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Subsidiary Body for Implementation

National greenhouse gas inventory data for the period 1990–2018

Report by the secretariat

Summary

All 43 Parties included in Annex I to the Convention (Annex I Parties) submitted their greenhouse gas (GHG) inventory common reporting format tables and national inventory reports in 2020, including 41 by the deadline of 15 April 2020. In 1990–2018, total aggregate GHG emissions without emissions and removals from land use, land-use change and forestry (LULUCF) for all Annex I Parties decreased by 12.7 per cent, while total GHG emissions and removals with LULUCF decreased by 17.1 per cent. For Annex I Parties with economies in transition, GHG emissions without and with LULUCF decreased by 38.7 and 48.3 per cent, respectively. For Annex I Parties that do not have economies in transition, GHG emissions without and with LULUCF decreased by 1.5 and 3.1 per cent, respectively. The information in this document is based on information in the national GHG inventory submissions of Annex I Parties received as at 17 October 2020.

GE.20-15174(E)

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Abbreviations and acronyms

Annex I Party	Party included in Annex I to the Convention
C	confidential
CH_4	methane
COP	Conference of the Parties
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
EIT Party	Party with economy in transition
F-gas	fluorinated gas
GHG	greenhouse gas
IE	included elsewhere
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
non-EIT Party	Party that does not have an economy in transition
N_2O	nitrous oxide
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"

I. Introduction

A. Mandate

1. COP 19 requested Annex I Parties to submit national inventory data on GHG emissions by sources and removals by sinks by 15 April of each year.[1] COP 20 requested the secretariat to compile and summarize information on the GHG inventory data submitted by Annex I Parties, inter alia, for consideration by the COP and the subsidiary bodies.[2]

B. Scope

2. This document shows the status of reporting of GHG inventories by Annex I Parties in 2020 (see chap. II below) and provides a summary of the latest available data on GHG emissions and removals for 1990–2018 (see chap. III below). Data are provided for CO_2, CH_4 and N_2O, as well as for F-gases,[3] and, where Parties have elected to report them, indirect CO_2 emissions from the atmospheric oxidation of CH_4, carbon monoxide and non-methane volatile organic compounds. Data are provided on total[4] aggregate[5] GHG emissions, both without and with net GHG emissions and removals from LULUCF.

3. The information provided in this document is based on information in the national GHG inventories[6] received from all 43 Annex I Parties (see table 1) as at 17 October 2020.

C. Possible action by the Subsidiary Body for Implementation

4. The Subsidiary Body for Implementation may wish to take note of the information contained in this document and to seek further guidance from the COP, as appropriate.

II. Status of reporting

A. Timeliness and completeness of submissions

5. According to the UNFCCC Annex I inventory reporting guidelines,[7] Annex I Parties are required to submit annually NIRs and CRF tables containing data for the base year up to two years prior to the year of submission. In 2020, all 43 Annex I Parties provided GHG data for 1990[8]–2018.

6. By 15 April 2020, CRF tables and NIRs from 41 Parties had been received. Within six weeks of that date, all 43 Parties had submitted their CRF tables and NIRs. After the initial submissions, 7 Parties submitted revised versions of their CRF tables and 10 Parties resubmitted their NIRs. The dates of the initial submissions of the CRF tables are shown in table 1.

[1] Decision 24/CP.19, para. 3.
[2] Decision 13/CP.20, paras. 8 and 10.
[3] Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, an unspecified mix of hydrofluorocarbons and perfluorocarbons, and nitrogen trifluoride taken together.
[4] The term "total" implies that emissions from the CRF sectors are summed; the inclusion of emissions from LULUCF in the sum is indicated separately; unless stated otherwise, totals do not include indirect CO_2 emissions.
[5] The term "aggregate" implies that GHG emissions and removals are calculated as a weighted sum of CO_2, CH_4, N_2O and F-gases using the global warming potential values agreed under the Convention.
[6] https://unfccc.int/ghg-inventories-annex-i-parties/2020.
[7] Decision 24/CP.19, annex I.
[8] Unless otherwise specified, for certain Parties base-year data are used instead of 1990 data. The Parties that may use a base year other than 1990, as stipulated in decisions 9/CP.2 and 11/CP.4, are Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

Table 1
Greenhouse gas inventory submissions from Annex I Parties in 2020

Party	*CRF tables submission date*[a]	*Party*	*CRF tables submission date*[a]
Australia	*27 May 2020*	Liechtenstein	15 April 2020
Austria	15 April 2020	Lithuania	15 April 2020
Belarus	15 April 2020	Luxembourg	15 April 2020
Belgium	14 April 2020	Malta	8 April 2020
Bulgaria	15 April 2020	Monaco	15 April 2020
Canada	14 April 2020	Netherlands	15 April 2020
Croatia	10 April 2020	New Zealand	15 April 2020
Cyprus	15 April 2020	Norway	3 April 2020
Czechia	14 April 2020	Poland	15 April 2020
Denmark	15 April 2020	Portugal	3 April 2020
Estonia	13 April 2020	Romania	14 April 2020
European Union	15 April 2020	Russian Federation	15 April 2020
Finland	9 April 2020	Slovakia	14 April 2020
France	15 April 2020	Slovenia	13 April 2020
Germany	18 March 2020	Spain	6 April 2020
Greece	14 April 2020	Sweden	14 April 2020
Hungary	15 April 2020	Switzerland	14 April 2020
Iceland	15 April 2020	Turkey	13 April 2020
Ireland	15 April 2020	Ukraine	*25 May 2020*
Italy	12 April 2020	United Kingdom	15 April 2020
Japan	14 April 2020	United States	14 April 2020
Latvia	14 April 2020		

[a] Dates after 15 April 2020 are shown in italics. The dates of submission of NIRs may be different.

