, T2	CS, D	T1, T2, T3	CS, D			T1, T2	CS, D	T1, T2, T3	CS, D	T1, T2	CS, D	T1, T2	CS, D
Norway	T1, T3	CS, D	T1	D	T1	D	T1, T2, T3	CS, D	T1	D	T1	D	T1, T2, T3	CS, D	T1	D	T1	D
Poland	T2, T3	CS, D	D, T2	CS, D	D, T1, T2	CS, D	T1, T2	D			T1	D	D, T1, T2	CS, D	D, T1	CS, D	D, T1	CS, D
Portugal	CS, T2	CS, D	D	D	D	D			D	D	D	D			D	D	D	D
Romania	T1, T2, T3	CS, D	T1	D	T1	D	T2	D			T1	D	T2	CS, D			T1	D
Russian Federation	CS, T2	CS, D	T1, T2	CS, D	T1, T2	CS, D	CS, T1	CS, D	T1	D			CS, T1, T3	CS	T1	D	T1	D
Slovakia	T1, T2	CS, D	T2	CS, D	T2	CS, D	T1, T2	CS, D			T2	CS, D	T1, T2	CS, D			T2	CS, D
Slovenia	CS, D, T1, T2, T3	CS, D	D, T1	D	D, T1	D	CS, D, T1, T2	CS, D			D, T1	D	D, T1, T2	CS, D			D, T1	D
Spain	CS, T1, T2	CS, D	CS	D	CS, T1	D	T1, T2	CS, D	T1	D	T1	D	T1, T2	CS, D	CS, T1	D	CS, T1	D
Sweden	T2, T3	CS	T1	CS, D	T1	CS, D	T2, T3	CS	T1	CS	T1	D	T2, T3	CS	T1	CS	T1	D
Switzerland	T2, T3	CS, M	T1	D	T1	D	T2, T3	CS, M			T1	D	T2, T3	CS, M	T1	D	T1	D
Turkey	T2	CS, D	T1	D	T1	D	T1, T2	CS, D			T1	CS, D	T1, T2	CS, D			T1	D
Ukraine	CS, T1, T2	CS, D	CS, T1	D	CS, T1	D	CS, T1, T3	CS, D	CS, T1	D	CS, T1	D	CS, T1, T3	CS, D	T1	D	T1	D
United Kingdom of Great Britain and Northern Ireland (KP)	CS, D, T1, T2, T3	CS, D	D, T1	CS, D	D, T1	CS, D	CS, D, T1, T2, T3	CS, D	D, T2	CS, D	D	CS, D	CS, D, T1, T2, T3	CS, D	D, T2	CS, D	D	CS, D
United Kingdom of Great Britain and Northern Ireland (Convention)	CS, D, T1, T2, T3	CS, D	D, T1	CS, D	D, T1	CS, D	CS, D, T1, T2, T3	CS, D	D, T2	CS, D		CS, D	CS, D, T1, T2, T3	CS, D	D, T2	CS, D	D	CS, D
United States of America	T2, T3	CS, D	T2	D	T1, T2	D	OTH, T2	CS, OTH					OTH, T2	CS, OTH	OTH	OTH	OTH	OTH

Table 4.1b

Methods and emission factors used (2019)

	Wetlands						Settlements						Other Land						Harvested Wood Products	
	CO ₂		CH ₄		N ₂ O		CO ₂		CH ₄		N ₂ O		CO ₂		CH ₄		N ₂ O		CO ₂	
	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF	Method	EF
Australia	T2, T3	CS, M	T3	CS	T3	CS	T2, T3	CS, M	CS	CS	CS, T2	CS	T2, T3	CS					T2, T3	D, M
Austria	T2, T3	CS					T2, T3	CS			T2, T3	CS	T2, T3	CS					T3	CS, D
Belarus	T1	D			T1	D													T2	D
Belgium	CS, T1	CS			T1	D	CS, T1	CS			T1	D							T2	D
Bulgaria	T1, T2	CS, D			T1	D	T1, T2	CS, D			T1	D							T2	D
Canada	T2, T3	CS	T2	CS	T2	D	T2, T3	CS	T2	CS	T2	CS							T3	CS
Croatia	T1	D			T1	D	T1, T2	CS, D			T1	D							T2	D
Cyprus							T1	OTH					T1	OTH						
Czechia	T1, T2	CS, D					T2	CS											T1, T2	D
Denmark (KP)			T1	D	T1	D					T1	D								
Denmark (Convention)			T1	D	T1	D					T1	D								
Estonia	T2	CS, D, OTH	T2	CS	T2	CS	T2	CS, D, OTH			T1	D	T2	CS, D, OTH			T1	D	T2	CS, D
European Union (KP)																				
European Union (Convention)																				
Finland	T1, T2, T3	CS, D	T1, T2	CS, D	T2	CS	T2, T3	CS			T1	D							T2	CS, D
France (KP)	T1, T2	CS, D	T1, T2	D	T1, T2	D	T1, T2	CS, D	T1, T2	D	T1, T2	D							T3	CS
France (Convention)	T1, T2	CS, D	T1, T2	D	T1, T2	D	T1, T2	CS, D	T1, T2	D	T1, T2	D							T3	CS
Germany	T2	CS	T2	CS	T2	CS	T2	CS	T2	CS	T2	CS, D							CS, T2	D
Greece					T1	D					T1	D								
Hungary	T1, T2	CS, D			T1	D	T1, T2	CS, D			T1	D	T2	CS, D			T1	D	T2	D
Iceland	T1, T2, T3	CS, D	T1, T3	CS, D			T1, T3	CS			CS	D							D	D
Ireland	D, T1, T2, T3	CS, D	D, T2	CS, D	D, T2	CS, D	D, T1, T3	CS, D, OTH			T1	D	T1, T3	CS			T1	D	T2	D
Italy	T1	D					T1	D			T1	D							T2	CS
Japan	T2	CS, D					T2	CS, D					T2	CS, D			T1	CS, D	T2, T3	CS, D
Kazakhstan							T1	CS												
Latvia	T1, T2	CS, D	T1, T2	CS, D	T2	CS	T1, T2	CS, D			T1	D							T2	CS
Liechtenstein	T2	CS			T2	CS					T2	CS	T2	CS			T2	CS	T2	CS
Lithuania	T1	D			T1	D	T1, T2	CS, D			T1, T2	CS, D	T1, T2	CS, D			T1, T2	CS, D	T1, T2	D
Luxembourg	T1	CS, D			T1	D	T1	CS, D			T1	CS	T1	CS			T1	D	T1	D
Malta	T1						T1	D, OTH			T1	D	T1	OTH			T1	D		
Monaco							T1, T2	D			T1	D								
Netherlands	T1, T2	CS, D			D, T1	CS	CS, T1, T2	CS, D			T1	CS	CS, T1, T2	CS, D			T1	CS	T1	D
New Zealand	T1, T2	CS, D			T1, T2	CS, D	T1, T2	CS, D			T1, T2	CS, D	T1, T2	CS, D			T1, T2	CS, D	T2	CS, D
Norway	T1, T2, T3	CS, D	T1	D	T1	D	T1, T2, T3	CS, D			T1	D							T2	D
Poland	T1	D			T1	D	T1, T2, T3	CS, D			T1	D							T2	D
Portugal																				
Romania	T1	D			T1	D	T1	D			T1	D	T1	D			T1	D	T1	D
Russian Federation	T1	CS, D	T1	CS, D	T1	D	CS	CS			T1	D	T1	CS					T1	D
Slovakia							T1, T2	CS, D			T2	CS, D	T1, T2	CS, D			T2	CS, D	T2	CS, D
Slovenia	D, T1, T2	CS, D					D, T2	CS, D			D, T1, T2	D	D, T2	CS, D			D, T2	D	D, T1	D
Spain	T1, T2	CS, D	T1	D	T1	D	T1, T2	CS, D			T1	D	T1, T2	CS, D			T1	D	T2	D
Sweden	T2, T3	CS	T1	CS	T1	CS	T2, T3	CS			T1	D	T2, T3	CS					T3	D
Switzerland	T2	CS	T2	D	T1	D	T2	CS			T1	D	T2	CS			T1	D	T2	D
Turkey	T1, T2	CS, D			T1	D	T1	D					T1	D					T2	CS, D
Ukraine	T1	CS, D	T1	CS, D	T1	D	T1	CS, D			T1	D	T1	CS, D			T1	D	T1	D
United Kingdom of Great Britain and Northern Ireland (KP)	D, T1, T2	CS, D	T2	CS, D	T2	CS, D	CS, D, T1, T2, T3	CS, D	D	CS	D	CS, D							CS, T3	CS
United Kingdom of Great Britain and Northern Ireland (Convention)	D, T1, T2	CS, D	T2	CS, D	T2	CS, D	CS, D, T1, T2, T3	CS, D	D	CS	D	CS, D							CS, T3	CS
United States of America	T2	CS	T1	D	T1	D	OTH, T2, T3	CS, OTH			OTH, T1	D, OTH							T3	CS

Table 4.2

Forest land - AD, IEFs, carbon stock changes in pools and net CO₂ emissions/removals (2019)^{a, b}

	Forest land remaining forest land							Land converted to forest land						
	IEF (t C/ha)													
	CSC ^c in living biomass/area ^d			Net CSC ^c in dead wood/area	Net CSC ^c in litter/area	Net CSC ^c in soils/area ^{e, f}		CSC ^c in living biomass/area ^d			Net CSC ^c in dead wood/area	Net CSC ^c in litter/area	Net CSC ^c in soils/area ^{e, f}	
	Gains	Losses	Net Change			Mineral soils	Organic soils	Gains	Losses	Net Change			Mineral soils	Organic soils
IPCC default EF														
Australia	0.047	-0.019	0.028	0.005	0.003	0.022	IE, NA	0.47	IE, NO	0.47	0.10	0.001	-0.028	8.1
Austria	2.4	-2.0	0.30	0.058	IE, NE	-0.18	NO	1.7	-0.52	1.2	0.016	1.2	0.70	NO
Belarus	1.5	-0.68	0.80	0.035	0.052	0.27	NE	NE	NE	NE	NE	NE	NE	NE
Belgium	0.69	NO	0.69	NA	NA	NA	NO	1.7	-0.000	1.7	0.025	0.10	0.89	NO
Bulgaria	0.46	IE, NE	0.46	0.039	NA	NA	NO	2.4	-0.30	2.1	NA, NO	0.51	-0.79	NO
Canada	2.6	-2.5	0.14	0.13	-0.13	0.032	IE, NA	3.4	-1.3	2.0	0.24	0.27	-0.20	IE, NO
Croatia	1.8	-1.1	0.65	NA	NA	NA	NO	1.2	-0.005	1.2	0.017	0.23	-0.25	NO
Cyprus	0.28	-0.051	0.23	NO	NO	NO	NO	1.2	-0.007	1.2	0	0.019	0.88	NO
Czechia	3.2	-4.8	-1.6	0.012	NO	NO	NO	2.0	NO	2.0	0.023	0.54	0.28	NO
Denmark (KP)	0.14	NO	0.14	0.070	0.47	NA	-1.3	3.1	-0.082	3.0	0.005	0.30	0.16	-1.3
Denmark (Convention)	0.14	0.000	0.14	0.070	0.47	NA, NO	-1.3	3.1	-0.082	3.0	0.005	0.30	0.16	-1.3
Estonia	0.13	IE	0.13	0.011	NA	0.17	-0.19	0.34	IE	0.34	0.016	0.30	0.056	-0.34
European Union (KP)	1.3	-0.83	0.48	0.032	-0.017	0.079	-0.29	1.9	-0.70	1.2	0.027	0.22	0.19	-1.0
European Union (Convention)	1.3	-0.83	0.48	0.032	-0.017	0.079	-0.29	1.9	-0.71	1.2	0.027	0.22	0.18	-1.0
Finland	1.7	-1.5	0.27	IE	IE	0.14	-0.18	1.4	-0.27	1.1	NA	IE, NA	0.069	-1.2
France (KP)	1.7	-1.1	0.56	-0.020	NE	NE	NO	1.4	-0.16	1.2	0.051	0.28	0.072	NO
France (Convention)	1.6	-1.1	0.54	-0.019	NE	NE	NO	1.4	-0.16	1.2	0.051	0.28	0.072	NO
Germany	1.0	IE	1.0	0.095	-0.012	0.41	-2.6	1.0	-2.3	-1.2	0.003	0.47	0.19	-2.6
Greece	0.18	IE, NO	0.18	NA, NO	NA, NO	NA, NO	NA, NO	1.3	-0.92	0.36	NE, NO	NE, NO	NE, NO	NO
Hungary	0.55	IE, NO	0.55	0.084	NA, NO	NA, NO	-2.6	2.2	-0.065	2.1	0.070	0.44	0.18	NO
Iceland	0.11	IE	0.11	IE, NA	NA	NA	-0.37	1.7	-0.011	1.7	IE, NA, NO	0.14	0.40	-0.37
Ireland	7.7	-6.6	1.17	IE	-0.19	-0.055	-0.45	7.1	-4.7	2.3	IE, NO	0.99	0.097	-0.75
Italy	2.4	-1.4	1.0	0.008	0.014	NA, NO	NO	2.6	-1.5	1.1	0.008	0.014	0.18	NO
Japan	0.59	-0.000	0.59	-0.017	0.003	0.022	NO	3.0	-0.001	3.0	0.65	0.28	0.15	NO
Kazakhstan	0.11	NO	0.11	0.005	0.004	0.030	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	3.0	-2.7	0.32	0.17	NA	NA	-0.52	0.30	IE, NO	0.30	0.085	0.081	NA, NO	-0.52
Liechtenstein	2.4	-2.4	0.04	0.013	-0.005	NO	NO	1.3	-1.3	0.019	NO	NO	NO	NO
Lithuania	0.73	IE	0.73	0.047	NA	NE	IE	1.7	IE	1.7	NO	0.12	0.57	IE
Luxembourg	3.1	-2.3	0.86	0.11	NO	NO	NO	3.1	-0.16	3.0	0.33	0.96	1.3	NO
Malta	NA	NA	NA	NA	NA	NA	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	3.2	-2.1	1.1	0.066	NO	NA	-0.93	4.0	-0.68	3.4	NE	NE	0.002	-1.0
New Zealand	1.6	-1.1	0.44	0.065	-0.006	0.000	-0.17	6.0	-1.8	4.3	0.64	0.27	-0.60	-0.68
Norway	1.1	-0.67	0.40	0.021	0.10	0.003	-0.25	0.93	-0.461	0.47	0.86	1.4	0.25	-0.93
Poland	0.33	IE	0.33	NA	NA	0.10	-0.68	0.76	-0.070	0.69	NA, NO	NA, NO	0.26	-0.68
Portugal	2.0	-1.4	0.59	IE	-0.002	-0.004	NO	2.3	-0.69	1.6	IE	0.083	0.37	NO
Romania	1.7	-0.71	0.96	NA	NA	NA	-0.68	1.2	NO	1.2	0.068	NO	1.8	NO
Russian Federation	0.32	-0.10	0.22	0.018	0.006	0.027	-0.71	0.025	-0.000	0.025	0.006	0.000	0.003	NA, NO
Slovakia	2.5	-1.9	0.61	NO	NO	NO	NO	1.5	NO	1.5	NO	0.42	1.1	NO
Slovenia	IE	-0.33	-0.33	0.18	NA	NA	NO	2.8	-1.5	1.3	0.19	0.14	0.26	NO
Spain	0.53	IE	0.53	NA	NA	NA	NO	1.3	IE, NO	1.3	0.054	0.13	0.53	NO
Sweden	0.32	IE	0.32	0.072	-0.11	0.15	-0.31	0.68	IE	0.68	0.028	0.33	-0.078	-1.4
Switzerland	2.9	-2.3	0.60	0.028	-0.034	0.002	-0.078	1.4	-0.89	0.54	0.15	0.69	1.1	-0.078
Turkey	1.4	-0.49	0.90	NO	NO	NO	NO	0.24	-0.005	0.23	NO	0.19	0.80	NO
Ukraine	1.6	-0.26	1.3	NA	NA	NA	-0.68	0.48	-0.019	0.46	NA	0.052	0.80	NO
United Kingdom of Great Britain and Northern Ireland (KP)	4.8	-4.0	0.75	0.31	0.035	0.40	0.18	1.2	-0.21	0.97	0.031	0.032	-0.82	-1.8
United Kingdom of Great Britain and Northern Ireland (Convention)	4.8	-4.0	0.75	0.31	0.035	0.40	0.18	1.2	-0.21	0.97	0.031	0.032	-0.82	-1.8
United States of America	0.47	IE	0.47	0.097	0.000	0.002	-0.048	16 854	IE	16 854	3 033	5 218	294	IE

^a The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).^b Where Parties directly estimate emissions and removals rather than carbon stock changes, they may use notation keys only in the stock change columns^c CSC = carbon stock change.^d Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.^e When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.^f Parties who wish to do so may report annual on-site CO₂-C emissions/removals and off-site CO₂-C emissions from drained and rewetted organic soils here.

Table 4.3

Cropland - AD, IEFs, carbon stock changes in pools and net CO₂ emissions/removals (2019)^{a, b}

	Cropland remaining cropland						Land converted to cropland					
	IEF (t C/ha)											
	CSC ^c in living biomass/area ^{d, e}			Net CSC ^e in DOM ^f /area ^g	Net CSC ^c in soils/area ^{h, i}		CSC ^c in living biomass/area ^{d, e}			Net CSC ^e in DOM ^f /area ^g	Net CSC ^c in soils/area ^{h, i}	
	Gains	Losses	Net Change		Mineral soils	Organic soils	Gains	Losses	Net Change		Mineral soils	Organic soils
IPCC default EF												
Australia	0.001	IE	0.001	NA	0.041	IE	IE, NA, NO	-0.11	-0.11	-0.029	-0.14	-20
Austria	0.036	-0.036	0.000	NO	0.022	NO	0.28	-0.29	-0.013	-0.031	-0.98	NO
Belarus	0.042	-0.051	-0.009	NE	NE	-1.0	NE	NE	NE	NE, NO	-1.5	-1.0
Belgium	0.000	-0.001	-0.000	NO	-0.039	-10	NO	-0.031	-0.031	-0.001	-1.5	NO
Bulgaria	0.018	-0.026	-0.009	NA	0.052	NE	0.015	NO	0.015	NA, NE, NO	-0.58	NE, NO
Canada	0.007	-0.006	0.002	-0.009	0.054	-5.0	NE, NO	-1.2	-1.2	-1.8	1.5	IE, NE, NO
Croatia	0.16	-0.20	-0.042	NO	-0.011	-10	0.51	-0.017	0.50	NO	-0.92	NO
Cyprus	0.90	-0.75	0.15	NO	NO	NO	0.49	-0.060	0.43	0	0.67	NO
Czechia	0.000	NO	0.000	NO	-0.005	NO	0.006	-0.22	-0.21	-0.003	-0.26	NO
Denmark (KP)	0.008	-0.012	-0.004	NO	-0.005	-7.6	0.55	-0.42	0.13	-0.083	-0.079	IE, NO
Denmark (Convention)	0.008	-0.012	-0.004	NO	-0.005	-7.6	0.55	-0.42	0.13	-0.083	-0.079	-0.87
Estonia	NO	NO	NO	NE	0.095	-6.1	IE, NO	-0.17	-0.17	-0.11	-0.45	-6.1
European Union (KP)	0.040	-0.025	0.015	-0.000	0.023	-6.1	0.24	-0.24	0.005	-0.015	-0.70	-6.1
European Union (Convention)	0.040	-0.026	0.015	-0.000	0.023	-6.0	0.24	-0.24	0.005	-0.015	-0.70	-6.1
Finland	0.000	NA	0.000	IE	-0.083	-6.3	0.15	-1.4	-1.2	-0.007	-0.49	-6.8
France (KP)	0.078	-0.080	-0.002	NE	0.13	IE	0.021	-0.30	-0.28	-0.020	-1.1	NO
France (Convention)	0.077	-0.080	-0.002	NE	0.13	IE	0.021	-0.30	-0.28	-0.020	-1.1	NO
Germany	0.007	-0.007	0.001	NO	-0.001	-9.3	0.37	-0.53	-0.16	IE, NO	-0.98	-8.9
Greece	0.074	-0.018	0.056	NO	NO	-10	NO	-0.005	-0.005	NO	-0.71	NO
Hungary	0.007	-0.012	-0.005	NO	0.026	NO	0.10	-0.21	-0.10	-0.11	-0.73	NO
Iceland	NA	NA	NA	NA	0.17	-7.9	0.11	-0.77	-0.67	IE, NA, NO	0.10	-7.9
Ireland	0.012	-0.015	-0.003	NO	0.043	NO	NO	NO	NO	NO	NO	NO
Italy	0.059	-0.082	-0.023	NO	0.086	-10	NO	-0.19	-0.19	NO	-1.7	NO
Japan	IE	-0.012	-0.012	NA	-0.25	-1.8	0.24	-0.60	-0.35	-0.18	IE	-2.6
Kazakhstan	0.11	NO	0.11	IE	-0.39	NO	NO	NO	NO	NO	NO	NO
Latvia	0.003	-0.002	0.001	-0.000	NA	-4.8	IE, NA, NE, NO	-0.012	-0.012	-0.11	-0.007	-4.8
Liechtenstein	NO	NO	NO	NO	NO	-9.5	0.34	-0.33	0.016	-0.005	-0.27	-9.5
Lithuania	0.042	-0.057	-0.015	NA	0.24	IE	IE, NE, NO	-0.082	-0.082	-0.039	-0.23	IE, NO
Luxembourg	0.017	-0.022	-0.005	NO	0.000	NO	0.24	-0.40	-0.16	-0.026	-1.2	NO
Malta	0.024	NA, NO	0.024	NA, NE	-0.001	NO	0.003	0.000	0.003	NE, NO	0.06	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	-3.5	0.45	-0.69	-0.23	-0.027	-0.53	-3.7
New Zealand	0.031	0	0.031	0	-0.000	-9.9	0.42	-0.059	0.36	-0.000	-0.79	-9.9
Norway	0.000	NO	0.000	NO	0.014	-7.9	0.286	-1.6	-1.3	-3.2	-0.32	-7.9
Poland	0.034	IE	0.034	NO	-0.000	-1.0	NO	NO	NO	NO	-0.16	-1.0
Portugal	0.031	-0.013	0.018	NA	0.005	NO	0.16	-0.37	-0.22	-0.028	-0.68	NO
Romania	0.052	IE	0.052	-0.005	0.051	-10.0	0.68	-0.12	0.56	-0.006	0.050	NO
Russian Federation	0.013	0	0.013	NO	NO	-5.9	NO	0	0	0	-1.6	NO
Slovakia	0.21	-0.006	0.20	NA	0.015	NE	NO	-0.013	-0.013	-0.001	-0.65	NE, NO
Slovenia	0.10	-0.098	-0.002	0.001	0.006	-10	0.31	-0.81	-0.49	-0.020	-0.52	NO
Spain	0.031	IE	0.031	NA	0.027	NO	0.11	-0.053	0.062	-0.005	-0.49	NO
Sweden	0.026	IE	0.026	0.001	-0.12	-6.2	0.10	-0.59	-0.49	-0.20	-0.23	-1.9
Switzerland	0.21	NO	0.21	NO	0.20	-9.5	0.10	-0.019	0.084	-0.001	-0.22	-9.0
Turkey	0.001	IE	0.001	NO	0.000	-0.010	0.16	-0.47	-0.31	-0.099	-0.23	NO
Ukraine	0.044	-0.051	-0.007	NA	-0.37	-5.0	NA, NO	-0.99	-0.99	NA, NO	0.84	NO
United Kingdom of Great Britain and Northern Ireland (KP)	0.000	0.000	-0.000	NA, NO	-0.33	-8.2	0.075	IE, NA, NO	0.075	IE, NO	-1.5	-5.1
United Kingdom of Great Britain and Northern Ireland (Convention)	0.000	0.000	-0.000	NA, NO	-0.33	-8.2	0.075	IE, NA, NO	0.075	IE, NO	-1.5	-5.1
United States of America	NE	NE	NE	NE	0.087	-14	IE, NE	-0.71	-0.71	-0.28	-0.064	-14

^a The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).^b Where Parties directly estimate emissions and removals rather than carbon stock changes, they may use notation keys only in the stock change columns^c CSC = carbon stock change.^d Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.^e For category cropland remaining cropland this column only includes changes in perennial woody biomass.^f DOM = dead organic matter.^g No reporting on DOM pools is required for category cropland remaining cropland.^h When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.ⁱ Parties who wish to do so may report annual on-site CO₂-C emissions/removals and off-site CO₂-C emissions from drained and rewetted organic soils here.

Table 4.4

Grassland - AD, IEFs, carbon stock changes in pools and net CO₂ emissions/removals (2019)^{a, b}

	Grassland remaining grassland						Land converted to grassland					
	IEF (t C/ha)											
	CSC ^c in living biomass/area ^d			Net CSC ^c in DOM ^e /area ^f	Net CSC ^c in soils/area ^{g, h}		CSC ^c in living biomass/area ^d			Net CSC ^c in DOM ^e /area ^f	Net CSC ^c in soils/area ^{g, h}	
	Gains	Losses	Net Change		Mineral soils	Organic soils	Gains	Losses	Net Change		Mineral soils	Organic soils
IPCC default EF												
Australia	0.020	-0.017	0.003	0.001	0.002	IE	IE, NA, NO	-0.36	-0.36	-0.14	-0.11	-5.0
Austria	NA	NA	NA	NO	0.002	-6.4	0.33	-0.9	-0.56	-0.33	0.93	NO
Belarus	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE, NO	IE, NE
Belgium	NO	NO	NO	NO	0.18	-1.9	NO	-0.61	-0.61	-0.047	1.7	NO
Bulgaria	0.022	-0.022	0.001	NA, NE	-0.007	NE	0.13	-0.017	0.11	NA, NO	0.64	NE, NO
Canada	NA, NO	NA, NO	NA, NO	NA, NO	NE, NO	NE, NO	NO	NO	NO	NO	NO	NO
Croatia	NO	NO	NO	NO	NO	-2.5	0.029	-0.071	-0.043	NO	1.0	NO
Cyprus	1.5	-1.2	0.25	NO	NO	NO	1.1	-0.009	1.1	0.028	0.90	NO
Czechia	NO	NO	NO	NO	0.024	NO	0.11	-0.073	0.039	-0.002	0.44	NO
Denmark (KP)	0.48	-0.67	-0.19	NO	IE	-6.4	0.30	-0.43	-0.13	-0.009	0.009	-10
Denmark (Convention)	0.13	-0.18	-0.050	NO	IE, NO	-5.9	0.30	-0.43	-0.13	-0.009	0.009	-10
Estonia	0.008	IE	0.008	NO	NA	-0.29	0.15	-0.30	-0.15	-0.13	0.45	-4.6
European Union (KP)	0.080	-0.062	0.018	0.002	0.031	-2.5	0.13	-0.22	-0.091	-0.014	0.68	-4.7
European Union (Convention)	0.087	-0.068	0.019	0.002	0.033	-3.1	0.13	-0.22	-0.094	-0.014	0.68	-4.7
Finland	0.37	-0.068	0.31	NE	NA	-3.5	0.20	-0.50	-0.30	NA, NE	0.15	-3.5
France (KP)	0.15	-0.12	0.026	NE	-0.000	IE	0.12	-0.22	-0.11	-0.021	0.91	NO
France (Convention)	0.14	-0.11	0.024	NE	-0.004	IE	0.12	-0.22	-0.11	-0.021	0.91	NO
Germany	0.14	-0.13	0.007	NO	0.008	-7.3	0.56	-0.43	0.13	-0.001	1.4	-7.9
Greece	NO	-0.000	-0.000	NO	NO	NO	NO	-0.11	-0.11	0.000	0.71	NO
Hungary	NA	NA	NA	NA	0.009	NA	0.055	-0.39	-0.34	-0.11	0.78	NO
Iceland	0.000	IE, NA	0.000	0.000	0.000	-5.7	0.069	IE, NA	0.069	0.001	0.50	-5.7
Ireland	NO	NO	NO	NO	0.14	-6.8	0.009	-0.028	-0.019	-0.008	0.046	-3.9
Italy	0.45	-0.37	0.076	0.004	0.026	2.5	NO	NO	NO	NO	1.2	NO
Japan	NA	NA	NA	NA	-0.296	-0.13	0.33	-0.26	0.07	-0.071	IE, NO	-0.19
Kazakhstan	0.001	NO	0.001	0.000	0.019	NO	NO	NO	NO	NO	NO	NO
Latvia	0.11	-0.017	0.092	0.011	NA	-4.4	0.009	-0.016	-0.008	-0.028	NA, NO	-2.9
Liechtenstein	0.067	-0.064	0.003	NO	0.021	-7.8	0.37	-1.2	-0.88	-0.32	0.23	-9.4
Lithuania	NA	NA	NA	NA	NE	IE	0.027	IE, NE, NO	0.027	0.038	0.30	IE, NO
Luxembourg	NA	NA	NA	NO	NA	NO	0.57	-0.70	-0.13	-0.052	1.3	NO
Malta	0.000	NE, NO	0.000	NE, NO	0.009	NO	NO	NO	NO	NE, NO	-1.0	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	0.043	-0.034	0.009	NA	0.003	-4.1	0.72	-0.73	-0.011	-0.10	0.75	-3.8
New Zealand	0.007	-0.004	0.003	0.000	-0.001	-2.2	0.17	-4.5	-4.3	-0.47	0.57	-1.9
Norway	0.014	-0.005	0.009	NO	-0.001	-3.6	1.2	-2.5	-1.2	-3.1	0.25	-3.6
Poland	NO	NO	NO	NO	-0.002	-0.25	0.18	IE, NO	0.18	NO	0.91	-0.25
Portugal	NA	NA	NA	NA	0.22	NO	0.055	-0.25	-0.19	-0.011	-0.44	NO
Romania	0.136	NE, NO	0.14	NE	NE	-2.5	0.001	-0.29	-0.29	-0.002	0.10	NE, NO
Russian Federation	NA	NA	NA	NA	NA, NO	-5.8	0.009	NA, NO	0.009	0.050	0.41	-5.8
Slovakia	NO	NO	NO	NO	NA	NO	0.008	-0.053	-0.045	-0.007	0.70	NO
Slovenia	0.37	-0.14	0.23	0.061	-0.011	NO	0.16	-0.51	-0.35	-0.057	0.47	NO
Spain	NE	NE	NE	NA	NE	NO	IE, NO	-0.88	-0.88	-0.084	0.40	NO
Sweden	0.19	IE	0.19	0.18	-0.33	-1.6	0.10	-1.1	-0.25	0.000	0.000	-6.2
Switzerland	0.034	-0.015	0.019	NO	-0.12	-9.1	0.13	-0.88	-0.75	-0.21	0.39	-8.9
Turkey	NA	NA	NA	NA	NA	-0.003	0.006	-2.6	-2.6	-0.30	-0.11	NO
Ukraine	NA, NO	NA, NO	NA, NO	NA, NO	0.006	-0.25	NA	NA	NA	NA	0.36	NO
United Kingdom of Great Britain and Northern Ireland (KP)	0.002	-0.004	-0.001	NA	0.15	-0.60	0.003	-0.088	-0.085	-0.007	0.65	-2.3
United Kingdom of Great Britain and Northern Ireland (Convention)	0.002	-0.004	-0.001	NA	0.15	-0.60	0.003	-0.088	-0.085	-0.007	0.65	-2.3
United States of America	IE	-0.001	-0.001	-0.002	-0.006	-3.4	IE, NE	-0.15	-0.15	-0.054	0.54	-3.0

^a The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).^b Where Parties directly estimate emissions and removals rather than carbon stock changes, they may use notation keys only in the stock change columns.^c CSC = carbon stock change.^d Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.^e DOM = dead organic matter.^f No reporting on DOM pools is required for category grassland remaining grassland.^g When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.^h Parties who wish to do so may report annual on-site CO₂-C emissions/removals and off-site CO₂-C emissions from drained and rewetted organic soils here.

Table 4.5

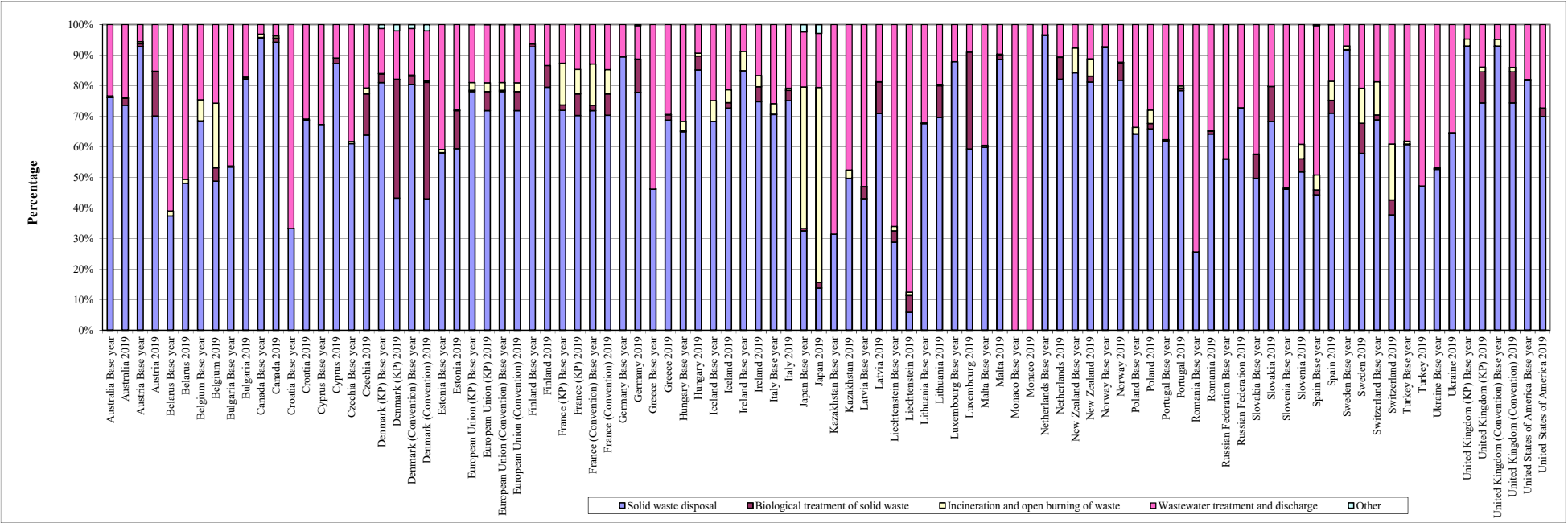
Land Area (2019)