B. Recalculations

7. According to the UNFCCC Annex I inventory reporting guidelines, Parties should, where necessary, conduct recalculations in order to improve the quality of their emission estimates and ensure the consistency of the time series.

8. In 2020, all 43 Annex I Parties reported recalculations that had an impact on their GHG emissions for 1990 (see table 2). The recalculations resulted from changes in activity data, emission factors and methodologies. For total aggregate GHG emissions without LULUCF, the impact of the change was less than 1 per cent for 36 Parties and more than 3 per cent for 3 Parties. For total aggregate GHG emissions with LULUCF, the impact of the change was less than 1 per cent for 33 Parties and more than 3 per cent for 2 Parties.

Table 2
Impact of inventory recalculations conducted by Annex I Parties in 2020

Party	*Impact on GHG emissions for 1990 without LULUCF (%)*	*Impact on GHG emissions for 1990 with LULUCF (%)*
Australia	1.11	2.11
Austria	–0.23	–0.27
Belarus	–1.08	–0.82
Belgium	–0.12	–0.07
Bulgaria	0.0002	–6.28
Canada	0.17	1.81
Croatia	0.05	0.99
Cyprus	0.38	0.99
Czechia	–0.10	–0.34
Denmark	0.69	2.65
Estonia	–0.38	–0.75
European Union	–0.03	–0.21
Finland	–0.10	–0.11
France	0.06	0.11
Germany	–0.12	0.08
Greece	0.20	0.21
Hungary	0.58	0.59
Iceland	3.32	0.43
Ireland	0.09	0.34
Italy	–0.33	–0.38
Japan	0.003	0.02
Latvia	0.11	–2.13
Liechtenstein	–0.26	–0.26
Lithuania	–0.47	–1.72
Luxembourg	–0.12	–0.30
Malta	22.21	22.22
Monaco	1.13	1.13
Netherlands	–0.02	–0.02
New Zealand	–3.16	2.28
Norway	0.49	0.31
Poland	0.19	–0.55
Portugal	–0.90	–0.90
Romania	–0.10	–0.10
Russian Federation	0.02	–0.12
Slovakia	0.21	0.28
Slovenia	–0.23	0.35
Spain	0.31	0.32
Sweden	–0.17	–0.57
Switzerland	0.99	2.12
Turkey	0.08	0.09
Ukraine	0.37	0.41
United Kingdom	–0.02	–0.03
United States	1.04	0.35

9. Table 3 presents a comparison of the estimates of total aggregate GHG emissions in 1990 contained in Annex I Parties' 2019 and 2020 GHG inventory submissions.

Table 3
Comparison of estimates reported in 2019 and 2020 of total aggregate greenhouse gas emissions of Annex I Parties in 1990

	Estimate reported in 2019	*Estimate reported in 2020*	*Explanation of the difference between the estimates reported in 2019 and 2020*
Total aggregate GHG emissions without LULUCF (Gt CO_2 eq)			
All Annex I Parties	19.17	19.25	Aggregate impact of inventory recalculations conducted by individual Annex I Parties
Annex I EIT Parties	5.81	5.82	Inventory recalculations (e.g. Hungary, Poland and Ukraine)
Annex I non-EIT Parties	13.36	13.43	Inventory recalculations (e.g. Australia, Canada and United States)
Total aggregate GHG emissions with LULUCF (Gt CO_2 eq)			
All Annex I Parties	17.94	17.98	Aggregate impact of inventory recalculations conducted by individual Annex I Parties
Annex I EIT Parties	5.57	5.56	Inventory recalculations (e.g. Bulgaria, Poland and Russian Federation)
Annex I non-EIT Parties	12.38	12.42	Inventory recalculations (e.g. Australia, Canada and United States)

III. Overview of emission trends and sources in Annex I Parties

A. Total aggregate greenhouse gas emissions

10. From 1990 to 2018, total aggregate GHG emissions without LULUCF for all Annex I Parties decreased by 12.7 per cent, from 19,245.19 to 16,794.39 Mt CO_2 eq. During the same period, total aggregate GHG emissions with LULUCF decreased by 17.1 per cent, from 17,978.83 to 14,913.26 Mt CO_2 eq. From 2000 to 2018, GHG emissions without and with LULUCF decreased by 6.4 and 7.3 per cent, respectively. Between 2017 and 2018, GHG emissions increased by 0.8 per cent without LULUCF and by 0.9 per cent with LULUCF.

11. Figures 1–2 show the trends in total aggregate GHG emissions from 1990 to 2018 for all Annex I Parties taken together, for Annex I EIT Parties and for Annex I non-EIT Parties.

12. For Annex I EIT Parties, GHG emissions decreased by 38.7 per cent without LULUCF and by 48.3 per cent with LULUCF from 1990 to 2018. From 2000 to 2018, GHG emissions without and with LULUCF increased by 5.8 and 7.0 per cent, respectively. Between 2017 and 2018, GHG emissions without and with LULUCF increased by 2.0 and 3.0 per cent, respectively.

13. For Annex I non-EIT Parties, GHG emissions decreased by 1.5 per cent without LULUCF and by 3.1 per cent with LULUCF from 1990 to 2018. From 2000 to 2018, GHG emissions without and with LULUCF decreased by 9.2 and 10.2 per cent, respectively.

Figure 1
Greenhouse gas emissions of Annex I Parties

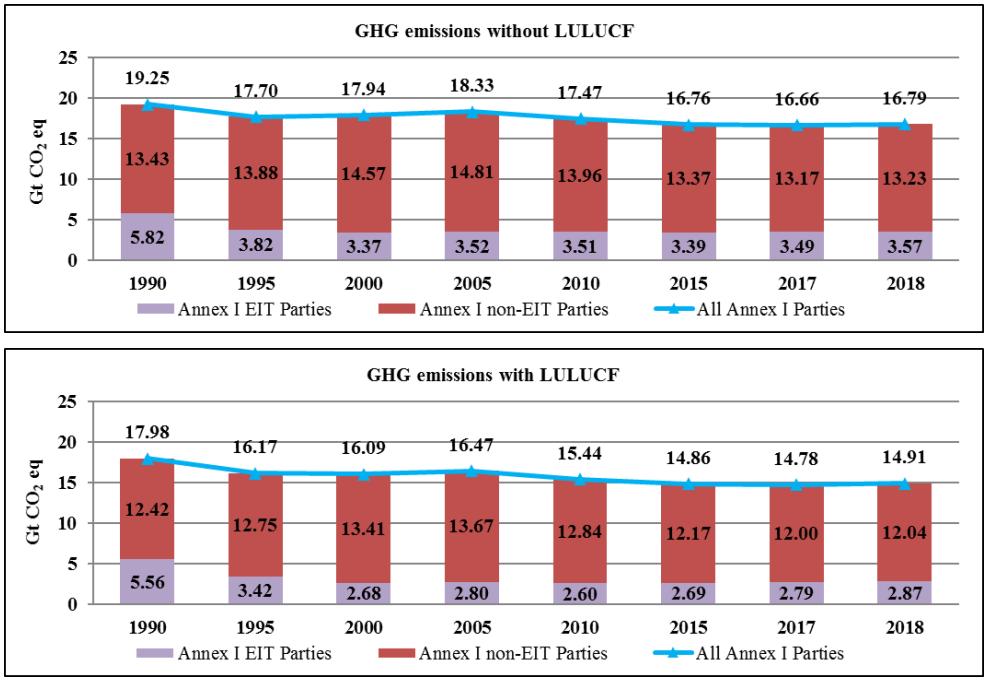
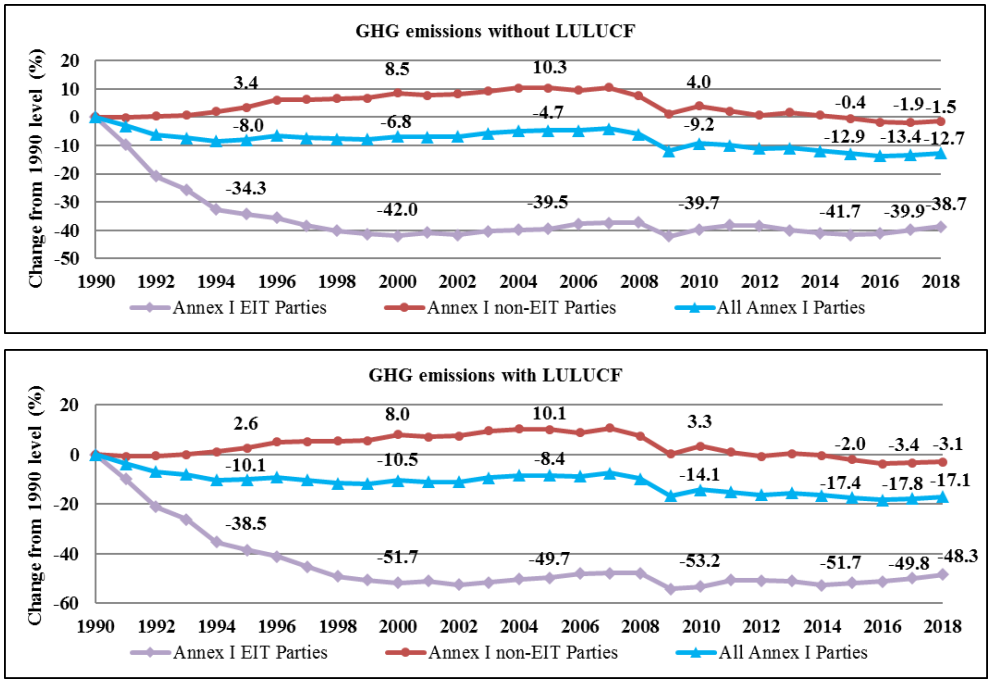