Area (kha)	CRF						Total	FAO ^a	difference %	FAO ^a	difference %
	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land		Total country area		Forest	
Australia	134 095	39 988	519 419	13 106	1 529	60 692	768 829	774 122	0.69	134 005	-0.07
Austria	4 052	1 404	1 321	154	573	883	8 387	8 388	0.01	3 892	-3.96
Belarus	9 668	5 820	2 571	147	202	499	18 907	20 760	9.80	8 739	-9.62
Belgium	703	951	649	53	697	NO	3 053	3 053	0.00	689	-2.02
Bulgaria	3 935	3 672	2 551	232	536	175	11 100	11 100	0.00	3 867	-1.72
Canada	225 605	47 414	6 315	485	1 019	NE, NO	280 837	987 975	251.80	347 002	53.81
Croatia	2 384	1 527	1 153	75	286	233	5 659	8 807	55.62	1 934	-18.88
Cyprus	163	246	131	4.1	71	3.6	619	925	49.49	173	6.06
Czechia	2 676	3 185	1 018	167	842	IE, NA, NO	7 887	7 887	0.00	2 673	-0.08
Denmark (KP)	640	2 806	171	126	537	26	4 306	-	-	-	-
Denmark (Convention)	640	2 806	413	127	543	216 386	220 915	4 292	-98.06	627	-2.15
Estonia	2 450	986	276	31	357	41	4 141	4 534	9.49	2 438	-0.48
European Union (KP)	166 895	124 741	95 158	25 648	30 872	15 552	458 865	-	-	-	-
European Union (Convention)	166 739	124 591	87 992	24 743	30 813	12 431	447 308	441 645	-1.27	162 040	-2.82
Finland	21 853	2 496	247	6 435	1 503	1 310	33 843	33 845	0.00	22 409	2.55
France (KP)	23 701	18 157	14 032	1 160	5 822	985	63 858	-	-	-	-
France (Convention)	24 684	18 216	15 036	1 181	5 875	1 555	66 547	54 909	-17.49	17 086	-30.78
Germany	11 008	12 620	6 771	741	4 614	37	35 790	35 758	-0.09	11 419	3.73
Greece	3 476	3 022	5 519	301	608	273	13 198	13 196	-0.02	3 902	12.26
Hungary	2 054	5 201	1 196	264	585	2.5	9 303	9 303	0.00	2 056	0.08
Iceland	142	140	5 896	903	36	3 120	10 238	10 300	0.61	50	-64.88
Ireland	777	739	4 216	1 225	125	30	7 112	7 028	-1.18	774	-0.34
Italy	9 524	9 001	8 065	586	2 302	655	30 134	30 207	0.24	9 459	-0.69
Japan	24 934	4 223	947	1 348	3 869	2 476	37 798	37 797	0.00	24 935	0.00
Kazakhstan	19 045	35 940	188 718	8 793	2 279	17 718	272 493	272 490	0.00	3 396	-82.17
Latvia	3 244	1 470	1 027	400	313	5.4	6 459	6 457	-0.03	3 403	4.92
Liechtenstein	6.3	1.6	4.9	0.38	1.9	1.0	16	16	-0.28	6.7	7.05
Lithuania	2 215	1 982	1 577	364	382	8.4	6 529	6 529	0.01	2 198	-0.79
Luxembourg	96	59	76	1.2	26	0.054	259	259	0.15	89	-7.80
Malta	0.072	12	9.6	0.025	9.0	0.46	32	32	1.47	0.46	538.89
Monaco	NO	NO	NO	NO	0.20	NO	0.20	7.5	-	-	-
Netherlands	360	814	1 473	822	643	41	4 153	4 154	0.02	368	2.26
New Zealand	9 938	476	14 619	759	237	896	26 925	26 771	-0.57	9 855	-0.84
Norway	12 129	938	11 439	3 735	707	3 431	32 378	62 522	93.10	12 164	0.29
Poland	9 439	13 885	4 181	1 374	2 310	81	31 271	31 269	0.00	9 459	0.21
Portugal	4 370	2 392	638	199	514	1 126	9 239	9 223	-0.18	3 312	-24.20
Romania	6 987	8 766	4 964	1 119	1 595	391	23 822	23 840	0.07	6 929	-0.83
Russian Federation	895 337	90 887	164 094	251 427	16 367	359 596	1 777 708	1 709 825	-3.82	815 312	-8.94
Slovakia	2 027	1 526	851	94	239	167	4 904	4 903	-0.01	1 926	-4.99
Slovenia	1 208	243	413	14	117	32	2 027	2 048	1.02	1 242	2.78
Spain	15 685	20 004	11 894	420	1 491	1 157	50 651	50 596	-0.11	18 564	18.35
Sweden	28 158	2 796	522	7 398	1 913	4 347	45 134	44 743	-0.87	27 980	-0.63
Switzerland	1 265	390	1 378	188	333	575	4 129	4 129	0.00	1 262	-0.21
Turkey	22 984	27 149	24 116	1 973	944	1 479	78 644	78 535	-0.14	21 908	-4.68
Ukraine	10 687	34 977	7 534	3 398	2 858	900	60 355	60 355	0.00	9 678	-9.44
United Kingdom of Great Britain and Northern Ireland (KP)	3 569	4 639	14 320	983	1 827	421	25 758	-	-	-	-
United Kingdom of Great Britain and Northern Ireland (Convention)	3 569	4 639	14 320	984	1 831	421	25 764	24 361	-5.44	3 173	-11.09
United States of America	279 387	161 900	286 444	2 986	6 468	NA, NE	737 184	983 151	33.37	309 795	10.88

^a Source of international statistics: FAOSTAT data, downloaded on 20 May 2021 from <http://www.fao.org/faostat/en/#data/RL>. At the time of the download data for 2019 was not available, therefore, data for 2018 is shown in the table.

Figure 5.1

Contribution of subsectors to total GHG emissions in the Waste sector^{a, b}



^a In accordance with the UNFCCC reporting guidelines on annual inventories of Annex I Parties the year 1990 should be the base year for the estimation and reporting of inventories. However, in accordance with decisions 9/CP.2, 11/CP.4, and 7/CP.12 some Parties with economies in transition use base years other than 1990: Bulgaria (1988), Croatia (1990), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989) and Slovenia (1986).

^b Indirect CO₂ emissions are excluded from the totals in this graph.

Table 5.1a

Solid waste disposal on land, biological treatment of solid waste, incineration and open burning of waste and wastewater treatment and discharge (2019)

	Solid waste disposal																			Biological treatment of solid waste													
	CH ₄						CH ₄ IEF						CH ₄						N ₂ O														
	Methods and EF used		Share of national total ^a	Emissions per capita ^b	CH ₄ IEF			Methods and EF used		Share of national total ^a	Emissions per capita ^b	IEF		Methods and EF used		Share of national total ^a	Emissions per capita ^b	IEF															
					Composting	Anaerobic digestion	Composting					Anaerobic digestion																					
	Methods	EF	(%)	(kg CO ₂ eq.)	(t/t)	(t/t)	(t/t)	Methods	EF	(%)	(kg CO ₂ eq.)	g/kg	g/kg	Methods	EF	(%)	(kg CO ₂ eq.)	g/kg	g/kg														
IPCC default EF																																	
Australia	T2, T3	D	1.68	361	0.018	NO	NO	T1	CS	0.02	4.4	0.75	NE, NO	T1	CS	0.03	6.8	0.10	NE, NO														
Austria	T2	CS, D	1.11	99	0.22	NO	NO	T1, T2	CS, D	0.10	9.4	1.8	107	T2	CS	0.12	11	0.25	NA, NO														
Belarus	T2	D	3.13	300	IE, NE, NO	IE, NE	0.034	—	—	—	—	—	—	—	—	—	—	—	—														
Belgium	T2	D	0.56	57	0.029	NO	NO	T1	CS	0.02	2.0	0.75	NO	T1	CS	0.03	3.1	0.10	NO														
Bulgaria	T2	CS, D	4.57	368	0.025	0.24	NO	T1	D	0.02	1.4	10	NO	T1	D	0.01	0.98	0.60	NO														
Canada	CS	CS	3.56	0.69	0.050	1.5	NO	T3	PS	0.03	0.005	2.0	IE, NA	T3	PS	0.03	0.005	0.17	NA														
Croatia	T2	CS	5.10	296	0.032	0.024	NO	T1	D	0.02	1.2	10	IE	T1	D	0.03	0.87	0.60	NA														
Cyprus	T2	D	5.64	567	0.010	NO	NO	T1	D	0.07	6.9	4.5	2.0	T1	D	0.05	4.9	0.27	NE, NO														
Czechia	T1	D	2.75	318	0.046	NO	NO	CS, D, T1	CS, D	0.52	60	4.0	IE, NE	T1	D	0.06	6.9	0.24	IE, NO														
Denmark (KP)	CS, T2	CS, D	1.21	92	0.008	NO	NO	CS, T1	CS, OTH	0.92	70	NO	NE, NO	CS, T1	CS, OTH	0.17	13	NO	NA, NO														
Denmark (Convention)	CS, T2	CS, D	1.18	92	0.008	0.021	NO	CS, T1	CS, OTH	0.88	69	NO	NE, NO	CS, T1	CS, OTH	0.16	13	NO	NA, NO														
Estonia	T2	D	1.24	0.14	0.12	NO	NO	T1	D	0.15	0.017	10	NE, NO	T1	D	0.11	0.012	0.60	NE, NO														
European Union (KP)			2.38	1.4	0.027	0.85	NA, NO			0.14	0.081	4.7	57			0.07	0.040	0.28	0.021														
European Union (Convention)			2.38	1.4	0.027	0.93	NA, NO			0.14	0.081	4.7	57			0.07	0.040	0.28	0.021														
Finland	T2	CS, D	2.68	258	0.026	NO	NO	T1	D	0.15	14	5.6	1.0	T1	D	0.09	8.9	0.34	NA														
France (KP)	T2	CS, D	2.92	0.19	0.032	NO	NO	T2	CS	0.25	0.016	8.3	6.1	T2	CS	0.05	0.003	0.14	NA														
France (Convention)	T2	CS, D	2.93	0.19	0.032	0.016	NO	T2	CS	0.25	0.016	8.3	6.1	T2	CS	0.05	0.003	0.14	NA														
Germany	T2	CS	0.89	86	0.552	NO	NO	T2	CS	0.09	8.4	1.4	45	T2	CS	0.04	3.7	0.074	0.067														
Greece	T2	CS, D	3.88	303	0.018	0.37	NO	D	D	0.08	6.2	10	NE	D	D	0.02	1.8	0.60	NO														
Hungary	T2	D	4.54	299	0.017	NO	NO	D, T1	D	0.18	11.6	10	160	T1	D	0.06	4.3	0.60	NA, NO														
Iceland	T2	CS, D	3.45	456	0.038	0.019	NO	T2	CS, D	0.05	6.7	10	NO	T1	D	0.04	4.8	0.60	NO														
Ireland	T2	CS, D	1.13	138	0.10	IE	NO	T1	D	0.04	5.5	10	2.0	T1	D	0.03	3.6	0.60	NO														
Italy	T2	CS	3.27	227	0.059	NO	NO	D	CS, D	0.03	1.9	1.6	2.0	D	D	0.12	8.2	0.60	NA, NO														
Japan	T3	CS	0.23	22	0.271	NO	0.62	T2	CS	0.01	0.70	2.8	NE	T2	CS	0.02	2.3	0.78	NO														
Kazakhstan	M	CS, M	0.70	134	0.019	0.020	NO	—	—	—	—	NO	NO	—	—	—	NO	NO	NO														
Latvia	T2	CS, D	3.70	214	0.022	NO	NO	D	D	0.38	22	10	11	D	D	0.16	9.2	0.60	NO														
Liechtenstein	T2	CS	0.05	2.5	NO	NO	NO	CS	CS	0.03	1.4	1.0	NO	CS	CS	0.02	0.85	0.050	NO														
Lithuania	T2	D	2.81	205	0.056	0.19	NO	T1	D	0.30	22	10	NE	T1	D	0.12	8.9	0.60	NO														
Luxembourg	T1	D	0.43	65	0.13	IE, NO	NO	T1	D	0.18	27	10	IE, NE	T1	D	0.05	7.8	0.60	NA														
Malta	M, T2	M	6.50	275	0.020	NA	NO	T1	D	0.09	3.9	NO	0.80	—	—	—	NO	NA	NA														
Monaco	—	—	—	—	NO	NO	NO	—	—	—	—	NO	NO	—	—	—	NO	NO	NO														
Netherlands	T2	CS	1.31	—	0.036	NA, NO	NO	T1	CS	0.06	—	0.87	25	T1	CS	0.05	—	0.086	0.046														
New Zealand	T2	CS, D	3.27	535	0.016	0.010	NO	T1	D	0.05	7.5	4.0	NO	T1	D	0.03	5.4	0.24	NO														
Norway	T2	D	1.73	163	1.2	NO	NO	T1	D	0.07	7.1	4.0	0.80	T1	D	0.05	4.4	0.24	NO														
Poland	T2	CS, D	2.02	206	0.034	NO	NO	T1	D	0.03	3.2	6.7	NA, NO	T1	D	0.02	2.3	0.40	NA, NO														
Portugal	T2	CS, D	5.61	347	0.037	NO	NA, NO	T1	D	0.04	2.5	10	2.0	T1	D	0.02	1.3	0.60	NO														
Romania	T2	CS, D	3.42	197	0.015	NO	NA	T1	D	0.03	1.7	10	NO	T1	D	0.02	1.2	0.60	NO														
Russian Federation	T2	CS, D	3.44	497	0.037	0.025	NO	T1	D	0.00	0.064	10	NO	T1	D	0.00	0.046	0.60	NO														
Slovakia	T2	CS	2.81	206	0.035	NO	NO	T1	D	0.27	20	10	NO	T1	D	0.20	14	0.60	NO														
Slovenia	T2	CS, D	1.32	107	0.068	NO	NO	T1	D	0.06	5.2	10	NO	T1	D	0.05	3.7	0.60	NO														
Spain	T2	CS, D, OTH	3.13	209	0.031	NO	NO	T1	D	0.11	7.4	10	87	T1	D	0.07	4.9	0.60	NE, NO														
Sweden	T2	CS, D	1.24	61	0.042	NO	NO	T1, T2	CS, D	0.16	8.0	11	126	T1	D	0.05	2.5	0.69	NA, NO														
Switzerland	T2	CS, D	0.62	33	NO	NO	NO	T2	CS	0.06	3.2	1.0	0.17	T2	CS	0.02	1.1	0.050	NO														
Turkey	T2	D	1.60	98	0.001	0.052	NO	T1	D	0.00	0.15	4.0	NO	T1	D	0.00	0.24	0.30	NA														
Ukraine	T3	CS, D	2.37	177	0.019	0.025	NO	T1	D	0.00	0.10	4.0	NA	T1	D	0.00	0.087	0.30	NA														
United Kingdom of Great Britain and Northern Ireland (KP)	T2	CS	3.17	215	0.012	NO	NO	T1	D	0.27	18	10	1.1	T1	D	0.16	11	0.60	NO														
United Kingdom of Great Britain and Northern Ireland (Convention)	T2	CS	3.17	215	0.012	NO	NO	T1	D	0.27	18	10	1.1	T1	D	0.16	11	0.60	NO														
United States of America	CS	CS	1.75	343	0.021	NO	NO	D	D	0.04	7.3	4.0	0.80	D	D	0.03	6.1	0.30	IE, NO														

^a The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Cyprus, Czechia, Denmark (KP), Denmark (Convention), European Union (Convention), European Union (KP), Finland, Japan, Latvia, Netherlands, Portugal, Slovakia and Switzerland.^b Calculated using population data from CRF Table 5.D.

Table 5.1b

Solid waste disposal on land, biological treatment of solid waste, incineration and open burning of waste and wastewater treatment and discharge (2019)

	Activity data		Incineration and open burning of waste								Wastewater treatment and discharge										
			CO ₂				CH ₄				N ₂ O										
	Methods and EF used		Share of national total ^a	Emissions per capita ^a	IEF		Methods and EF used		Share of national total ^a	Emissions per capita ^a	CH ₄ IEF		Methods and EF used		Share of national total ^a	Emissions per capita ^a	N ₂ O IEF				
	Methods	EF			Waste incineration	Open burning of waste	Methods	EF			Domestic	Industrial	Methods	EF			Domestic	Industrial			
	CRF	World Bank ^b			(%)	(kg CO ₂ eq.)	kg/t	kg/t			(%)	(kg CO ₂ eq.)	kg/kg	kg/kg			(%)	(kg CO ₂ eq.)	kg N ₂ O-N/kg N	kg N ₂ O-N/kg N	
IPCC default EF ^c																			0.005		
Australia	25	25	T2	CS	0.01	1.2	1 413	NO	T2, T3	CS, D	0.46	98	0.078	0.074	CS	D	0.089	19	0.007	IE	
Austria	8.9	8.9	T2	CS	0.00	0.23	2 052	NO	T2, T3	CS, D	0.028	2.6	0.16	NA	CS	CS, D	0.21	19	0.031	0.005	
Belarus	9.4	9.5			0.08	7.2	NE, NO	293	T1	D	3.1	300	0.19	0.075	T1	D	0.17	16	0.005	NE	
Belgium	11	11	T1, T3	PS	0.24	25	5 324	NO	CR, T1	CR, D	0.21	21	NE	IE, NA, NE	D	D	0.087	8.9	NE	NA	
Bulgaria	7.0	7.0	T1	D	0.01	0.99	1 548	NO	T1	D	0.71	58	0.074	0.038	T1	D	0.25	20	0.005	NA	
Canada	37 589	38	T2, T3	CS, D, OTH	0.01	0.003	289	NE, NO	CS, T3	CS, D, PS	0.073	0.014	0.11	NA	D	D	0.067	0.013	0.005	NE	
Croatia	4.1	4.1			—	—	NO	NO	T1	D	1.9	111	0.25	0.002	T1	D	0.39	22	0.005	NA	
Cyprus	0.88	1.2			—	—	NO	NO	T1	D	0.51	52	0.025	0.079	OTH, T1	D, OTH	0.19	19	0.005	NE	
Czechia	11	11	T1	CS, D	0.08	9.7	1 144	NO	CS, T1	CS, D	0.73	85	0.16	0.015	T1	CS, D	0.16	19	0.005	NE	
Denmark (KP)	5.8	NA	NA	NA	—	—	NO	NO	CS	0.12	9.0	0.089	IE, NO	CS	CS	0.32	25	0.077	0.074		
Denmark (Convention)	5.9	5.8	T1	CS	0.01	0.54	296	154	CS, NA, T1	CS, D, NA	0.12	9.6	0.089	IE, NA, NO	CS, T1	CS, D	0.33	25	0.057	0.097	
Estonia	1 325	1.3	T1, T2	D	0.00	0.000	1 668	168	T1	D	0.36	0.040	0.066	0.20	T1	D	0.22	0.025	0.005	NO	
European Union (KP)	68 782	504			0.07	0.040	730	4.2		0.45	0.27	0.12	0.022			0.18	0.11	0.005	0.093		
European Union (Convention)	68 782	504			0.07	0.040	731	4.2		0.45	0.26	0.12	0.022			0.18	0.11	0.005	0.093		
Finland	5.5	5.5			—	—	IE, NO	NE, NO	CS, T2	CS, D	0.31	30	0.042	0.001	CS, T1	D	0.14	13	0.005	0.005	
France (KP)	67 028		T1, T2	CS, D	0.31	0.020	4 033	114	T1	D	0.52	0.034	0.092	0.59	T1	D	0.091	0.006	0.002	NA	
France (Convention)	67 006	67	T1, T2	CS, D	0.31	0.020	4 033	114	T1	D	0.52	0.034	0.093	0.59	T1	D	0.092	0.006	0.002	NA	
Germany	83	83	T1	CS	—	—	NO	NO	CS, D, T2	CS, D	0.061	6.0	0.19	0.001	CS, D, T2	CS, D	0.063	6.2	0.006	IE	
Greece	11	11	D	CS, D	0.00	0.31	508	NO	CS, D	CS, D	1.3	103	0.023	0.20	D	CS	0.34	27	0.005	NE	
Hungary	9.8	9.8	T2, T3	CS, D	0.05	3.1	1 519	NO	T1	D	0.37	24	0.12	0.013	CS	D	0.13	8.8	0.006	NE	
Iceland	0.36	0.36	T1, T2, T3	D	0.18	23	420	NO	T1	CS, D	0.89	117	0.12	0.025	T1	D	0.13	17	0.005	IE	
Ireland	4.9	4.9	T1	D	0.05	6.5	2 933	1 429	T1, T2	CS, D	0.086	10	0.060	IE, NO	T1	D	0.17	20	0.005	IE	
Italy	60	60	D, T1	CS, D	0.01	0.92	552	5.9	T1	D	0.59	41	0.16	0.25	T1	CR, D	0.32	22	0.005	0.25	
Japan	127	126	CS	CS	0.95	90	369	121	CS, D	CS, D	0.13	13	NA	NA	CS, D	CS, D	0.17	16	NA	0.005	
Kazakhstan	19	19	T1	D	0.00	0.31	NO	NO	T1	D	0.56	107	0.13	0.075	T1	D	0.11	21	0.005	NO	
Latvia	1.9	1.9	D	D	0.00	0.015	1 199	NE	T1, T2	CS, PS	0.68	40	0.071	0.008	D	D	0.29	17	0.005	0.005	
Liechtenstein	0.039	0.038	CS	CS	0.01	0.25	NO	244	CS	CS	0.42	20	NA	IE, NO	D	D	0.34	17	NA	IE, NO	
Lithuania	2.8	2.8	T1	D	0.01	0.60	973	NO	T1	D	0.59	43	0.050	0.017	IE, NA	T1	D	0.21	15	0.005	NA
Luxembourg	0.71	0.62			—	—	IE, NO	NO	T1	CS	0.020	3.0	0.16	NO	T1	D, PS	0.046	6.9	0.006	0.010	
Malta	0.51	0.50	T1	D	0.03	1.1	108	NO	D	CS	0.34	14	0.017	IE, NO	D	D	0.38	16	0.003	IE	
Monaco	0.039	0.039			—	—	IE, NO	NO	T3	CS, D	0.48	10	0.013	IE	T1	D	0.61	13	0.005	IE	
Netherlands	—	17	CS	CS	—	—	IE, NA	NO	T1, T2	CS, D	0.13	—	0.054	0.17	T1, T2	D	0.042	—	IE	NE	
New Zealand	5.0	4.9	T1	D	0.11	18	226	186	T1, T2	CS	0.31	50	0.032	0.023	T1, T2	CS, D	0.14	24	0.005	0.005	
Norway	5.3	5.3	D	OTH	0.00	0.18	53	NE, NO	T1	CS, D	0.11	10	0.035	0.025	CS, T1	CS, D	0.16	15	0.008	NE	
Poland	38	38	T1, T2	CS, D	0.12	12	667	NA	T1, T2	CS, D	0.66	67	0.18	0.033	T1	D	0.20	20	0.005	NA	
Portugal	10	10	T1, T2	CS, D	0.05	3.0	958	NO	T2	CS, D	1.2	71	0.11	0.018	D	CS, D	0.28	17	0.004	IE	
Romania	19	19	D	D	0.01	0.48	238	NO	D	D	1.5	84	0.15	0.016	D	D	0.39	22	0.005	NE	
Russian Federation	147	144			—	—	IE, NO	NE, NO	T1, T2	CS, D	1.2	166	0.21	0.077	T1	CS, D	0.13	19	0.005	NO	
Slovakia	5.5	5.5	T2	CS, D	0.00	0.061	117	NO	T1, T2	D	0.71	52	0.30	0.025	T1, T2	D	0.12	8.9	0.005	0.005	
Slovenia	2.1	2.1	T1	D	0.12	9.8	2 365	NO	T1	CS, D	0.78	63	0.093	0.002	T1	D	0.22	18	0.005	NA	
Spain	47	47			—	—	IE, NO	NO	T1, T2	CS, D	0.56	57	0.066	0.010	D	D	0.26	17	0.005	NE	
Sweden	10	10	T3	PS	0.24	12	773	NE	T2	CS	0.059	2.9	0.21	1.8	T1	CS, D	0.39	19	0.021	0.005	
Switzerland	8.6	8.6	T1, T2	CS	0.02	1.1	77	NO	T2	CS, D	0.41	22	0.26	IE	D	D	0.23	12	0.005	IE	
Turkey	83	83	T2	CS, D	0.00	0.015	IE, NO	202	T2	CS	0.55	34	0.075	0.013	T1	D	1.2	76	0.014	IE	
Ukraine	44	44	T1, T2	D	0.00	0.078	31	NE	T2	CS, D	0.98	73	0.12	0.030	CS, T1	CS, D	0.33	24	0.010	0.004	
United Kingdom of Great Britain and Northern Ireland (KP)	67		T1, T2	CS, D	0.05	3.7	738	NE, NO	CS, T1	CS, D	0.37	25	0.018	0.037	CS, T1	CS, D	0.22	15	0.004	NE	
United Kingdom of Great Britain and Northern Ireland (Convention)	67	67	T1, T2	CS, D	0.05	3.7	738	NE, NO	CS, T1	CS, D	0.37	25	0.018	0.037	CS, T1	CS, D	0.23	15	0.004	NE	
United States of America	334	328			—	—	IE	NA	CS, D, T2	CS, D	0.28	55	0.13	0.049	CS, D, T2	CS, D	0.40	79	0.060	0.035	

^a Source of population data: World Bank <https://data.worldbank.org/indicator/SP.POP.TOTL>, downloaded on 20 May 2021.^b The national total includes indirect CO₂ emissions from the atmospheric oxidation of CH₄, CO and NMVOCs for the following Parties: Canada, Czechia, Denmark (KP), Denmark (Convention), European Union (KP), European Union (Convention), Finland, Japan, Latvia, Netherlands, Portugal and Switzerland.^c Calculated using population data from CRF Table 5.D.^d Source of default emission factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 5 Chapter 6 Wastewater Treatment and Discharge, page 6.28.

Table 6.1Selected values (forest parameters), elected activities under Article 3.4, accounting period, forest management cap ^a

	Minimum value for 'tree crown cover' (%) ^b	Minimum 'tree height' (m) ^b	Minimum area for 'Forest land' (ha) ^b	Cropland Management ^c	Grazing Land Management ^c	Revegetation ^c	Wetland drainage and rewetting ^c	Harvest Wood Products ^c	Accounting period ^d	FM CAP ^e (Mt CO ₂ eq.)	Forest Management Reference Level (FMRL) ^f (Mt CO ₂ eq./yr)
Australia	20	2.0	0.20	X	X	X		X	Annually/CP	117	4.700
Austria	30	2.0	0.050					X	CP	22	-6.516
Belgium	20	5.0	0.50					X	CP	41	-2.499
Bulgaria	10	5.0	0.10					X	CP	32	-8.168
Croatia	10	2.0	0.10					X	CP	8.7	-6.289
Cyprus	10	5.0	0.30					X	CP	1.6	-0.157
Czechia	30	2.0	0.050					X	CP	56	-4.686
Denmark (KP)	10	5.0	0.50	X	X			X	Annually	20	0.409
Estonia	30	2.0	0.50					X	CP	11	-1.742
European Union (KP)	10-30	2.0-5.0	0.05-1.0	X	X	X	X	X	Annually/CP	1644	-306.706
Finland	10	5.0	0.50					X	CP	20	-20.466
France (KP)	10	5.0	0.50					X	CP	153	-67.410
Germany	10	5.0	0.10	X	X			X	CP	351	-22.418
Greece	25	2.0	0.30					X	CP	30	-1.830
Hungary	30	5.0	0.50					X	Annually	31	-1.000
Iceland	10	2.0	0.50			X		X	CP	1.0	0.154
Ireland	20	5.0	0.10	X	X			X	CP	16	-0.142
Italy	10	5.0	0.50	X	X			X	CP	146	-21.182
Japan	30	5.0	0.30	X	X	X		X			
Kazakhstan	10	2.0	0.050					X	CP		
Latvia	20	5.0	0.10					X	CP	7.4	-16.302
Liechtenstein	20	3.0	0.063					X	CP	0.064	0.1
Lithuania	30	5.0	0.10					X	CP	13	-4.552
Luxembourg	10	5.0	0.50					X	CP	3.6	-0.418
Malta	30	5.0	1.0					X	CP	0.55	-0.049
Monaco	10	5.0	0.50					X	CP	0.028	
Netherlands	20	5.0	0.50					X	CP	62	-1.464
New Zealand	30	5.0	1.0					X	CP	18	11.150
Norway	10	5.0	0.50	X	X			X	CP	15	-11.400
Poland	10	2.0	0.10					X	CP	162	-27.133
Portugal	10	5.0	1.0	X	X			X	CP	17	-6.830
Romania	10	5.0	0.25			X		X	CP	85	-15.444
Russian Federation	18	5.0	1.0					X			-
Slovakia	20	5.0	0.30					X	CP	21	0.358
Slovenia	30	2.0	0.25					X	CP	5.7	-3.171
Spain	20	3.0	1.0	X				X	CP	79	-23.100
Sweden	10	5.0	0.50					X	CP	20	-41.336
Switzerland	20	3.0	0.063					X	CP	15	0.220
Ukraine	30	5.0	0.10					X	CP	263	-48.700
United Kingdom of Great Britain and Northern Ireland (KP)	20	2.0	0.10	X	X		X	X	CP	225	-8.268

^a As either reported by a Party in its report to facilitate the calculation of the assigned amount for the second commitment period under the Kyoto Protocol, submitted in accordance with decisions 2/CMP.8, annex I, and 6/CMP.9, or subsequently reviewed under Article 8 of the Kyoto Protocol and recorded in the initial review report and the compilation and accounting database.

^b As reported by Party in accordance with paragraph 8(b) of the annex to decision 13/CMP.1 or paragraph 1(f) of Annex I to decision 2/CMP.8 and paragraph 21 of the annex to decision 2/CMP.7.

^c An "X" indicates if any activity under Article 3.4 was elected for reporting, in accordance with paragraph 8 of the annex to decision 2/CMP.7 and paragraph 1(g) of Annex I to decision 2/CMP.8.

^d Parties specified in their report to facilitate the calculation of the assigned amount for the second commitment period under the Kyoto Protocol whether they intend to account for activities under Article 3, paragraph 3 and 4, of the Kyoto Protocol 'annually' or over the second commitment period, in accordance to paragraph 1(h) of Annex I to decision 2/CMP.8.

^e In accordance with paragraph 13 of the annex to decision 2/CMP.7, for the second commitment period, additions to the assigned amount of a Party resulting from forest management under Article 3, paragraph 4, and from forest management project activities undertaken under Article 6, shall not exceed 3.5 per cent of the base year greenhouse gas emissions excluding land use, land-use change and forestry pursuant to Article 3, paragraphs 7 and 8, or any amendments thereto, times eight. The FM CAP was calculated on the basis of the base year or period emissions reported in the annual greenhouse gas inventory report due by 15 April 2015, as included in the information communicated as part of the report to facilitate the calculation of a Party's assigned amount for the second commitment period, and takes into account any corrections or adjustments made during the review process of that report under Article 8 of the Kyoto Protocol.

^f The forest management reference level as inscribed in the appendix to the annex to decision 2/CMP.7, as contained in the initial review report for the second commitment period under the Kyoto Protocol, when available, or reported by Party in the latest greenhouse gas inventory submission.

Table 6.2(d)

Activity coverage in the reporting of information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4^a

	Wetland drainage and rewetting												
	Change in carbon pool reported ^b						Greenhouse gas sources reported ^c						
	Above-ground biomass	Below-ground biomass	Litter	Deadwood	Soil		Fertilization ^e	Drained, rewetted and other soils ^f		Indirect N ₂ O emissions from managed soil ^g	Biomass burning ⁱ		
					Mineral	Organic ^d							
							N ₂ O	CH ₄ ^h	N ₂ O	N ₂ O	CO ₂ ^j	CH ₄	N ₂ O
Australia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Austria	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NR	NR	NR	NR		NR	NA	NA	NA	NA	NA	NA	NA
Czechia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Estonia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	NR, R	NR, R	NR, R	NR, R		NO, NR, R	NO	NO	NO	NO	NO	NO	NO
Finland	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Germany	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Ireland	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Italy	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Japan	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Kazakhstan	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Lithuania	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Malta	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Monaco	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Norway	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Poland	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Romania	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Switzerland	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	NR	NR	NR	NR		R	NE	R	R	NE	NE	NE	NE

^a As reported in Table NIR 1. "Summary Table - Activity coverage and other information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4.

^b Indicate R (reported), NR (not reported), IE (included elsewhere) or NO (not occurring), for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4, or instantaneous oxidation (IO) for carbon stock changes in harvest wood products (HWP). With the exception of HWP, if changes in a carbon pool are not reported, verifiable information in the national inventory report (NIR) must be provided that demonstrates that these unaccounted pools were not a net source of anthropogenic greenhouse gas emissions. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^c Indicate R (reported), NE (not estimated), IE (included elsewhere) or NO (not occurring) for greenhouse gas sources reported, for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^d Includes CO₂ emissions/removals from organic soils, including CQ emissions from dissolved organic carbon associated with drainage and rewetting. On-site CQ emissions/removals from drainage and rewetting from organic soils and off-site CO₂ emissions via water-borne carbon losses from organic soils should be reported here for wetland drainage and rewetting. These emissions could be reported for other activities as appropriate.

^e N₂O emissions from fertilization of each activity (afforestation/reforestation, deforestation, forest management, revegetation and wetland drainage and rewetting) should be reported here when these emissions are not reported under the agriculture sector.

^f CH₄ and N₂O emissions from drained and rewetted organic soils should be reported here, as appropriate, when emissions are not reported under the agriculture sector. For wetland drainage and rewetting only emissions from organic soils are included.

^g CH₄ emissions from drained soils and drainage ditches should be reported here, as appropriate.

^h N₂O emissions from nitrogen mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils under the appropriate activity (afforestation/reforestation, deforestation, forest management, cropland management, grazing land management and revegetation) should be reported here when these emissions are not reported under the agriculture sector.

ⁱ Emissions from burning of organic soils should also be included here, as appropriate.

^j If CO₂ emissions from biomass burning are not already included under changes in carbon stocks, they should be reported under biomass burning. Parties that include CO₂ emissions from biomass burning in their carbon stock change estimates should report IE (included elsewhere).

Table 6.2(a)

Activity coverage in the reporting of information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4

	Afforestation and reforestation													Deforestation															
	Change in carbon pool reported ^a						Greenhouse gas sources reported ^c							Change in carbon pool reported ^a						Greenhouse gas sources reported ^c									
	Above-ground biomass	Below-ground biomass	Litter	Deadwood	Soil		HWP ^b	Fertilization ^d	Drained, rewetted and other soils ^e	Nitrogen mineralization in mineral soils ^f	Indirect N ₂ O emissions from managed soil ^g	Biomass burning ^h			Above-ground biomass	Below-ground biomass	Litter	Deadwood	Soil		HWP ^b	Fertilization ^d	Drained, rewetted and other soils ^e	Nitrogen mineralization in mineral soils ^f	Indirect N ₂ O emissions from managed soil ^g	Biomass burning ^h			
					Mineral	Organic ⁱ						CO ₂ ^k	CH ₄	N ₂ O					Mineral	Organic ⁱ						CO ₂ ^k	CH ₄	N ₂ O	
							N ₂ O	CH ₄ ^k	N ₂ O	N ₂ O	N ₂ O	CO ₂ ^k	CH ₄	N ₂ O							N ₂ O	CH ₄ ^k	N ₂ O	N ₂ O	N ₂ O	CO ₂ ^k	CH ₄	N ₂ O	
Australia	R	R	R	R	R	R	R	IE	NO	R	IE	R	R	R	R	R	R	R	R	R	NR	IE	NO	NO	R	IE	R	R	R
Austria	R	R	R	R	R	R	NO	NO	NO	R	IE	NO	NO	NO	R	R	R	R	R	R	NO	IO	NO	NO	R	IE	NO	NO	NO
Belgium	R	R	R	R	R	NO	NO	NO	NO	R	NO	NO	NO	NO	R	R	R	R	R	R	NO	R	IE	NO	NO	R	NO	NO	NO
Bulgaria	R	IE	R	R	NO	R	NO	NO	NO	NO	NO	IE	R	R	R	IE	R	R	R	R	NO	R	NO	NO	NO	NO	NO	NO	NO
Croatia	R	R	R	R	R	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	R	R	R	NO	R	NO	NO	R	NO	NO	NO	NO
Cyprus	R	R	R	R	NR	NO	NO	NO	NO	NO	NO	NO	NO	NO	R	R	R	R	R	NO	R	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	R	R	R	R	R	R	NO	NO	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	R	R	NO	NO	R	NO	NO	NO	NO
Denmark (KP)	R	R	R	R	R	R	R	IE	R	R	NO	R	NO	NO	NO	R	R	R	R	R	R	R	R	R	R	IE	NO	NO	NO
Estonia	R	R	R	R	R	R	R	NO	R	R	NO	NO	IE	R	R	R	R	R	R	R	R	NE	NE	R	IE	NO	NO	NO	NO
European Union (KP)	NO, NR, R	NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	NO, NR, R	NO, NR, R	IE, NO, NR, R	IE, NO, R	NO, R	NO, R	NO, R	IE, NO, R	IE, NO, R	IE, NO, R	NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	IE, NO, NR, R	
France (KP)	R	R	R	R	R	R	NO	NO	NO	NO	R	NE	R	R	R	R	R	R	R	R	NO	IO	NO	NO	R	NE	R	R	R
Germany	R	R	R	R	R	R	IE	NO	NO, R	NO, R	R	IE	NO	IE, NO	R	R	R	R	R	R	NO	NO	NO	NO	R	R	NO	NO	NO
Greece	R	R	NR	NR	NR	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	R	R	R	NO	NO	NO	NO	R	NO	NO	NO	NO
Hungary	R	R	NR	NR	NR	NO	IE	NO	IE	NO	IE	NO	R	R	R	R	R	R	R	R	IE	NO	NO	R	R	IE	R	R	IE
Iceland	R	R	R	R	NO	R	NO	R	R	R	NO	NO	NO	NO	R	NO	NO	NO	NO	R	R	NO	R	NE	NO	NO	NO	NO	NO
Ireland	R	R	R	R	R	R	R	IE	R	R	NO	IE	R	R	R	R	R	R	R	R	IO	IE	R	R	IE	NO	NO	NO	NO
Italy	R	R	R	R	R	R	NO	R	NO	NO	NO	R	R	R	R	R	R	R	R	R	NO	R	NO	NO	NO	NO	NO	NO	NO
Japan	R	R	R	R	R	NO	NO	IE	NO	NO	NO	IE	R	R	R	R	R	R	R	R	NO	R	IO	IE	R	R	NO	NO	NO
Kazakhstan	R	IE	R	R	R	NR	NO	NO	NO	NO	NO	IE	IE	R	IE	IE	IE	IE	IE	R	NO	NR	NO	NO	NO	NO	NO	NO	NO
Latvia	R	R	R	R	NO	R	NO	NO	R	R	NO	NO	NO	NO	R	R	R	R	R	R	R	IE	R	R	R	R	NO	NO	NO
Liechtenstein	R	R	NR	NR	R	R	NO	NO	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	NO	IO	NO	NO	R	NO	NO	NO	NO
Lithuania	R	R	R	R	NO	R	IE	NO	R	R	NO	NO	R	R	R	R	R	R	R	R	NO	R	NO	NO	R	NO	NO	NO	NO
Luxembourg	R	R	R	R	R	NO	IO	NO	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	NO	IO	NO	NO	R	NO	NO	NO	NO
Malta	NR	NR	NR	NR	NR	NR	NR	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	R	R	NR	R	R	R	IE	NO	NE	R	R	NO	R	R	R	R	R	R	R	R	R	IO	IE	NE	IE	R	IE	R	R
New Zealand	R	R	R	R	R	R	R	IE	NE	NE	R	IE	IE	R	R	R	R	R	R	R	R	IE	NE	IE	R	IE	IE	R	R
Norway	R	R	R	R	R	R	R	NE	R	NE	R	R	IE	NO	R	NO	R	R	R	R	R	R	IE	NE	IE	R	NO	NO	NO
Poland	R	R	NR	NR	R	R	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	R	R	R	NO	NO	NO	R	NO	NO	NO	NO
Portugal	R	R	R	R	IE	R	NO	R	IE	NO	NO	R	IE	R	R	R	R	R	R	R	IE	R	NO	R	R	IE	R	R	R
Romania	R	R	R	R	NO	R	NR	R	IE	NO	NO	R	R	R	R	R	R	R	R	R	NO	R	IE	NO	R	R	R	R	R
Russian Federation	IE	IE	IE	IE	IE	IE	NO	NO	NO	NO	NO	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	NO	NO	NO
Slovakia	R	R	R	R	NO	NR	R	NO	NO	NO	NO	R	R	R	R	R	R	R	R	R	NO	NR	NO	NO	R	NO	NO	NO	NO
Slovenia	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	R	R	R	R	R	R	NO	IO	NO	NO	R	NO	NO	NO	NO
Spain	R	IE	NR	R	NR	R	NO	NR	NO	NO	NO	NE	R	IE	NE	IE	NO	R	NO	NR	NO	NR	NO	NE	R	IE	NE	NO	R
Sweden	R	R	R	R	R	R	R	NO	R	R	R	R	R	NO	NO	R	R	R	R	R	R	R	R	R	R	R	NO	NO	NO
Switzerland	R	R	R	R	R	NO	NO	NO	IE	R	NO	IE	R	R	R	R	R	R	R	R	R	R	R	R	R	R	NO	NO	NO
Ukraine	R	R	R	R	R	R	NO	IE	NO	NO	NO	R	R	R	R	R	R	R	R	R	R	IO	NO	NO	R	R	NO	NO	NO
United Kingdom of Great Britain and Northern Ireland (KP)	R	R	R	R	R	R	R	R	R	R	R	NE	R	R	R	R	R	R	R	R	IO	NO	R	R	R	NO	R	R	R