Figure 2
Changes in greenhouse gas emissions of Annex I Parties, 1990–2018

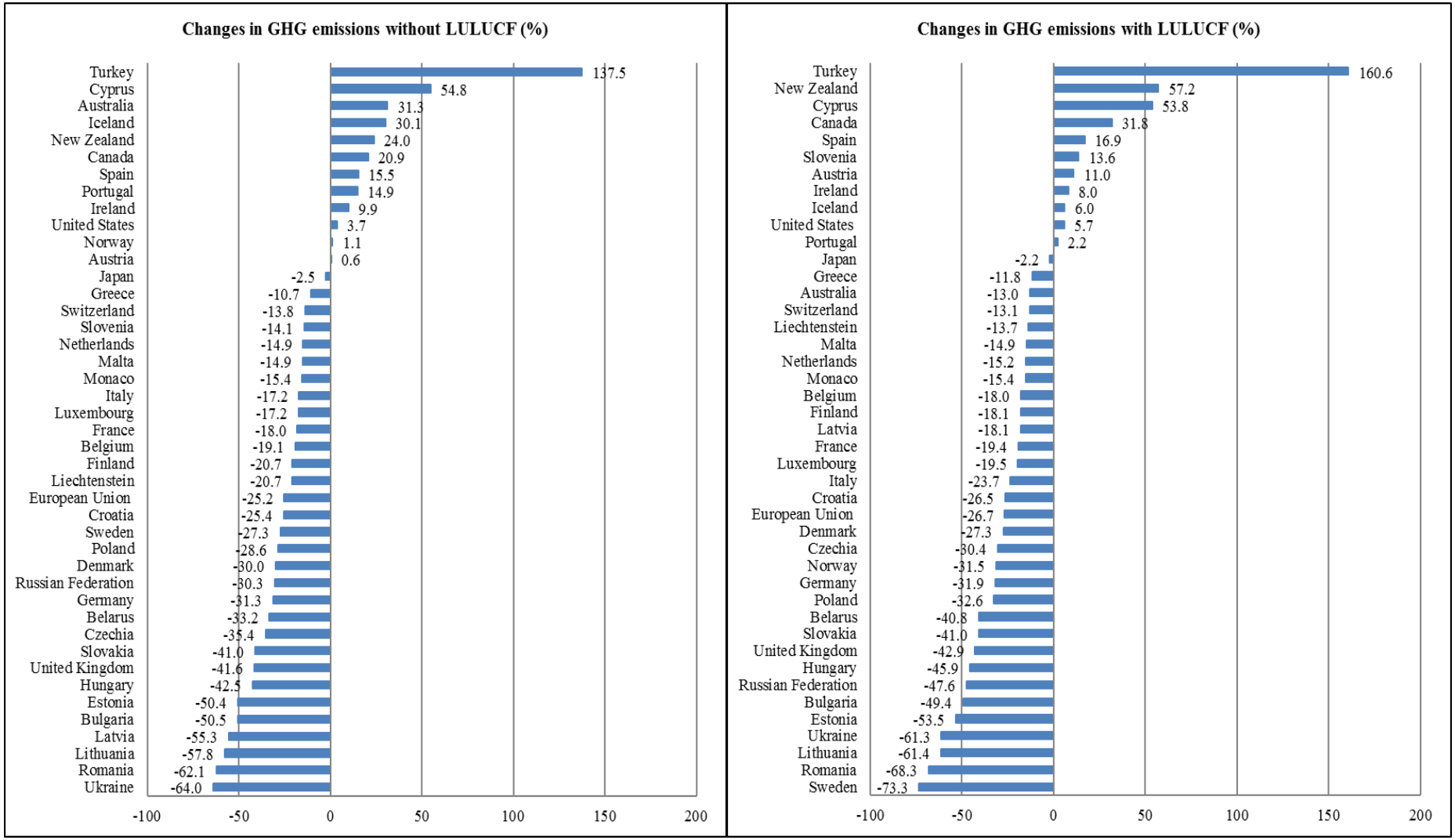


14. Between 2017 and 2018, GHG emissions showed an increase of 0.5 per cent without LULUCF and of 0.4 per cent with LULUCF.

15. The changes in total aggregate GHG emissions in 1990–2018 varied considerably among Parties (see figure 3). The largest decrease in emissions without LULUCF was in Ukraine (by 64.0 per cent), while the largest decrease in emissions with LULUCF was in Sweden (by 73.3 per cent). The greatest increases in emissions without and with LULUCF were in Turkey (by 137.5 and 160.6 per cent, respectively).

Figure 3

Changes in total aggregate emissions of individual Annex I Parties, 1990–2018

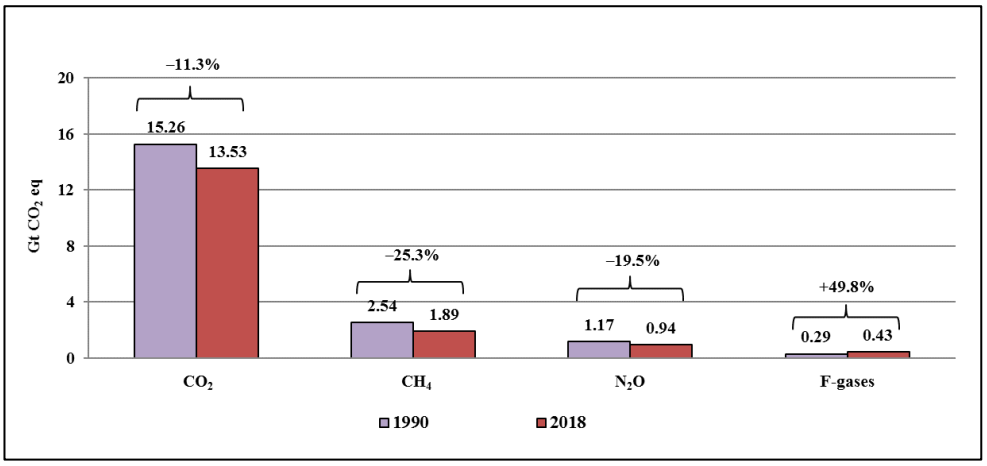


B. Greenhouse gas emissions by gas

16. Throughout 1990–2018, CO_2 accounted for the largest share of total emissions, contributing 79.3 per cent in 1990 and 80.6 per cent in 2018. CH_4 was the second-highest contributor to total GHG emissions (13.2 per cent in 1990 and 11.3 per cent in 2018), followed by N_2O (6.1 per cent in 1990 and 5.6 per cent in 2018). F-gases contributed 1.5 per cent in 1990 and 2.6 per cent in 2018 to the total GHG emissions.

17. Figure 4 shows the contribution of each GHG to the total emissions without LULUCF for 1990 and 2018 and the changes in the total emissions of each GHG in 1990–2018. Emissions of CO_2, CH_4 and N_2O decreased, while emissions of F-gases increased by 49.8 per cent.