^a As reported in Table NIR 1. "Summary Table - Activity coverage and other information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4.

^b Indicate R (reported), NR (not reported), IE (included elsewhere) or NO (not occurring), for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4, or instantaneous oxidation (IO) for carbon stock changes in harvest wood products (HWP). With the exception of HWP, if changes in a carbon pool are not reported, verifiable information in the national inventory report (NIR) must be provided that demonstrates that these unaccounted pools were not a net source of anthropogenic greenhouse gas emissions. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^c Indicate R (reported), NE (not estimated), IE (included elsewhere) or NO (not occurring) for greenhouse gas sources reported, for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^d Includes CO₂ emissions/removals from organic soils, including CO₂ emissions from dissolved organic carbon associated with drainage and rewetting. On-site CO₂ emissions/removals from drainage and rewetting from organic soils and off-site CO₂ emissions via water-borne carbon losses from organic soils should be reported here for wetland drainage and rewetting. These emissions could be reported for other activities as appropriate.

^e HWP from lands reported under deforestation, which originated from the deforestation event at the time of the land-use change shall be accounted for on the basis of instantaneous oxidation (IO).

^f N₂O emissions from fertilization of each activity (afforestation/reforestation, deforestation, forest management, revegetation and wetland drainage and rewetting) should be reported here when these emissions are not reported under the agriculture sector.

^g CH₄ and N₂O emissions from drained and rewetted organic soils should be reported here, as appropriate, when emissions are not reported under the agriculture sector. For wetland drainage and rewetting only emissions from organic soils are included.

^h CH₄ emissions from drained soils and drainage ditches should be reported here, as appropriate.

ⁱ N₂O emissions from nitrogen mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils under the appropriate activity (afforestation/reforestation, deforestation, forest management, cropland management, grazing land management and revegetation) should be reported here when these emissions are not reported under the agriculture sector.

^j Emissions from burning of organic soils should also be included here, as appropriate.

^k If CO₂ emissions from biomass burning are not already included under changes in carbon stocks, they should be reported under biomass burning activities that include CO₂ emissions from biomass burning in their carbon stock change estimates should report IE (included elsewhere).

Table 6.2(b)

Activity coverage in the reporting of information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4^a

	Forest management													Cropland management													
	Change in carbon pool reported ^b							Greenhouse gas sources reported ^c						Change in carbon pool reported ^b							Greenhouse gas sources reported ^c						
	Above-ground biomass	Below-ground biomass	Litter	Deadwood	Soil		HWP ^e	Fertilization ^f	Drained, rewetted and other soils ^g	Nitrogen mineralization in mineral soils ^h	Indirect N ₂ O emissions from managed soil ⁱ	Biomass burning ^j			Above-ground biomass	Below-ground biomass	Litter	Deadwood	Soil		Drained, rewetted and other soils ^g	Nitrogen mineralization in mineral soils ^h	Biomass burning ^j				
					Mineral	Organic ^d						CO ₂ ^k	CH ₄	N ₂ O					Mineral	Organic ^d			CO ₂ ^k	CH ₄	N ₂ O		
							N ₂ O	CH ₄ ^k	N ₂ O	N ₂ O	N ₂ O	CO ₂ ^k	CH ₄	N ₂ O							CH ₄ ^k	N ₂ O	CO ₂ ^k	CH ₄	N ₂ O		
Australia	R	R		R	R	IE	R	IE	NA	NA	R	IE	R	R	R	R	R	R	R	R	R	NA	R	CO ₂ ^k	R	CH ₄	R
Austria	R	R		IE	R	R	NO	R	NO	NO	NO	NO	IE	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Belgium	R	R		NO	NR	NO	R	R	NO	NO	NO	R	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Bulgaria	R	IE	NA		R	NA	NO	R	NO	NO	NO	NO	NO	IE	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Croatia	R	R		NO	NO	NO	NO	R	NO	NO	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Cyprus	R	R		NO	R	R	NO	R	NO	NO	NO	NO	NO	NO	NR	NR	NR	NR	NR	NR	NR	NA	NA	NA	NA	NA	
Czechia	R	R		IE	R	NR	R	R	NO	NO	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Denmark (KP)	R	R		R	R	R	R	R	R	R	NO	R	NO	NO	NO	R	R	NO	NO	R	R	R	R	NO	NO	NO	
Estonia	R	R		R	R	R	R	R	NO	R	R	NO	NO	IE	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
European Union (KP)	NR, R	IE, NR, R	IE, NO, NR, R	IE, NO, NR, R	NO, NR, R	NO, NR, R	NR, R	IE, NO, R	NO, R	NO, R	NO, R	IE, NO, R	IE, NO, R	NO, R	NO, R	NR, R	IE, NR, R	IE, NO, NR, R	IE, NO, NR, R	NR, R	NO, R	NO, R	IE, NO, R	NO, R	IE, NO, R	IE, NO, R	
Finland	R	R		IE	IE	R	R	R	R	R	R	R	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
France (KP)	R	R		R	R	R	NO	R	NO	NO	NO	R	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Germany	R	R		R	R	R	R	R	NO	R	R	R	IE, NO	NO, R	NO, R	R	R	IE	R	R	R	R	R	R	NO	NO	
Greece	R	R		NR	NR	NR	NO	R	NO	NO	NO	NO	NO	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Hungary	R	R		NR	NR	NR	R	R	IE	NO	NO	NO	NO	IE	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Iceland	R	R		R	NR	R	R	R	NO	R	R	NE	NE	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Ireland	R	R		R	R	R	R	R	IE	R	R	NO	IE	R	R	R	IE	NO	NO	R	NO	NO	IE	NO	R	R	
Italy	R	R		R	R	NR	NR	R	NO	NO	NO	NO	NO	R	R	R	R	NO	NO	R	NO	R	NO	R	R	R	
Japan	R	R		R	R	R	NO	R	NO	NO	NO	R	IE	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Kazakhstan	R	IE		R	R	R	NR	NO	NO	NO	NO	NO	IE	R	R	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Latvia	R	R		R	R	NO	R	R	NO	R	R	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Liechtenstein	R	R		NR	NR	NR	NO	R	NO	NO	NO	NO	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Lithuania	R	R		R	R	NO	R	R	NO	R	R	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Luxembourg	R	R		R	R	R	NO	IO	NO	NO	NO	NO	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Malta	NR	NR		NR	NR	NR	NR	NR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Monaco	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Netherlands	R	R		NR	R	R	R	R	NO	NE	R	R	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
New Zealand	R	R		R	R	R	R	R	NO	NE	NE	R	IE	IE	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Norway	R	R		R	R	R	R	R	R	NE, R	NE, R	R	IE	NE, R	NE, R	NO, R	NO, R	NO	NO	R	NE, R	R	NO	NO	NO	NO	
Poland	R	R		NR	NR	R	R	R	NO	NO	NO	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Portugal	R	R		R	IE	R	NO	R	IE	NO	NO	R	IE	R	R	R	R	R	NO	R	NO	NO	R	R	R	R	
Romania	R	R		R	NO	R	NR	R	IE	NO	NO	R	R	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Russian Federation	IE	IE		IE	IE	IE	IE	IE	NO	IE	IE	NO	IE	IE	IE	IE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Slovakia	R	R		NO, NR	NO, NR	NO, NR	NO, NR	R	NO	NO	NO	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Slovenia	R	R		R	R	R	NO	R	NO	NO	NO	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Spain	R	IE		NR	NR	NR	NO	R	NO	NO	NO	NE	IE	R	R	R	IE	NR, R	NR	R	NO	NO	NE, R	NO, R	IE, NO, R	IE, NO, R	
Sweden	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Switzerland	R	R		R	R	R	R	R	NO	NO	R	NO	NA	IE	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Ukraine	R	R		NA	NA	R	R	R	NO	NO	R	NO	NO	R	R	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
United Kingdom of Great Britain and Northern Ireland (KP)	R	R		R	R	R	R	R	NO	R	R	R	NO	R	R	R	R	IE	NR	NR	R	R	R	R	NE, NO	R	

^a As reported in Table NIR 1. "Summary Table - Activity coverage and other information relating to activities under Article 3, paragraph 3, forest management under Article 3.4.^b Indicate R (reported), NR (not reported), IE (included elsewhere) or NO (not occurring), for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4, or instantaneous oxidation (IO) for carbon stock changes in harvest wood products (HWP). With the exception of HWP, if changes in a carbon pool are not reported, verifiable information in the national inventory report (NIR) must be provided that demonstrates that these unaccounted pools were not a net source of anthropogenic greenhouse gas emissions. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.^c Indicate R (reported), NE (not estimated), IE (included elsewhere) or NO (not occurring) for greenhouse gas sources reported, for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.^d Includes CO₂ emissions/removals from organic soils, including CQ emissions from dissolved organic carbon associated with drainage and rewetting. On-site CQ emissions/removals from drainage and rewetting from organic soils and off-site CQ emissions via water-borne carbon losses from organic soils should be reported here for wetland drainage and rewetting. These emissions could be reported for other activities as appropriate.^e HWP from lands reported under deforestation, which originated from the deforestation event at the time of the land-use change shall be accounted for on the basis of instantaneous oxidation (IO).^f N₂O emissions from fertilization of each activity (afforestation/reforestation, deforestation, forest management, revegetation and wetland drainage and rewetting) should be reported here when these emissions are not reported under the agriculture sector.^g CH₄ and N₂O emissions from drained and rewetted organic soils should be reported here, as appropriate, when emissions are not reported under the agriculture sector for wetland drainage and rewetting only emissions from organic soils are included.^h CH₄ emissions from drained soils and drainage ditches should be reported here, as appropriate.ⁱ N₂O emissions from nitrogen mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils under the appropriate activity (afforestation/reforestation, deforestation, forest management, cropland management, grazing land management and revegetation) should be reported here when these emissions are not reported under the agriculture sector.^j Emissions from burning of organic soils should also be included here, as appropriate.^k If CO₂ emissions from biomass burning are not already included under changes in carbon stocks, they should be reported under biomass burning activities that include CO₂ emissions from biomass burning in their carbon stock change estimates should report IE (included elsewhere).

Activity coverage in the reporting of information relating to activities under Article 3, paragraph 3, forest management under Article 3.4, and elected activities under Article 3.4^a

As reported in Table NIR 1. "Summary Table - Activity coverage and other information relating to activities under Article 3, forest management under Article 3.4, and elected activities under Article 3.4.

^a Indicate R (reported), NR (not reported), IE (included elsewhere) or NO (not occurring), for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4, or instantaneous oxidation (IO) for carbon stock changes in harvest wood products (HWP). With the exception of HWP, if changes in a carbon pool are not reported, verifiable information in the national inventory report (NIR) must be provided that demonstrates that these unaccounted pools were not a net source of anthropogenic greenhouse gas emissions. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^b Indicate R (reported), NE (not estimated), IE (included elsewhere) or NO (not occurring) for greenhouse gas sources reported, for each relevant activity under Article 3.3, forest management or any elected activity under Article 3.4. Indicate NA (not applicable) for each activity that is not elected under Article 3.4. Explanation about the use of notation keys should be provided in the NIR.

^c Includes CO₂ emissions/removals from organic soils, including CO₂ emissions from dissolved organic carbon associated with drainage and rewetting. On-site CO₂ emissions/removals from drainage and rewetting from organic soils and off-site CO₂ emissions via water-borne carbon losses from organic soils should be reported here for wetland drainage and rewetting. These emissions could be reported for other activities as appropriate.

^d CH₄ and N₂O emissions from drained and rewetted organic soils should be reported here, as appropriate, when emissions are not reported under the agriculture sector *r*. For wetland drainage and rewetting only emissions from organic soils are included.

^e CH₄ emissions from drained soils and drainage ditches should be reported here, as appropriate.

^f N₂O emissions from nitrogen mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils under the appropriate activity (afforestation/reforestation, deforestation, forest management, cropland management, grazing land management and revegetation) should be reported here when these emissions are not reported under the agriculture sector.

^g Emissions from burning of organic soils should also be included here, as appropriate.

^h If CO₂ emissions from biomass burning are not already included under changes in carbon stocks, they should be reported under biomass burning. Parties that include CO₂ emissions from biomass burning in their carbon stock change estimates should report IE (included elsewhere).

ⁱ N₂O emissions from fertilization of afforestation/reforestation, deforestation, forest management, revegetation and wetland drainage and rewetting should be reported here when these emissions are not reported under the agriculture sector.

Table 6.3(a)**Afforestation and reforestation - area and implied carbon stock change factors from the change in carbon stocks for 2019^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)										Area subject to natural disturbances		
	Total	Mineral Soils	Organic Soil ^b	CSC in above-ground biomass ^{c, d}			CSC in below-ground biomass ^{c, d}			Net CSC in litter ^c	Net CSC in dead wood ^c	Net CSC in soil ^c		Total	Mineral Soils	Organic Soil ^b
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^{c, f}			
														(kha)		
Australia	9 077	9 073	4.2	0.18	IE, NA	0.18	0.10	IE, NA	0.10	0.014	0.15	0.080	14.1	NA	NA	NA
Austria	247	247	NA, NO	1.4	-0.46	0.98	0.36	-0.099	0.27	0.74	0.016	0.43	NA, NO	NA	NA	NA
Belgium	25	25	NA, NO	1.0	0.000	1.00	0.20	-0.000	0.20	NA, NO	NA, NO	0.49	NA, NO	NA	NA	NA
Bulgaria	314	314	NO	2.9	-0.23	2.7	IE, NO	IE, NO	IE, NO	0.40	NA, NO	-0.61	NO	NO	NO	NO
Croatia	64	64	NA, NO	0.86	-0.003	0.86	0.38	-0.003	0.38	0.22	0.016	-0.24	NA, NO	NA	NA	NA
Cyprus	9.4	9.4	NO	0.57	-0.018	0.55	0.16	-0.005	0.16	0.25	NO	0.011	NO			
Czechia	67	67	NO	1.8	-0.69	1.1	0.40	-0.18	0.22	0.43	0.023	0.22	NO	NO	NO	NO
Denmark (KP)	109	98	11	1.0	-0.082	0.95	0.23	IE	0.23	0.41	0.015	0.18	-1.3			
Estonia	56	45	11	0.79	IE, NO	0.79	0.31	IE, NO	0.31	0.30	0.006	0.17	-0.34	NO	NO	NO
European Union (KP)	10 359	9 897	462	1.6	-0.57	1.1	0.40	-0.15	0.25	0.13	0.039	0.048	-1.0	NA, NO	NA, NO	NA, NO
Finland	205	119	87	1.6	-0.31	1.3	0.47	-0.12	0.35	IE, NA	IE, NA	0.10	-1.0	NA	NA	NA
France (KP)	2 338	2 338	IE, NO	1.4	-0.23	1.2	0.48	IE, NO	0.48	0.16	0.023	0.042	IE, NO	NO	NO	NO
Germany	316	292	24	1.2	-1.1	0.16	0.30	-0.37	-0.064	0.47	0.003	0.19	-2.6	NA	NA	NA
Greece	34	34	NA, NO	1.9	-1.1	0.82	0.37	-0.22	0.15	NA, NE	NA, NE	NA, NE	NA	NA	NA	NA
Hungary	176	176	NA, NO	1.4	-0.043	1.3	0.34	-0.001	0.34	NA, NE	0.073	NA, NE	NA, NO	NA	NA	NA
Iceland	49	45	3.5	1.2	IE, NA, NO	1.2	0.30	IE, NA, NO	0.30	0.14	NA, NO	0.41	-0.37	NO	NO	NO
Ireland	331	148	183	5.2	-3.3	1.9	1.8	-1.4	0.42	0.47	0.513	0.10	-0.75	NA	NA	NA
Italy	2 078	2 078	NO	2.1	-1.2	0.88	0.43	-0.26	0.18	0.014	0.008	0.11	NA, NO	NO	NO	NO
Japan	105	105	NA, NO	2.2	0.000	2.2	0.56	-0.000	0.56	0.15	0.578	0.089	NA, NO	NA	NA	NA
Kazakhstan	550	550	NO	0.91	NE, NO	0.91	IE, NO	NE, NO	IE, NE, NO	0.068	0.085	0.10	NO	NE, NO	NE	NO
Latvia	119	116	2.7	0.47	-0.072	0.39	0.12	-0.018	0.10	0.081	0.085	NA, NO	-0.52	NA	NA	NA
Liechtenstein	0.036	0.036	NO	1.8	-0.042	1.8	0.59	-0.014	0.57	NO	NO	0.33	NO	NO	NO	NO
Lithuania	55	47	7.4	1.4	-0.018	1.4	0.33	-0.058	0.27	0.085	NO	0.46	-0.74			
Luxembourg	9.1	9.1	NO	3.6	-0.035	3.6	0.72	IE, NO	0.72	0.22	0.074	0.29	NO	NO	NO	NO
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	47	42	5.5	3.4	-0.28	3.2	0.62	-0.17	0.45	NE, NO	0.098	0.011	-1.0	NO	NO	NO
New Zealand	739	737	2.0	6.3	-4.0	2.3	1.4	-0.91	0.45	-0.035	1.441	-0.22	-0.68			
Norway	98	90	7.1	0.74	-0.40	0.35	0.22	-0.059	0.16	1.1	0.67	0.20	-0.93	NA	NA	NA
Poland	793	744	50	0.79	-0.036	0.75	0.22	IE, NO	0.22	NA, NO	NA, NO	-0.09	-0.68	NO	NO	NO
Portugal	636	636	NO	2.1	-0.98	1.1	0.40	-0.30	0.10	0.039	IE, NO	0.17	NO	NO	NO	NO
Romania	33	33	IE, NO	2.9	IE, NO	2.9	IE, NO	IE, NO	IE, NO	0.043	IE, NO	1.1	IE, NO	NO	NO	NO
Russian Federation	IE, NO	IE, NO	NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	NO	NO	NO	NO
Slovakia	50	50	NA, NO	1.2	NA, NO	1.2	0.28	NA, NO	0.28	0.42	NA, NO	1.2	NA, NO	NA	NA	NA
Slovenia	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NO	NO	NO
Spain	1 263	1 263	NA, NO	0.85	IE, NA	0.85	IE, NA	IE, NA	IE, NA	0.055	0.022	0.22	NA, NO	NA	NA	NA
Sweden	339	321	18	0.65	IE, NO	0.65	0.22	IE, NO	0.22	0.21	0.028	-0.07	-2.31	NO	NO	NO
Switzerland	2.7	2.7	0.011	2.2	-1.3	0.88	0.74	-0.34	0.40	-0.024	0.015	0.68	-0.078			
Ukraine	312	312	NA, NO	0.51	-0.017	0.50	0.11	IE, NA	0.11	0.86	NA	0.74	NA, NO	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	599	539	60	1.9	-0.52	1.4	0.79	-0.33	0.46	0.073	0.15	-0.62	-1.3	NA	NA	NA

^a As both afforestation and reforestation under Article 3.3 are subject to the same provisions specified in the annex to decision 2/CMP.7, they can be reported together.

^b A Party should report on-site CO₂ emissions from drained organic soils here. A Party may also choose to include emissions and removals from rewetted and other organic soils, including off-site CO₂ emissions, here. A Party should provide detailed information on methodologies, emissions and removals from these subdivisions in the NIR.

^c Carbon stock changes (CSC). The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^d Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key included elsewhere (IE) should be filled in, in the other column.

^e The value reported here is an emission and not a carbon stock change.

^f CO₂ emissions from dissolved organic carbon from drained and CO₂ emissions/removals from rewetted organic soils may also be included here.

Table 6.3(b)**Deforestation - area and implied carbon stock change factors from the change in carbon stocks for 2019**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)										Area subject to natural disturbance		
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{a, b}			CSC in below-ground biomass ^{a, b}			Net CSC in litter ^a	Net CSC in dead wood ^a	Net CSC in soil ^a		Total	Mineral Soils	Organic Soil
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^{c, d}	(kha)		
Australia	10 845	10 843	2.1	0.20	-0.36	-0.16	0.093	-0.14	-0.045	-0.060	-0.082	-0.18	-2.0	NO	NO	NO
Austria	81	81	NA, NO	0.21	-0.82	-0.61	0.053	-0.20	-0.15	-0.48	0.001	-0.37	NA, NO	NA	NA	NA
Belgium	26	26	NA, NO	0.038	-3.5	-3.5	0.008	-0.68	-0.67	-0.19	-0.047	-1.1	NA, NO	NA	NA	NA
Bulgaria	6.2	6.2	NO	0.027	-6.9	-6.8	IE, NO	IE, NO	IE, NO	-1.1	-0.467	-2.1	NO	NO	NO	NO
Croatia	4.8	4.8	NA, NO	0.72	-0.29	0.43	NA, NO	-0.068	-0.068	-0.032	-1.8	-1.6	NA, NO	NA	NA	NA
Cyprus	0.39	0.39	NO	0.14		0.14	0.040		0.040	-0.16	NO	-0.12	NO			
Czechia	19	19	NO	NA, NO	-1.7	-1.7	NA, NO	-0.37	-0.37	-0.22	-0.066	-0.13	NA, NO	NO	NO	NO
Denmark (KP)	14	13	0.67	0.11	-2.9	-2.8	0.059	-0.57	-0.51	-0.57	-0.053	-0.39	-8.4	NO	NO	NO
Estonia	32	27	4.4	IE, NA	-1.5	-1.5	IE, NA	-0.35	-0.35	-0.59	-0.070	-1.0	-1.5	NA	NA	NA
European Union (KP)	3 602	3 398	204	0.059	-1.3	-1.2	0.022	-0.26	-0.24	-0.25	-0.039	-0.80	-3.8	NA, NO	NA, NO	NA, NO
Finland	459	352	107	0.030	-0.55	-0.52	0.012	-0.17	-0.15	IE, NA	-0.007	-0.28	-4.7	NA	NA	NA
France (KP)	1 118	1 118	IE, NO	NO	-1.5	-1.5	NO	-0.42	-0.42	-0.20	-0.029	-0.71	IE, NO	NO	NO	NO
Germany	135	123	12	0.43	-1.8	-1.3	0.16	-0.24	-0.07	-0.92	-0.097	-0.35	-5.1	NA	NA	NA
Greece	5.8	5.8	NO	NA, NO	-0.14	-0.14	NA, NO	-0.054	-0.054	-0.090	-0.009	-1.7	NA, NO	NO	NO	NO
Hungary	44	44	NO	IE, NO	-1.1	-1.1	IE, NO	-0.28	-0.28	-0.46	-0.14	-0.55	NO	NO	NO	NO
Iceland	0.065	0.053	0.012	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	-0.62	-7.9	NO	NO	NO
Ireland	21	12	8.9	0.001	-0.23	-0.23	0.003	-0.047	-0.044	-0.016	-0.012	-0.26	-0.96	NA	NA	NA
Italy	66	66	NO	NA, NO	-2.7	-2.7	NA, NO	-0.56	-0.56	-0.16	-0.082	-4.6	NA, NO	NO	NO	NO
Japan	328	327	0.55	0.042	-1.0	-0.99	0.017	-0.26	-0.25	-0.13	-0.31	0.000	-1.2	NA	NA	NA
Kazakhstan	93	93	NO	NO	-0.032	-0.032	NO	IE, NE	IE, NE, NO	IE, NE	IE, NE	NE	NO	NE, NO	NE	NO
Latvia	98	77	21	NA, NO	-0.29	-0.29	NA, NO	-0.15	-0.15	-0.36	-0.50	-0.21	-4.2	NO	NO	NO
Liechtenstein	0.25	0.25	NO	0.27	-2.6	-2.3	0.086	-0.84	-0.75	-0.56	-0.29	-0.91	NO	NO	NO	NO
Lithuania	5.4	4.7	0.73	IE	-9.3	-9.3	IE	-2.2	-2.2	-1.1	-0.49	-12	-25			
Luxembourg	6.0	6.0	NO	0.070	-0.70	-0.63	IE, NA, NO	-0.15	-0.15	-0.13	-0.043	-0.52	NA, NO	NO	NO	NO
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	81	74	7.4	0.85	-3.7	-2.8	0.318	-0.70	-0.38	-1.1	-0.076	0.086	-2.4	NO	NO	NO
New Zealand	203	202	0.88	0.092	-3.4	-3.3	0.100	-0.74	-0.64	-0.19	-0.22	0.51	-2.4	NA	NA	NA
Norway	172	160	12	0.20	-1.2	-1.0	0.033	-0.31	-0.28	-1.7	-0.90	-0.49	-7.9	NA	NA	NA
Poland	29	29	0.43	NO	-1.1	-1.1	NO	-0.26	-0.26	-0.30	-0.027	-1.9	-1.0	NO	NO	NO
Portugal	386	386	NO	0.061	-0.34	-0.28	0.032	-0.073	-0.041	-0.041	IE	-0.94	NO	NO	NO	NO
Romania	378	378	NA, NO	NA, NO	-1.7	-1.7	IE, NA	IE, NA	IE, NA	-0.15	IE, NA	-1.2	NA, NO	NA	NA	NA
Russian Federation	IE, NO	IE, NO	IE, NO	NO	IE, NO	IE, NO	NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	NO	NO	NO
Slovakia	9.0	9.0	NA, NO	NA, NO	-0.85	-0.85	NA, NO	-0.19	-0.19	-0.083	-0.049	-0.014	NA, NO	NA	NA	NA
Slovenia	27	27	NO	NA, NO	-0.81	-0.81	NA, NA	-0.12	-0.12	-0.11	-0.072	-1.1	NA	NO	NO	NO
Spain	128	128	NA, NO	IE, NA	-1.0	-1.0	IE, NA	IE, NA	IE, NA	-0.070	-0.027	-0.21	NA, NO	NA	NA	NA
Sweden	342	325	17	0.068	-1.2	-1.1	0.022	-0.40	-0.37	-0.40	0.002	-0.64	-2.1	NA	NA	NA
Switzerland	12	12	0.060	0.000	-2.1	-2.1	0.000	-0.63	-0.63	-0.49	-0.13	-0.97	-4.5			
Ukraine	50	50	NA, NO	NA	-0.35	-0.35	NA	-0.055	-0.055	-0.12	NA	-0.27	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	81	57	24	0.001	-2.6	-2.6	IE, NA	IE, NA	IE, NA	-0.87	IE, NA	-1.6	-0.95	NA	NA	NA

^a Carbon stock change (CSC). The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^b Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^c The value reported here is an emission and not a carbon stock change.

^d CO₂ emissions from dissolved organic carbon from drained and CO₂ emissions/removals from rewetted organic soils may also be included here.

Table 6.3(c)

Forest management - area and implied carbon stock change factors from the change in carbon stocks for 2019 ^a

	Area subject to the activity			Implied carbon stock change factor (t C/ha)										Area subject to newly established forest(CEF-ne)			Area subject to harvested and converted forest plantations (CEF-he)			Area subject to natural disturbances		
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b,c}			CSC in below-ground biomass ^{b,c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b		Total	Mineral Soils	Organic Soil	Total	Mineral Soils	Organic Soil	Total	Mineral Soils	Organic Soil
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^{d,e}	(kha)			(kha)			(kha)		
Australia	12 705	12 705	IE, NA	0.19	-0.16	0.034	0.046	IE, NA	0.046	-0.090	-0.18	0.21	IE, NA	NA	NA	NA	NA	NA	NA	IE, NA	IE	NA
Austria	3 805	3 805	NA, NO	1.9	-1.7	0.25	0.45	-0.42	0.029	IE, NA, NE, NO	0.060	-0.18	NA, NO	NA	NA	NA	NA	NA	NA	NO	NO	NO
Belgium	679	679	NA, NO	0.63	NA, NO	0.63	0.068	NA, NO	0.068	NA, NO	NA, NO	NA, NO	NA, NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	3 610	3 610	NO	0.46	IE, NO	0.46	IE, NO	IE, NO	IE, NO	NA, NO	0.039	NA, NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Croatia	2 320	2 320	NA, NO	1.4	-0.90	0.53	0.34	-0.21	0.125	NA, NE	NA, NE	NA, NE	NA, NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	143	143	NO	0.27	-0.034	0.23	0.074	-0.009	0.065	NO	0.003	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	2 608	2 590	19	2.6	-4.0	-1.34	0.57	-0.86	-0.290	IE, NO	0.012	NE, NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Denmark (KP)	531	505	26	0.44	-0.005	0.43	0.092	-0.001	0.091	0.45	0.068	NA, NO	-1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	2 394	1 831	564	0.10	IE, NA	0.10	0.024	IE, NA	0.024	NA	0.011	0.19	-0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	153 548	141 048	12 499	1.1	-0.67	0.40	0.24	-0.17	0.071	-0.017	0.028	0.087	-0.33	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO
Finland	21 617	15 749	5 868	1.4	-1.1	0.23	0.36	-0.34	0.026	IE, NA	IE, NA	0.14	-0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	20 625	20 625	IE	1.3	-0.99	0.35	0.38	-0.23	0.15	0.001	-0.021	0.001	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Germany	10 693	10 439	253	0.89	IE, NA	0.89	0.16	IE, NA	0.16	-0.013	0.095	0.41	-2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	1 248	1 248	NA, NO	0.42	-0.089	0.33	0.14	-0.025	0.12	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NO	NA	NA	NA	NA	NA	NA	NO	NO	NO
Hungary	1 896	1 889	6.5	0.38	IE, NA, NO	0.38	0.094	IE, NA	0.094	NA, NO	NA, NO	0.015	-2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	94	93	0.46	0.20	-0.006	0.19	0.050	IE, NA, NE	0.050	0.006	IE, NA, NO	0.015	-0.37	NO	NO	NO	NO	NO	NO	NO	NO	NO
Ireland	446	176	270	6.0	-5.0	1.0	1.8	-1.60	0.17	0.012	-0.203	-0.055	-0.45	NO	NO	NO	NO	NO	NO	NA	NA	NA
Italy	7 446	7 446	NA, NO	2.1	-1.2	0.89	0.43	-0.25	0.18	0.003	0.002	NA, NE, NO	NA, NO	NA	NA	NA	NA	NA	NA	NO	NO	NO
Japan	16 026	15 982	44	0.56	-0.011	0.55	0.14	-0.003	0.14	0.002	-0.033	0.029	NA, NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kazakhstan	15 461	15 461	NO	0.094	NE, NO	0.094	IE, NA, NO	NE, NO	NA, NE, NO	0.090	0.011	0.034	NO	IE, NO	IE	NO	IE, NO	IE	NO	NE, NO	NE	NO
Latvia	3 125	2 743	382	2.4	-2.1	0.31	0.60	-0.52	0.077	0.002	0.040	NA, NO	-0.52	NO	NO	NO	NO	NO	NO	NA	NA	NA
Liechtenstein	6.2	6.2	NO	1.7	-1.7	-0.025	0.55	-0.55	-0.008	-0.034	0.029	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	2 161	1 867	294	0.62	IE, NA, NO	0.62	0.15	IE, NA, NO	0.15	0.004	0.039	NA, NE, NO	-1.5	IE	IE	IE	IE	IE	IE	NA	NA	NA
Luxembourg	87	87	NO	2.5	-2.0	0.46	0.54	-0.44	0.10	0.000	0.115	0.000	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Malta	0.072	0.072	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	305	292	13	3.0	-2.2	0.85	0.15	NO	0.15	NO	0.056	NO	-0.92	NO	NO	NO	NO	NO	NO	NO	NO	NO
New Zealand	9 201	9 188	13	1.0	-0.72	0.31	0.22	-0.15	0.071	0.005	-0.026	0.000	-0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	12 028	11 318	709	0.86	-0.53	0.33	0.21	-0.14	0.075	0.10	0.021	0.003	-0.24	NA	NA	NA	NA	NA	NA	NA	NA	NA
Poland	8 646	8 308	338	0.32	IE, NA, NO	0.32	0.018	IE, NA, NO	0.018	NA, NO	NA, NO	0.10	-0.68	NO	NO	NO	NO	NO	NO	NA	NA	NA
Portugal	3 734	3 734	NO	1.6	-1.2	0.40	0.33	-0.16	0.16	-0.002	IE, NO	-0.006	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Romania	6 954	6 951	3	1.7	-0.7	1.1	IE, NA, NO	IE, NA, NO	IE, NA, NO	0.003	NA, NO	0.067	-0.68	NA	NA	NA	NA	NA	NA	NO	NO	NO
Russian Federation	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE, NA, NO	IE	IE	IE	IE	IE	IE	NA	NA	NA
Slovakia	1 977	1 977	NA, NO	2.0	-1.6	0.47	0.47	-0.31	0.161	NA, NO	NA, NO	NA, NO	NA, NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	1 148	1 147	1	IE, NA	-0.1	-0.067	IE, NA	-0.27	-0.27	NA, NO	0.184	NA, NO	NA, NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Spain	14 422	14 422	NA, NO	0.53	IE, NA, NO	0.53	IE, NA, NO	IE, NA, NO	IE, NA, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NO	NO	NO	NO	NO	NO	NO	NO	NA	NA
Sweden	27 865	23 809	4 056	0.24	IE, NO	0.24	0.0789	IE, NO	0.079	-0.10	0.072	0.15	-0.34	NO	NO	NO	NO	NO	NO	NO	NA	NA
Switzerland	1 263	1 259	4	2.2	-1.7	0.49	0.63	-0.53	0.10	-0.033	0.029	0.002	-0.078	NO	NO	NO	NO	NO	NO	NO	NO	NO
Ukraine	9 601	9 408	193	1.7	-0.3	1.4	IE, NA	IE, NA	IE, NA	NA	NA	NA	-0.68	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	2 969	2 563	406	3.2	-2.7	0.4	1.6	-1.5	0.13	0.027	0.31	0.46	0.3	NA	NA	NA	NA	NA	NA	NO	NO	NO

^a For forest management, information reported here refers to anthropogenic carbon stock change for the inventory year for all geographical locations that encompass land subject to forest management under Article 3.4. Newly established forest will reach at least the equivalent carbon stock that was contained in the harvested forest plantation at the time of harvest, and, if not, a debit would be generated under Article 3.4. Reporting is required by Parties which apply the provision to exclude emissions from natural disturbances in accordance with paragraphs 33 and 34 in the annex to decision 2/CMP.7.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

^e CO₂ emissions from dissolved organic carbon from drained and CO₂ emissions/removals from rewetted organic soils may also be included here.