Figure 4
Greenhouse gas emissions without land use, land-use change and forestry of Annex I Parties by gas, 1990 and 2018



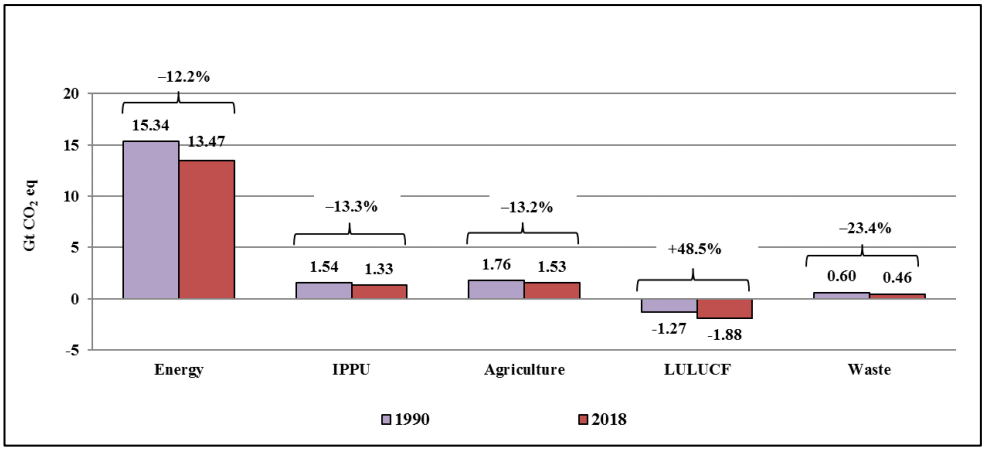
18. Between 2017 and 2018, emissions of CO_2, CH_4, N_2O and F-gases increased by 0.7, 0.9, 1.2 and 1.1 per cent, respectively.

C. Greenhouse gas emissions by sector

19. From 1990 to 2018, emissions from all sectors decreased (see figure 5). The waste sector experienced the largest relative decrease in emissions (by 23.4 per cent), followed by the IPPU, agriculture and energy sectors. Over the same period net GHG removals from LULUCF increased by 48.5 per cent, from –1,266.36 to –1,881.13 Mt CO_2 eq.

20. Between 2017 and 2018, emissions from the energy, IPPU, agriculture and waste sectors increased by 0.7, 1.4, 1.0 and 0.7 per cent, respectively. Net GHG removals from LULUCF increased by 0.1 per cent.

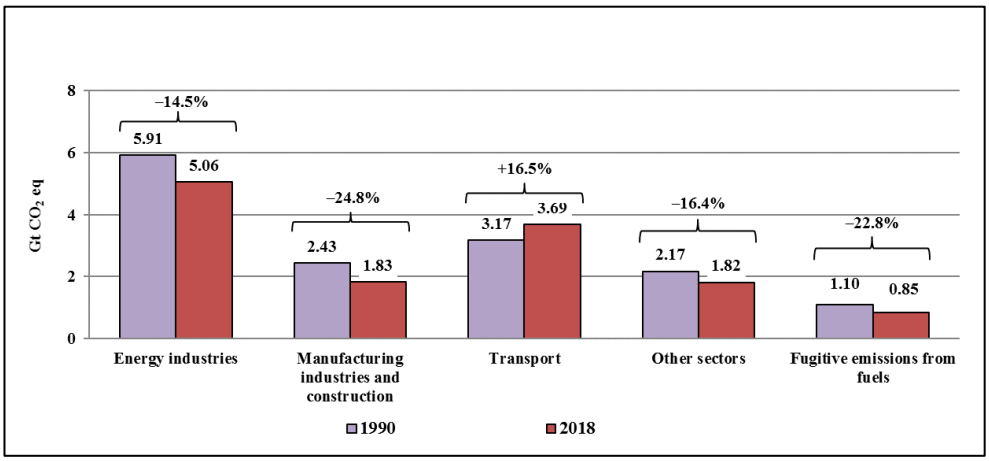
Figure 5
Greenhouse gas emissions and removals of Annex I Parties by sector, 1990 and 2018



Note: The sector other is not included in this figure because its contribution to total GHG emissions was very small. Emissions from that sector increased by 11.4 per cent between 1990 and 2018.

21. Within the energy sector, GHG emissions decreased in all subsectors except transport, where emissions increased by 16.5 per cent, from 1990 to 2018 (see figure 6). The largest relative emission reduction (by 24.8 per cent) occurred in manufacturing industries and construction.

Figure 6
Greenhouse gas emissions of Annex I Parties in the energy sector, 1990 and 2018

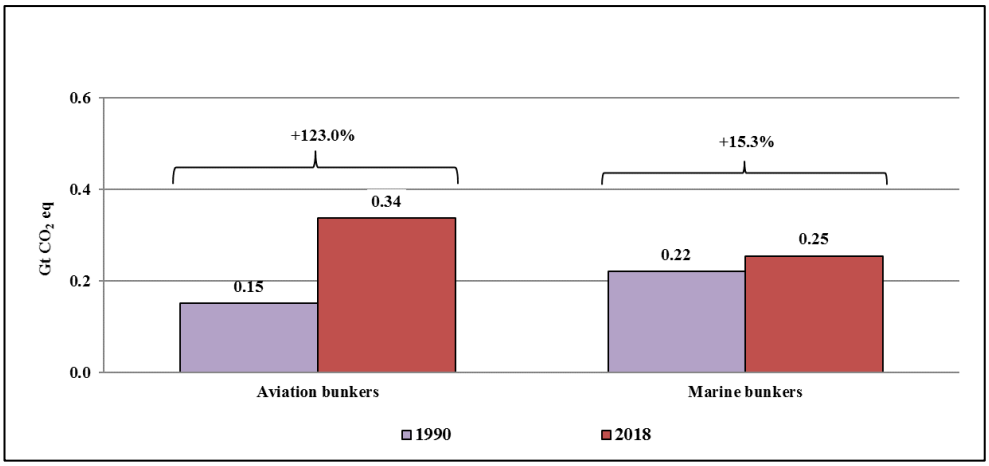


Note: The CO_2 transport and storage subsector is not included in this figure because its contribution to total GHG emissions was very small. Emissions from that subsector increased by 11,418.9 per cent between 1990 and 2018.

22. Between 2017 and 2018, emissions from energy industries decreased by 1.2 per cent, whereas emissions from manufacturing industries and construction, transport, other sectors and fugitive emissions increased by 0.6, 1.3, 3.7 and 3.9 per cent, respectively.