Table 6.3(d)

Cropland management - area and implied carbon stock change factors from the change in carbon stocks for 2019^a

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	39 647	39 638	8.7	0.001	-0.002	-0.001	IE, NA	-0.001	-0.001	-0.000	-0.000	0.034	-9.2
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus													
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	2 859	2 746	113	0.015	-0.014	0.002	0.002	-0.007	-0.005	NO	NO	-0.003	-6.4
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	53 435	52 751	685	0.029	-0.021	0.008	0.012	-0.014	-0.001	0.000	IE, NA, NE, NO	-0.040	-8.1
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	IE
Germany	13 532	13 178	355	0.036	-0.043	-0.007	0.030	-0.029	0.001	IE, NO	IE, NO	-0.11	-8.6
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	740	740	NO	0.012	-0.015	-0.003	IE	IE	IE	NO	NO	0.042	NO
Italy	9 000	8 979	21	0.034	-0.050	-0.016	0.024	-0.031	-0.007	NE	NE	0.20	-10
Japan	3 947	3 803	144	0.003	-0.019	-0.016	IE	-0.005	-0.005	NA	NA	-0.26	-2.2
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA, NO	NA	NO	NA	NA	NA	NA	NA	NA	NO	NO	NA	NO
Malta	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	941	881	60	0.001	-0.004	-0.003	NO	-0.004	-0.004	NO	NO	0.001	-7.9
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	2 344	2 344	NO	0.033	-0.018	0.015	0.010	-0.013	-0.003	-0.001	IE	-0.046	NO
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	20 186	20 186	NO	0.028	IE	0.028	IE	IE	IE	0.000	NO	0.019	NO
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland	4 774	4 578	196	0.017	-0.003	0.014	IE, NA	IE, NA	IE, NA	NA	NA	-0.61	-8.0

^a For those Parties where Cropland management has been elected, this table contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to cropland management under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(e)

Cropland management - area and implied carbon stock change factors from the change in carbon stocks for the base year^a

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	39 657	39 648	8.7	0.000	IE, NA	0.000	IE, NA	IE, NA	IE, NA	IE, NA	IE, NA	-0.17	-9.2
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria													
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus													
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	2 998	2 864	134	0.028	-0.034	-0.006	0.007	-0.008	-0.001	NO	NO	-0.082	-8.3
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	57 829	57 138	691	0.018	-0.021	-0.003	0.007	-0.010	-0.003	0.00	IE, NA, NE, NO	-0.10	-8.7
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Germany	13 749	13 410	339	0.008	-0.019	-0.011	0.006	-0.010	-0.004	IE, NO	IE, NO	-0.029	-9.1
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	740	740	NO	0.012	-0.036	-0.024	IE	IE	IE	NO	NO	0.015	NO
Italy	10 730	10 708	21	0.045	-0.076	-0.030	0.029	-0.040	-0.010	NE	NE	0.043	-10
Japan	4 591	4 442	150	0.000	-0.010	-0.009	0.000	-0.007	-0.007	NA	NA	-0.36	-2.3
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein													
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA, NO	NA	NO	NA	NA	NA	NA	NA	NA	NO	NO	NA	NO
Malta	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand													
Norway	940	882	58	0.001	-0.004	-0.003	NO	-0.004	-0.004	NO	NO	0.000	-7.9
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	2 974	2 974	NO	0.016	-0.004	0.012	0.003	-0.002	0.002	-0.005	IE	-0.29	NO
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	20 999	20 999	NO	0.007	IE	0.007	IE	IE	IE	0.000	NO	-0.004	NO
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine													
United Kingdom of Great Britain and Northern Ireland	5 640	5 442	198	0.025	-0.002	0.023	IE, NA	IE, NA	IE, NA	NA	NA	-0.82	-8.2

^a For those Parties where Cropland management has been elected, contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to cropland management under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(f)**Grazing land management - area and implied carbon stock change factors from the change in carbon stocks for 2019^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b,c}			CSC in below-ground biomass ^{b,c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	536 196	536 195	1.3	0.019	-0.016	0.003	0.000	IE, NA	0.000	-0.000	0.002	0.001	-5.0
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	183	104	79	0.10	-0.24	-0.14	0.27	-0.28	-0.003	NO	NO	0.13	-6.6
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	30 366	26 117	4 248	0.020	-0.049	-0.028	0.017	-0.016	0.001	0.000	IE, NA, NE, NO	0.23	-2.8
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	IE
Germany	7 200	6 178	1 022	0.076	-0.169	-0.093	0.061	-0.057	0.004	IE, NO	IE, NO	0.51	-7.0
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	4 223	3 888	335	NO	-0.001	-0.001	IE, NO	NO	IE, NO	NO	NO	0.14	-6.8
Italy	3 554	3 554	NO	NO	NO	NO	NO	NO	NO	NE	NE	0.049	NO
Japan	614	574	40	0.002	-0.010	-0.008	0.010	-0.042	-0.032	NA	NA	-0.43	-0.22
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA, NO	NA	NO	NA	NA	NA	NA	NA	NA	NO	NO	NA	NO
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	11 430	11 422	7.3	0.010	-0.004	0.006	0.004	-0.001	0.003	NO	NO	-0.002	-3.6
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	590	590	NO	0.032	-0.038	-0.006	0.025	-0.031	-0.006	0.001	IE	0.10	NO
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	14 616	11 803	2 813	0.002	-0.014	-0.011	IE, NA	IE, NA	IE, NA	NA	NA	0.18	-0.73

^a If grazing land management has been elected, report here information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to grazing land management under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(g)

Grazing land management - area and implied carbon stock change factors from the change in carbon stocks for the base year^a

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	545 115	545 113	1.3	0.005	-0.004	0.002	IE, NA	IE, NA	IE, NA	IE, NA	0.001	0.001	-5.0
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria													
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	147	66	82	0.016	-0.022	-0.006	0.043	-0.049	-0.007	NO	NO	-0.76	-6.8
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	29 215	24 913	4 303	0.013	-0.016	-0.003	0.003	-0.003	0.000	-0.000	IE, NA, NE, NO	0.092	-2.8
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Germany	6 267	5 284	983	0.012	-0.030	-0.017	0.010	-0.010	-0.000	IE, NO	IE, NO	0.10	-7.6
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	4 403	4 026	377	NO	-0.000	-0.000	IE, NO	IE, NO	IE, NO	NO	NO	-0.014	-4.7
Italy	3 826	3 826	NO	NO	NO	NO	NO	NO	NO	NE	NE	-0.008	NO
Japan	646	607	39	0.005	IE	0.005	0.018	IE	0.018	NA	NA	-0.21	-0.19
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein													
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA, NO	NA	NO	NA	NA	NA	NA	NA	NA	NO	NO	NA	NO
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand													
Norway	11 480	11 474	6.9	0.01	-0.004	0.006	0.004	-0.001	0.003	NO	NO	0.001	-3.6
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	529	529	NO	0.025	-0.063	-0.039	0.044	-0.033	0.011	-0.009	IE	-0.65	NO
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine													
United Kingdom of Great Britain and Northern Ireland	14 044	11 183	2 861	0.020	-0.016	0.003	IE, NA	IE, NA	IE, NA	NA	NA	0.20	-0.78

^a If grazing land management has been elected, report here information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to grazing land management under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(h)**Revegetation - area and implied carbon stock change factors from the change in carbon stocks for 2019^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	14 072	14 072	IE	0.019	-0.023	-0.003	IE	IE	IE	IE	IE	IE	IE
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	424	424	NA, NE, NO	0.82	IE, NA, NE, NO	0.82	IE, NA, NE, NO	IE, NA, NE, NO	IE, NA, NE, NO	0.001	NA, NE, NO	0.43	NA, NE, NO
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Germany	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	322	322	NO	0.057	IE	0.057	IE	IE	IE	IE	NO	0.51	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Italy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Japan	89	87	2.1	2.5	IE	2.5	0.65	IE	0.65	0.044	IE	0.95	NO
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Romania	102	102	NO	3.2	NO	3.2	IE	IE	IE	0.004	NO	0.17	NO
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

^a For those Parties where revegetation has been elected, contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to Revegetation under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(i)**Revegetation - area and implied carbon stock change factors from the change in carbon stocks for the base year^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	14 072	14 072	IE	0.001	-0.001	-0.000	IE	IE	IE	IE	IE	IE	IE
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria													
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	277	277	NA, NO	1.0	IE, NA, NO	1.0	IE, NA, NO	IE, NA, NO	IE, NA, NO	0.024	NA, NO	1.0	NA, NO
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Germany	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	186	186	NO	0.057	IE, NA	0.057	IE, NA	IE, NA	IE, NA	IE, NA	NA, NO	0.51	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Italy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Japan	5.9	5.8	0.14	2.2	IE	2.2	0.57	IE	0.57	0.043	IE	0.87	NO
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein													
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand													
Norway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Romania	88	88	NO	3.0	NO	3.0	IE	IE	IE	0.073	NO	2.2	NO
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine													
United Kingdom of Great Britain and Northern Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

^a For those Parties where revegetation has been elected, contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to Revegetation under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(i)**Wetland drainage and rewetting - area and implied carbon stock change factors from the change in carbon stocks for 2019^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	30	9.1	21	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	-3.4	-1.1
Finland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NO	NE
Germany	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Italy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Japan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland	30	9.1	21	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	-3.4	-1.1

^a For those Parties where revegetation has been elected, contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to Revegetation under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.3(k)**Wetland drainage and rewetting - area and implied carbon stock change factors from the change in carbon stocks for the base year^a**

	Area subject to the activity			Implied carbon stock change factor (t C/ha)									
	Total	Mineral Soils	Organic Soil	CSC in above-ground biomass ^{b, c}			CSC in below-ground biomass ^{b, c}			Net CSC in litter ^b	Net CSC in dead wood ^b	Net CSC in soil ^b	
	(kha)			Gains	Losses	Net change	Gains	Losses	Net change			Mineral	Organic ^d
Australia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria													
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	30	20	11	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	-3.4	-1.4
Finland													
France (KP)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Germany	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Italy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Japan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein													
Lithuania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand													
Norway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Romania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland													
Ukraine													
United Kingdom of Great Britain and Northern Ireland	30	20	11	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	-3.4	-1.4

^a For those Parties where revegetation has been elected, contains information on anthropogenic carbon stock change for the inventory year for all geographic locations that encompass land subject to Revegetation under Article 3.4.

^b The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

^c Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses. In that case, net gains should be reported in the "Gains" column and net losses should be reported in the "Losses" column. The notation key IE should be filled in, in the other column.

^d The value reported here is an emission or removal and not a carbon stock change.

Table 6.4**Direct and indirect N₂O emissions from N fertilization for 2019^{a, b}**

	Afforestation and Reforestation	Deforestation ^c	Forest management	Revegetation	Wetland drainage and rewetting ^d
	N ₂ O-N per unit of fertilizer	N ₂ O-N per unit of fertilizer	N ₂ O-N per unit of fertilizer	N ₂ O-N per unit of fertilizer	N ₂ O-N per unit of fertilizer
	kg N ₂ O-N/kg N	kg N ₂ O-N/kg N	kg N ₂ O-N/kg N	kg N ₂ O-N/kg N	kg N ₂ O-N/kg N
Australia	IE	IE	IE	IE	NA
Austria	NO	NO	NO	NA	NA
Belgium	NO	NO	NO	NA	NA
Bulgaria	NO	NO	NO	NA	NA
Croatia	NO	NO	NO	NA	NA
Cyprus				NO	NO
Czechia	NO	NO	NO	NA	NA
Denmark (KP)	IE	IE	IE	NA	NA
Estonia	NO	NO	NO	NA	NA
European Union (KP)	0.014	IE, NO	0.000	0.010	NA, NE, NO
Finland	NA	IE	0.010	NA	NA
France (KP)	NO	NO	NE	NE	NE
Germany	NO	NO	NO	NA	NA
Greece	NA	NA	NA	NA	NA
Hungary	IE	IE	IE	NA	NA
Iceland	IE	NA	NA	0.010	NA
Ireland	IE	IE	IE	NA	NA
Italy	NO	NO	NO	NA	NA
Japan	IE	IE	0.000	IE	NA
Kazakhstan	NO	NO	NO	NO	NO
Latvia	NO	IE	NO	NA	NA
Liechtenstein	NO	NO	NO	NO	NO
Lithuania	NO	NO	NO	NA	NA
Luxembourg	NO	NO	NO	NA	NA
Malta	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO
Netherlands	NO	IE	NO	NA	NA
New Zealand	IE	IE	IE	NA	
Norway	0.000	IE	0.000	NA	NA
Poland	NO	NO	NO	NA	NA
Portugal	IE	IE	IE	NA	NA
Romania	NO	NO	NO	NO	NO
Russian Federation	NO	NO	NO	NA	NA
Slovakia	NO	NO	NO	NA	NA
Slovenia	NO	NA	NA	NA	NA
Spain	NO	NO	NO	NA	NA
Sweden	NO	IE	0.000	NA	NA
Switzerland	NO	NA	NO	NA	NA
Ukraine	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	0.013	NO	NO	NA	NE

^a N₂O emissions from fertilization for cropland management, grazing land management and revegetation as well as from fertilization of areas categorized as cropland or grassland under deforestation should be reported in the agriculture sector. If a Party is not able to separate fertilizer applied to forest land from agriculture, it may report all N₂O emissions from fertilization in the agriculture sector. In this case, reporting of N₂O emissions from fertilization should not be included under afforestation/reforestation, deforestation or forest management, revegetation or wetland drainage and rewetting, as appropriate, to avoid double counting.

^b Direct and indirect N₂O emissions from fertilization are estimated following section 11.2 of the 2006 IPCC Guidelines based on the amount of fertilizer applied to land under forest management. The indirect N₂O emissions from afforestation and reforestation and land under forest management are estimated as part of the total indirect emissions in the agriculture sector based on the total amount of fertilizer used in the country. Parties should show that double counting of N₂O emissions from fertilization with agriculture sector estimates has been avoided.

^c Only for areas that have been subsequently reforested.

^d Only N₂O emissions which have not been reported under agriculture should be included here.

Table 6.5

CH₄ and N₂O emissions from drained and rewetted organic soils for 2019^{a, b, c}

	Afforestation and Reforestation			Deforestation			Forest Management			Cropland Management			Grazing Land Management			Revegetation			Wetland drainage and rewetting		
	Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor		Area of organic soils	Implied Emission Factor	
		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄		N ₂ O-N	CH ₄
	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha	kha	kg N ₂ O-N/ha	kg CH ₄ /ha
Australia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Czechia	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	11	1.4	4.0	0.42	629	59	26	2.9	4.0	117		33	89		83	NA	NA	NA	NA	NA	NA
Estonia	5.8	0.90	11	NA	NA	NA	284	2.0	9.3	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	377	1.6	6.3	125	4.8	49	7 058	1.4	8.4	666		32	2 148		54	NA, NE, NO	NA, NE, NO	NA, NE, NO	30	0.10	93
Finland	78	1.3	2.6	47	1.4	17	4 230	0.91	6.4	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Germany	24	2.7	4.8	12	0.96	131	253	2.8	4.9	355		16	1 022		44	NA	NA	NA	NA	NA	NA
Greece	NO	NA	NA	NO	NA	NA	NO	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	3.5	0.4	7.4	0.012	0.44	7.4	0.46	0.4	7.4	NA		NA	NA	NA	NA	NO	NA	NA	NA	NA	NA
Ireland	170	1.2	6.3	8.9	1.5	54	270	0.66	6.5	NO		NO	335		29	NA	NA	NA	NA	NA	NA
Italy	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NA	NA	NA	NA	NA	NA
Japan	NO	NO	NO	0.36	0.30	58.2	NO	NO	NO	18		58	2		68	NO	NO	NO	NA	NA	NA
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	2.7	2.8	67	16	13	36	417	2.6	33	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	3.8	1.8	7.9	NO	NO	NO	149	1.8	7.9	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NO	NO	NO	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	1.4	0.49	NE	NE	IE, NE	NE	3.06	0.49	NE	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Norway	7.1	3.2	7.4	12	IE, NE	58	241	2.3	8.9	60		58	7.3		63	NA	NA	NA	NA	NA	NA
Poland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NO	NA	NA	NA	NA	NA	NA	NA
Portugal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NA	NA	NA	NA	NA	NA
Romania	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NO	NA	NO	NO	NO	NA	NA	NA
Russian Federation	NO	NO	NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	IE, NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NO	NA	NA	NO	NA	NA	NO	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	18	2.3	9.0	18	IE, NO	3.7	1 024	2.1	8.1	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland	0.000	2.8	NE, NO	NO	NO	NO	0.12	2.8	NE	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	NO	NO	NO	NA	NA	NA	193	0.60	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	60	2.8	7.9	23	1.7	110	401	2.8	7.9	195		61	702		76	NA	NA	NA	30	0.10	93

^a Methodologies for CH₄ and N₂O emissions from drained and rewetted soils are given in the "Wetlands Supplement" for all land-use categories.^b N₂O emissions from drained cropland and grazing land soils are covered in the agriculture sector under cultivation of histosols.^c For activities other than wetland drainage and rewetting, a Party may choose to include CH₄ emissions from drained, rewetted and other organic soils. A Party should provide detailed information on methodologies, emissions and removals from these subdivisions in the NIR, ensuring consistency in reporting among categories.

Table 6.6

N₂O emissions from N mineralization/immobilization due to carbon loss/gain associated with land-use conversions and management change in mineral soils for 2019 ^a

	Afforestation and Reforestation			Deforestation ^c			Forest Management			Cropland Management			Grazing land Management			Revegetation		
	Land area ^b	Carbon Stock Change	IEF	Land area ^b	Carbon Stock Change	IEF	Land area ^b	Carbon Stock Change	IEF	Land area ^b	Carbon Stock Change	IEF	Land area ^b	Carbon Stock Change	IEF	Land area ^b	Carbon Stock Change	IEF
	kha	kt C	kg N ₂ O-N/ha	kha	kt C	kg N ₂ O-N/ha	kha	kt C	kg N ₂ O-N/ha	kha	kt C	kg N ₂ O-N/ha	kha	kt C	kg N ₂ O-N/ha	kha	kt C	kg N ₂ O-N/ha
Australia	9 073	728	0.025	10 843	-1 946	0.025	12 768	2 607	0.003	1 737	-193	0.013	536 147	488	0.001	NA	NA	NA
Austria	129	-66	0.47	34	-52	0.91	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium	19	-0.10	0.005	26	-30	0.66	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	198	-192	0.91	6.2	-13	1.4	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	62	-16	NO	4.5	-7.4	1.4	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus										NO	NO	NO	NO	NO	NO			
Czechia	NO	NO	NO	3.2	-0.41	0.09	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark (KP)	NO	NO	NO	13	2.4	0.1	505	NO	NO	2 746	20.4	0.003	104	7.2	0.044	NA	NA	NA
Estonia	45	7.5	NO	27	-28	0.70	1 831	345	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
European Union (KP)	3 137	-233	0.24	2 512	-739	2.0	50 234	8 276	0.001	18 503	-3 646	0.15	6 674	2 061	0.11	NA, NE, NO	NA, NE, NO	NA, NE, NO
Finland	119	0.44	0.003	352	100	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
France (KP)	NO	NO	NO	1 118	NA	0.52	NO	NO	NO	NE	NE	NE	NE	NE	NE	NE	NE	NE
Germany	292	56	0.11	123	-43	0.143	10 439	4 280	NO	13 178	-1 424	0.063	6 178	3 122	0.000	NA	NA	NA
Greece	NO	NA	NA	5.8	-10	1.1	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	179	12	0.001	36	-12	0.58	1 763	NE	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iceland	NO	NA	NA	NE	NE	NA	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ireland	148	IE	NE	7.0	-5.8	56	176	NO	NO	IE	IE	IE	IE	IE	IE	NA	NA	NA
Italy	NO	NO	NO	3.7	82	15	NO	NO	NO	NO	272	NO	NO	NO	NO	NO	NA	NA
Japan	NA	NA	NA	327	-4.7	0.016	15 982	-203	0.014	33	NA	0.38	544	NA	0.009	NA	NA	NA
Kazakhstan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Latvia	NO	NO	NO	57	-20	0.23	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liechtenstein	NO	NO	NO	0.25		0.61	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Lithuania	47	22	NO	4.7	-58	8.3	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	NO	NO	NO	6.0	-3.1	0.53	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA	NA	NO	NO	NO	NO	NO	NO
Monaco	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Netherlands	42	0.46	0.16	74	6.4	0.17	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	655	133	0.13	205	4.7	0.015	9 641	29	0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norway	90	18	0.041	160	-79	0.35	11 318	29	NO	876	0.55	0.011	11 419	-19	0.001	NA	NA	NA
Poland	793	NE	0.03	0.53	IE	6 188	8 650	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	15	-32	1.4	96	-373	2.6	19	-39	1.3	87	-243	1.9	51	-131	1.7	NA	NA	NA
Romania	6.6	0.12	0.97	36	0	0.53	NO	NO	NO	NA	NA	NA	NA	NA	NA	NO	NO	NO
Russian Federation	NO	NO	NO	IE	IE	IE	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovenia	NO	NA	NA	21	-53	2.1	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Spain	97	-2.8	0.30	75	-2.1	0.29	NE	NE	NE	356	-13	0.37	NA	NA	NA	NA	NA	NA
Sweden	321	-22	0.042	325	-218	0.30	23 809	3 690	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland	1.1	0.010	0.007	8.3	11	0.91	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	312	232	NA	50	-14	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)	625	IE, NO	0.45	57	IE	1.3	3 042	IE, NO	0.013	2 136	-2 258	0.71	341	-938	1.9	NA	NA	NA

^a N₂O emissions from nitrogen mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils under afforestation/reforestation, deforestation, forest management, cropland management, grazing land management and revegetation should be reported here when these emissions/removals are not reported under the agriculture sector.

^b Land areas should include lands converted and/or lands where a management change has taken place and resulted in carbon loss. Gains could be reported, under tier 3 approaches, if sufficient scientific justification is provided.

^c N₂O emissions associated with deforestation followed by the establishment of cropland should be reported under deforestation even if cropland management is not elected under Article 3.4.

^d In the calculation of the implied emission factor, N₂O emissions are converted to N₂O-N by multiplying by 28/44.

Table 6.7(a)

Emissions from biomass burning 2019^a

Afforestation/reforestation				Deforestation				Total article 3.3				Forest management			
Activity data	Implied Emission Factor			Activity data	Implied Emission Factor			Activity data	Implied Emission Factor			Activity data	Implied Emission Factor		
Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O
	(t/activity data unit)				(t/activity data unit)				(t/activity data unit)				(t/activity data unit)		
Australia	-2.4	0.032	0.000		IE	0.12	0.002		-0.49	0.11	0.002		IE	0.21	0.002
Austria	NO	NO	NO		NO	NO	NO		NO	NO	NO				
Belgium	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO
Bulgaria	IE, NO	0.000	0.000		NO	NO	NO		IE, NO	0.000	0.000		IE, NO	0.000	0.000
Croatia					NO	NO	NO		NO	NO	NO				
Cyprus															
Czechia	IE, NO	IE, NO	IE, NO		NO	NO	NO		IE, NO	IE, NO	IE, NO		0.000	0.000	0.000
Denmark (KP)	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO
Estonia	IE, NA	0.002	0.000		NO	NO	NO		IE, NA, NO	0.002	0.000		IE, NO	0.087	0.001
European Union (KP)															
Finland	IE, NA	NA	NA		NA	IE, NA	IE, NA		IE, NA	IE, NA	IE, NA		IE	0.030	0.002
France (KP)															
Germany	IE, NO	IE, NO	IE, NO		NO	NO	NO		IE, NO	IE, NO	IE, NO		IE, NO	0.20	0.011
Greece	19	0.24	0.002		NA	NA	NA		19	0.24	0.002		19	0.24	0.002
Hungary	IE	0.000	0.000		IE				IE	0.000	0.000		IE	0.000	0.000
Iceland	NA	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA	NA
Ireland	152	0.66	0.004		NO	NO	NO		152	0.66	0.004		261	1.1	0.007
Italy	IE, NO	0.39	0.012		NO	NO	NO		IE, NO	0.39	0.012		IE, NO	0.39	0.012
Japan	IE, NO	0.000	0.000		NO	NO	NO		IE, NO	0.000	0.000		IE, NO	0.000	0.000
Kazakhstan	IE, NO	IE, NO	IE, NO						IE, NO	IE, NO	IE, NO		IE, NO	57	3.3
Latvia	NO	NO	NO		NO	NO	NO		NO	NO	NO				
Liechtenstein	NO	NO	NO		NO	NO	NO		NO	NO	NO				
Lithuania	8.1	0.012	0.001		NO	NO	NO		8.1	0.012	0.001		17	0.11	0.006
Luxembourg	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO
Malta	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO
Monaco	NO	NO	NO		NO	NO	NO		NO	NO	NO		NO	NO	NO
Netherlands	96	0.29	0.016		2.9	0.004	0.000		11	0.028	0.002		96	0.29	0.016
New Zealand	IE	0.000	0.000		IE	0.000	0.000		IE	0.000	0.000		IE	0.000	0.000
Norway	IE, NO	0.018	0.001		NO	NO	NO		IE, NO	0.018	0.001		IE	0.018	0.001
Poland	IE, NO	0.25	0.014		NO	NO	NO		IE, NO	0.25	0.014		IE, NO	0.25	0.014
Portugal															
Romania	48	0.21	0.006		NO	NO	NO		48	0.21	0.006		30	0.13	0.004
Russian Federation					NO	NO	NO		NO	NO	NO		IE	IE	IE
Slovakia	IE, NO	0.12	0.007		NO	NO	NO		IE, NO	0.12	0.007				
Slovenia	NA	NA	NA						NA	NA	NA				
Spain	15	0.067	0.005		10	0.024	0.002		15	0.066	0.005		IE	0.066	0.005
Sweden	NO	NO	NO	Area burned	NO	NO	NO	Area burned	NO	NO	NO		IE	0.067	0.000
Switzerland	IE	IE	IE						IE	IE	IE				
Ukraine	0.002	0.000	0.000		NA, NO	NA, NO	NA, NO		0.002	0.000	0.000		0.002	0.000	0.000
United Kingdom of Great Britain and Northern Ireland (KP)	0.001	0.000	0.000		0.002	0.000	0.000		0.002	0.000	0.000		0.001	0.000	0.000

^a Total for controlled burning and wildfires.

^b For each activity, activity data could area burned or fuel burned. Units will be ha for area burned, and kg dm for fuel burned. The implied emission factor will refer to the selected activity data with an automatic change in the units.

^c Area burned (ab) and biomass burned (bb).

Table 6.7(b)**Emissions from biomass burning on cropland management land^a**

	Base year				2019			
	Activity data	Implied Emission Factor			Activity data	Implied Emission Factor		
	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O
		(t/activity data unit)				(t/activity data unit)		
Australia		IE	IE	IE		IE, NO	IE, NO	IE, NO
Austria		NA	NA	NA		NA	NA	NA
Belgium		NA	NA	NA		NA	NA	NA
Bulgaria						NA	NA	NA
Croatia		NA	NA	NA		NA	NA	NA
Cyprus		NO	NO	NO		NO	NO	NO
Czechia		NA	NA	NA		NA	NA	NA
Denmark (KP)		NO	NO	NO		NO	NO	NO
Estonia		NA	NA	NA		NA	NA	NA
European Union (KP)								
Finland		NA	NA	NA		NA	NA	NA
France (KP)								
Germany		NO	NO	NO		NO	NO	NO
Greece		NA	NA	NA		NA	NA	NA
Hungary		NA	NA	NA		NA	NA	NA
Iceland		NA	NA	NA		NA	NA	NA
Ireland		NO	0.011	0.000		NO	0.011	0.000
Italy		4.3	0.024	0.001		13	0.070	0.002
Japan		IE, NO	0.000	0.000		IE, NO	0.000	0.000
Kazakhstan		NO	NO	NO		NO	NO	NO
Latvia		NA	NA	NA		NA	NA	NA
Liechtenstein						NO	NO	NO
Lithuania		NA	NA	NA		NA	NA	NA
Luxembourg		NA	NA	NA		NA	NA	NA
Malta		NA	NA	NA		NA	NA	NA
Monaco		NO	NO	NO		NO	NO	NO
Netherlands		NA	NA	NA		NA	NA	NA
New Zealand						NA	NA	NA
Norway		NO	NO	NO		NO	NO	NO
Poland		NA	NA	NA		NA	NA	NA
Portugal								
Romania						NA	NA	NA
Russian Federation		NA	NA	NA		NA	NA	NA
Slovakia		NA	NA	NA		NA	NA	NA
Slovenia		NA	NA	NA		NA	NA	NA
Spain		0.08	0.02	0.002		0.14	0.025	0.002
Sweden		NA	NA	NA		NA	NA	NA
Switzerland								
Ukraine						NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)		NE, NO	NA	NA		NE, NO	NA	NA

^a Total for controlled burning and wildfires.^b For each activity, activity data should be selected between area burned or fuel burned. Units will be ha for area burned, and kg dm for fuel burned. The implied emission factor will refer to the selected activity data with an automatic change in the units.^c Area burned (ab) and biomass burned (bb).

Table 6.7(c)**Emissions from biomass burning on grazing land management land^a**

	Base year				2019			
	Activity data	Implied Emission Factor			Activity data	Implied Emission Factor		
	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O
		(t/activity data unit)				(t/activity data unit)		
Australia		IE	0.010	0.000		IE, NO	0.012	0.000
Austria		NA	NA	NA		NA	NA	NA
Belgium		NA	NA	NA		NA	NA	NA
Bulgaria						NA	NA	NA
Croatia		NA	NA	NA		NA	NA	NA
Cyprus		NO	NO	NO		NO	NO	NO
Czechia		NA	NA	NA		NA	NA	NA
Denmark (KP)		IE	1.7	0.15		IE	1.7	0.15
Estonia		NA	NA	NA		NA	NA	NA
European Union (KP)								
Finland		NA	NA	NA		NA	NA	NA
France (KP)								
Germany		NO	NO	NO		NO	NO	NO
Greece		NA	NA	NA		NA	NA	NA
Hungary		NA	NA	NA		NA	NA	NA
Iceland		NA, NO	NA	NA		NA, NO	NA	NA
Ireland		42	0.25	0.006		39	0.23	0.006
Italy		NO	NO	NO		NO	NO	NO
Japan		NO	NO	NO		NO	NO	NO
Kazakhstan		NO	NO	NO		NO	NO	NO
Latvia		NA	NA	NA		NA	NA	NA
Liechtenstein						NO	NO	NO
Lithuania		NA	NA	NA		NA	NA	NA
Luxembourg		NA	NA	NA		NA	NA	NA
Malta		NO	NO	NO		NO	NO	NO
Monaco		NO	NO	NO		NO	NO	NO
Netherlands		NA	NA	NA		NA	NA	NA
New Zealand								
Norway		IE, NO	NE, NO	NE, NO		IE, NO	NE, NO	NE, NO
Poland		NA	NA	NA		NA	NA	NA
Portugal								
Romania						NA	NA	NA
Russian Federation		NA	NA	NA		NA	NA	NA
Slovakia		NA	NA	NA		NA	NA	NA
Slovenia		NA	NA	NA		NA	NA	NA
Spain		NA	NA	NA		NA	NA	NA
Sweden	Area burned	NA	NA	NA	Area burned	NA	NA	NA
Switzerland								
Ukraine						NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)		NE, NO	NA	NA		NE, NO	NA	NA

^a Total for controlled burning and wildfires. Greenhouse gas emissions from prescribed savanna burning are reported in the agriculture sector.

^b For each activity, activity data should be selected between area burned or fuel burned. Units will be ha for area burned, and kg dm for fuel burned. The implied emission factor will refer to the selected activity data with an automatic change in the units.

^c Area burned (ab) and biomass burned (bb).

Table 6.7(d)

Emissions from biomass burning on revegetation land^a

	Base year				2019			
	Activity data	Implied Emission Factor			Activity data	Implied Emission Factor		
	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O
		(t/activity data unit)				(t/activity data unit)		
Australia		IE	IE	IE		IE	IE	IE
Austria		NA	NA	NA		NA	NA	NA
Belgium		NA	NA	NA		NA	NA	NA
Bulgaria						NA	NA	NA
Croatia		NA	NA	NA		NA	NA	NA
Cyprus		NO	NO	NO		NO	NO	NO
Czechia		NA	NA	NA		NA	NA	NA
Denmark (KP)								
Estonia		NA	NA	NA		NA	NA	NA
European Union (KP)								
Finland		NA	NA	NA		NA	NA	NA
France (KP)								
Germany		NA	NA	NA		NA	NA	NA
Greece		NA	NA	NA		NA	NA	NA
Hungary		NA	NA	NA		NA	NA	NA
Iceland		NE	NE	NE		NO	NO	NO
Ireland		NA	NA	NA		NA	NA	NA
Italy		NA	NA	NA		NA	NA	NA
Japan		NO	NO	NO		NO	NO	NO
Kazakhstan		NO	NO	NO		NO	NO	NO
Latvia		NA	NA	NA		NA	NA	NA
Liechtenstein						NO	NO	NO
Lithuania		NA	NA	NA		NA	NA	NA
Luxembourg		NA	NA	NA		NA	NA	NA
Malta		NO	NO	NO		NO	NO	NO
Monaco		NO	NO	NO		NO	NO	NO
Netherlands		NA	NA	NA		NA	NA	NA
New Zealand						NA	NA	NA
Norway		NA	NA	NA		NA	NA	NA
Poland		NA	NA	NA		NA	NA	NA
Portugal								
Romania		NO	NO	NO		NO	NO	NO
Russian Federation		NA	NA	NA		NA	NA	NA
Slovakia		NA	NA	NA		NA	NA	NA
Slovenia		NA	NA	NA		NA	NA	NA
Spain		NA	NA	NA		NA	NA	NA
Sweden	Area burned	NA	NA	NA	Area burned	NA	NA	NA
Switzerland								
Ukraine						NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)		NA	NA	NA		NA	NA	NA

^a Total for controlled burning and wildfires.

^b For each activity, activity data should be selected between area burned or fuel burned. Units will be ha for area burned, and kg dm for fuel burned. The implied emission factor will refer to the selected activity data with an automatic change in the units.

^c Area burned (ab) and biomass burned (bb).

Table 6.7(e)**Emissions from biomass burning on wetland drainage and rewetting land^a**

	Base year				2019			
	Activity data	Implied Emission Factor			Activity data	Implied Emission Factor		
	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O	Description of unit area ^b : ab or bb ^c	CO ₂	CH ₄	N ₂ O
		(t/activity data unit)				(t/activity data unit)		
Australia		NA	NA	NA		NA	NA	NA
Austria		NA	NA	NA		NA	NA	NA
Belgium		NA	NA	NA		NA	NA	NA
Bulgaria						NA	NA	NA
Croatia		NA	NA	NA		NA	NA	NA
Cyprus		NO	NO	NO		NO	NO	NO
Czechia		NA	NA	NA		NA	NA	NA
Denmark (KP)								
Estonia		NA	NA	NA		NA	NA	NA
European Union (KP)								
Finland		NA	NA	NA		NA	NA	NA
France (KP)								
Germany		NA	NA	NA		NA	NA	NA
Greece		NA	NA	NA		NA	NA	NA
Hungary		NA	NA	NA		NA	NA	NA
Iceland		NA	NA	NA		NA	NA	NA
Ireland		NA	NA	NA		NA	NA	NA
Italy		NA	NA	NA		NA	NA	NA
Japan		NA	NA	NA		NA	NA	NA
Kazakhstan		NO	NO	NO		NO	NO	NO
Latvia		NA	NA	NA		NA	NA	NA
Liechtenstein						NO	NO	NO
Lithuania		NA	NA	NA		NA	NA	NA
Luxembourg		NA	NA	NA		NA	NA	NA
Malta		NO	NO	NO		NO	NO	NO
Monaco		NO	NO	NO		NO	NO	NO
Netherlands		NA	NA	NA		NA	NA	NA
New Zealand						NA	NA	NA
Norway		NA	NA	NA		NA	NA	NA
Poland		NA	NA	NA		NA	NA	NA
Portugal								
Romania		NO	NO	NO		NO	NO	NO
Russian Federation		NA	NA	NA		NA	NA	NA
Slovakia		NA	NA	NA		NA	NA	NA
Slovenia		NA	NA	NA		NA	NA	NA
Spain		NA	NA	NA		NA	NA	NA
Sweden		NA	NA	NA		NA	NA	NA
Switzerland								
Ukraine						NA	NA	NA
United Kingdom of Great Britain and Northern Ireland (KP)						NE	NE	NE

^a Total for controlled burning and wildfires.^b For each activity, activity data should be selected between area burned or fuel burned. Units will be ha for area burned, and kg dm for fuel burned. The implied emission factor will refer to the selected activity data with an automatic change in the units.^c Area burned (ab) and biomass burned (bb).