23. In 1990–2018, emissions from international bunkers increased by 123.0 per cent for aviation and by 15.3 per cent for navigation (see figure 7).

Figure 7
Greenhouse gas emissions from international bunker fuels for Annex I Parties, 1990 and 2018



24. Between 2017 and 2018, emissions from international bunkers increased by 4.6 per cent for aviation and by 1.7 per cent for navigation.

25. A comparison of the percentage changes in total aggregate GHG emissions from 1990 to the latest available year reported in Annex I Parties' 2019 and 2020 inventory submissions is presented in table 4, with explanations for the differences in the estimates.

Table 4
Comparison of the changes in the total aggregate greenhouse gas emissions of Annex I Parties reported in 2019 and 2020

	Estimate reported in 2019	*Estimate reported in 2020*	*Explanation of the difference between the estimates reported in 2019 and 2020*
Change in total aggregate GHG emissions without LULUCF from 1990 to the latest available year (%)			
All Annex I Parties	–13.24	–12.73	Combined impact of changes for individual Annex I Parties
Annex I EIT Parties	–39.95	–38.70	Increases in emissions between 2017 and 2018 and inventory recalculations (e.g. Poland, Romania and Ukraine)
Annex I non-EIT Parties	–1.62	–1.49	Increases in emissions between 2017and 2018 and inventory recalculations (e.g. Australia, Belgium and United States)
Change in total aggregate GHG emissions with LULUCF from 1990 to the latest available year (%)			
All Annex I Parties	–17.42	–17.05	Combined impact of changes for individual Annex I Parties
Annex I EIT Parties	–49.79	–48.32	Increases in emissions between 2017 and 2018 and inventory recalculations (e.g. Lithuania, Romania and Ukraine)
Annex I non-EIT Parties	–2.85	–3.06	Decreases in emissions between 2017 and 2018 and inventory recalculations (e.g. Germany, Italy and Japan)

D. Emission data for individual Annex I Parties

26. Tables 5–17 show detailed GHG data for individual Annex I Parties. Total aggregate GHG emissions without and with emissions and removals from LULUCF are provided in tables 5–6; emissions of CO_2, CH_4 and N_2O (without and with emissions and removals from LULUCF) are provided in tables 7–12; emissions of F-gases are provided in table 13; emissions and removals from LULUCF are provided in tables 14–16; and indirect CO_2 emissions are provided in table 17.

27. Blank cells in the tables denote that either data were not available or notation keys, such as "NA", "NE", "NO", "IE" or "C", were used to report emission data. Negative values denote removals; positive values denote emissions.

28. The changes in emissions from 1990 to 2018 were calculated using exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the tables.

Table 5

Total aggregate anthropogenic emissions of CO_2, CH_4, N_2O and F-gases without emissions and removals from land use, land-use change and forestry

	kt CO_2 eq					*Change 1990–2018*
Party	*1990*	*2000*	*2010*	*2017*	*2018*	*(%)*
Australia	424 998	489 374	540 571	556 612	558 047	31.3
Austria	78 493	80 262	84 613	82 023	78 950	0.6
Belarus[a]	137 766	79 589	92 278	91 113	91 993	–33.2
Belgium	146 411	149 705	134 316	118 005	118 456	–19.1
Bulgaria[a, b]	116 755	59 580	60 727	61 683	57 816	–50.5
Canada	603 222	730 682	690 531	713 838	729 349	20.9
Croatia[a]	31 876	25 709	28 034	25 032	23 793	–25.4
Cyprus	5 690	8 458	9 518	8 974	8 812	54.8
Czechia[a]	197 203	149 458	139 900	129 059	127 450	–35.4
Denmark	71 000	71 773	64 655	49 678	49 694	–30.0
Estonia[a]	40 277	17 247	21 019	20 923	19 974	–50.4
European Union[c]	5 647 955	5 167 526	4 796 604	4 323 067	4 224 358	–25.2
Finland	71 065	70 145	75 650	55 337	56 359	–20.7
France	551 405	556 690	516 994	470 593	452 210	–18.0
Germany	1 249 459	1 043 426	942 338	894 296	858 369	–31.3
Greece	103 309	126 493	118 522	95 586	92 222	–10.7
Hungary[a, b]	109 953	73 235	64 857	63 781	63 220	–42.5
Iceland	3 733	4 171	4 929	4 836	4 857	30.1
Ireland	55 468	68 314	61 278	61 005	60 935	9.9
Italy	516 052	552 474	513 756	431 324	427 529	–17.2
Japan	1 270 040	1 374 774	1 302 550	1 289 240	1 238 343	–2.5
Latvia[a]	26 289	10 562	12 310	11 248	11 745	–55.3
Liechtenstein	228	247	229	194	181	–20.7
Lithuania[a]	48 016	19 523	20 888	20 618	20 267	–57.8
Luxembourg	12 741	9 669	12 169	10 236	10 547	–17.2
Malta	2 570	2 790	2 984	2 156	2 186	–14.9
Monaco	103	109	88	86	87	–15.4
Netherlands	220 741	219 239	213 281	192 876	187 756	–14.9
New Zealand	63 591	74 103	77 268	79 641	78 862	24.0
Norway	51 459	55 115	55 469	52 387	52 022	1.1
Poland[a, b]	578 339	395 950	412 926	414 679	412 856	–28.6
Portugal	58 559	81 528	68 750	70 447	67 280	14.9
Romania[a, b]	306 392	143 154	124 173	116 875	116 115	–62.1
Russian Federation[a]	3 187 507	1 901 067	2 057 878	2 155 271	2 220 123	–30.3
Slovakia[a]	73 517	49 292	46 406	43 475	43 348	–41.0
Slovenia[a, b]	20 367	19 038	19 555	17 367	17 502	–14.1
Spain	289 383	388 776	358 859	340 298	334 255	15.5
Sweden	71 185	68 115	64 467	52 715	51 779	–27.3
Switzerland	53 779	53 081	54 727	47 873	46 333	–13.8
Turkey[d]	219 368	298 760	398 883	523 753	520 942	137.5
Ukraine[a]	942 072	427 203	406 799	322 779	339 244	–64.0
United Kingdom	797 812	716 280	614 493	475 260	465 932	–41.6
United States	6 437 000	7 275 397	6 981 613	6 488 235	6 676 650	3.7
Number of Parties showing a decrease in emissions of more than 1%:						*31*
Number of Parties showing a change in emissions within 1%:						*1*
Number of Parties showing an increase in emissions of more than 1%:						*11*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 6

Total aggregate anthropogenic emissions of CO_2, CH_4, N_2O and F-gases with emissions and removals from land use, land-use change and forestry

	kt CO_2 eq					*Change 1990–2018*
Party	*1990*	*2000*	*2010*	*2017*	*2018*	*(%)*
Australia	617 651	545 377	593 538	529 487	537 446	–13.0
Austria	66 504	63 871	78 836	77 171	73 798	11.0
Belarus[a]	117 201	47 037	52 913	78 036	69 361	–40.8
Belgium	143 173	147 950	133 614	116 983	117 441	–18.0
Bulgaria[a, b]	97 526	41 258	48 067	53 286	49 355	–49.4
Canada	543 595	698 890	665 287	697 424	716 489	31.8
Croatia[a]	25 454	18 758	21 108	20 542	18 699	–26.5
Cyprus	5 471	8 423	9 120	8 555	8 412	53.8
Czechia[a]	191 516	141 415	133 660	126 744	133 244	–30.4
Denmark	77 457	77 014	65 201	54 165	56 289	–27.3
Estonia[a]	38 651	14 042	17 280	19 089	17 984	–53.5
European Union[c]	5 393 050	4 853 554	4 461 845	4 061 390	3 951 394	–26.7
Finland	56 300	51 248	53 187	38 154	46 091	–18.1
France	529 806	539 836	480 111	444 279	426 828	–19.4
Germany	1 220 646	1 008 120	922 675	867 668	831 437	–31.9
Greece	101 201	124 552	115 479	92 377	89 244	–11.8
Hungary[a, b]	108 195	72 560	60 535	58 607	58 560	–45.9
Iceland	13 076	13 409	14 191	13 889	13 867	6.0
Ireland	60 389	73 779	66 810	66 343	65 232	8.0
Italy	512 496	531 570	471 782	409 964	391 263	–23.7
Japan	1 207 821	1 287 016	1 232 102	1 230 700	1 180 953	–2.2
Latvia[a]	16 080	658	12 068	9 927	13 163	–18.1
Liechtenstein	235	272	249	205	203	–13.7
Lithuania[a]	42 438	10 056	10 603	16 883	16 400	–61.4
Luxembourg	12 842	8 952	12 050	9 833	10 334	–19.5
Malta	2 574	2 794	2 987	2 160	2 190	–14.9
Monaco	103	109	88	86	87	–15.4
Netherlands	227 233	225 299	218 556	197 924	192 671	–15.2
New Zealand	35 294	45 990	49 360	56 931	55 468	57.2
Norway	41 367	30 573	29 009	29 365	28 355	–31.5
Poland[a, b]	558 483	358 884	378 412	377 809	376 405	–32.6
Portugal	59 707	75 846	57 548	80 280	60 993	2.2
Romania[a, b]	289 319	122 242	103 455	95 195	91 656	–68.3
Russian Federation[a]	3 109 544	1 420 149	1 334 729	1 564 095	1 629 550	–47.6
Slovakia[a]	63 841	39 431	40 258	36 891	37 678	–41.0
Slovenia[a, b]	15 619	14 977	13 430	17 192	17 745	13.6
Spain	253 435	349 186	321 583	301 362	296 159	16.9
Sweden	36 697	28 382	19 360	9 647	9 785	–73.3
Switzerland	51 844	58 939	52 297	46 551	45 041	–13.1
Turkey[d]	163 591	237 207	325 463	423 870	426 372	160.6
Ukraine[a]	882 881	381 715	375 573	312 530	341 889	–61.3
United Kingdom	797 945	712 394	605 642	465 472	455 964	–42.9
United States	5 583 630	6 463 810	6 241 086	5 724 291	5 903 153	5.7
Number of Parties showing a decrease in emissions of more than 1%:						*32*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*11*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 7
Total anthropogenic CO_2 emissions without emissions and removals from land use, land-use change and forestry

	kt CO_2 eq					*Change 1990–2018*
Party	*1990*	*2000*	*2010*	*2017*	*2018*	*(%)*
Australia	278 425	350 195	405 503	415 097	415 954	49.4
Austria	62 125	66 163	72 012	69 629	66 720	7.4
Belarus[a]	103 690	54 877	63 156	60 743	61 872	–40.3
Belgium	120 309	126 735	114 561	99 456	100 208	–16.7
Bulgaria[a, b]	89 607	45 305	47 863	47 505	43 552	–51.4
Canada	462 117	572 162	555 550	572 834	586 505	26.9
Croatia[a]	23 329	19 694	21 051	18 738	17 719	–24.0
Cyprus	4 657	7 146	8 089	7 516	7 333	57.5
Czechia[a]	164 204	127 066	117 501	105 642	104 411	–36.4
Denmark	54 846	55 610	50 678	36 213	36 246	–33.9
Estonia[a]	36 907	15 244	18 785	18 636	17 711	–52.0
European Union[c]	4 466 228	4 177 735	3 951 412	3 513 036	3 432 017	–23.2
Finland	56 972	57 038	64 099	44 673	45 849	–19.5
France	403 307	419 232	393 718	352 179	338 327	–16.1
Germany	1 052 349	899 780	832 670	786 655	755 362	–28.2
Greece	83 426	102 999	97 362	74 853	71 798	–13.9
Hungary[a, b]	85 685	58 608	52 124	49 685	49 628	–42.1
Iceland	2 248	2 946	3 660	3 615	3 675	63.5
Ireland	32 944	45 249	41 748	38 910	38 803	17.8
Italy	438 009	468 442	433 688	351 474	348 085	–20.5
Japan	1 158 391	1 264 844	1 214 069	1 187 661	1 135 688	–2.0
Latvia[a]	19 504	7 065	8 549	7 223	7 859	–59.7
Liechtenstein	199	217	191	156	144	–27.8
Lithuania[a]	35 772	11 874	13 927	13 546	13 669	–61.8
Luxembourg	11 848	8 732	11 219	9 250	9 569	–19.2
Malta	2 408	2 546	2 582	1 553	1 532	–36.4
Monaco	98	100	78	73	75	–23.9
Netherlands	162 385	171 887	182 118	164 445	160 170	–1.4
New Zealand	25 446	32 281	34 958	36 153	35 080	37.9
Norway	35 321	42 519	46 232	43 563	43 818	24.1
Poland[a, b]	471 771	317 338	334 607	337 340	337 706	–28.4
Portugal	45 083	65 527	52 989	54 720	51 482	14.2
Romania[a, b]	208 649	95 456	84 290	78 077	76 951	–63.1
Russian Federation[a]	2 525 294	1 471 052	1 612 885	1 646 180	1 691 360	–33.0
Slovakia[a]	61 633	41 289	38 523	36 087	36 088	–41.4
Slovenia[a, b]	16 669	15 445	16 376	14 265	14 488	–13.1
Spain	231 214	311 267	283 725	274 671	269 654	16.6
Sweden	57 349	54 684	53 042	42 307	41 766	–27.2
Switzerland	44 154	43 618	45 050	38 182	36 895	–16.4
Turkey[d]	151 508	229 791	314 380	425 329	419 195	176.7
Ukraine[a]	705 830	285 337	294 078	223 232	231 694	–67.2
United Kingdom	601 187	568 220	512 865	388 803	380 850	–36.7
United States	5 128 301	5 998 070	5 698 056	5 253 606	5 424 882	5.8
Number of Parties showing a decrease in emissions of more than 1%:						*31*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*12*

[a] EIT Party.
[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.
[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.
[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 8
Total anthropogenic CO_2 emissions with emissions and removals from land use, land-use change and forestry

	kt CO_2 eq					*Change 1990–2018*
Party	*1990*	*2000*	*2010*	*2017*	*2018*	*(%)*
Australia	448 318	383 109	436 759	366 765	376 135	–16.1
Austria	49 968	49 612	66 076	64 618	61 408	22.9
Belarus[a]	83 100	22 296	23 769	47 646	39 166	–52.9
Belgium	117 060	124 933	113 767	98 333	99 092	–15.3
Bulgaria[a, b]	70 136	26 516	34 836	38 595	34 591	–50.7
Canada	401 195	538 913	529 271	555 468	572 738	42.8
Croatia[a]	16 858	12 543	14 019	14 009	12 501	–25.8
Cyprus	4 438	7 101	7 689	7 096	6 933	56.2
Czechia[a]	158 433	118 949	111 161	103 298	110 164	–30.5
Denmark	61 019	60 555	50 915	40 366	42 498	–30.4
Estonia[a]	34 962	11 715	14 705	16 452	15 369	–56.0
European Union[c]	4 188 936	3 840 588	3 595 782	3 227 621	3 138 043	–25.1
Finland	38 541	34 644	38 552	24 704	32 792	–14.9
France	377 396	397 352	352 448	321 444	308 577	–18.2
Germany	1 021 884	862 863	810 983	757 786	726 048	–29.0
Greece	81 249	100 823	94 285	71 609	68 785	–15.3
Hungary[a, b]	83 882	57 844	47 744	44 442	44 917	–46.5
Iceland	7 871	8 481	9 267	9 025	9 086	15.4
Ireland	37 271	50 085	46 176	43 117	42 237	13.3
Italy	432 347	446 120	390 975	328 245	311 176	–28.0
Japan	1 095 855	1 176 796	1 143 358	1 128 837	1 078 033	–1.6
Latvia[a]	8 290	–3 893	7 291	4 671	7 956	–4.0
Liechtenstein	206	241	211	166	165	–19.6
Lithuania[a]	30 062	2 274	3 483	9 634	9 631	–68.0
Luxembourg	11 928	7 993	11 083	8 836	9 344	–21.7
Malta	2 411	2 549	2 584	1 557	1 535	–36.3
Monaco	98	100	78	73	75	–23.9
Netherlands	168 870	177 885	187 287	169 395	164 985	–2.3
New Zealand	–3 161	3 846	6 757	13 241	11 512	–464.2
Norway	24 832	17 536	19 296	20 059	19 668	–20.8
Poland[a, b]	451 322	279 834	299 734	299 851	300 549	–33.4
Portugal	45 355	59 018	41 123	62 726	44 769	–1.3
Romania[a, b]	190 335	72 818	61 729	54 552	50 658	–73.4
Russian Federation[a]	2 415 526	953 759	854 984	1 015 646	1 050 661	–56.5
Slovakia[a]	51 851	31 349	32 327	29 445	30 359	–41.4
Slovenia[a, b]	11 863	11 330	10 206	14 057	14 701	23.9
Spain	194 581	270 847	246 034	235 266	231 105	18.8
Sweden	21 113	13 178	6 226	–2 442	–1 974	–109.4
Switzerland	42 136	49 416	42 561	36 799	35 521	–15.7
Turkey[d]	95 605	167 962	240 895	325 315	324 491	239.4
Ukraine[a]	646 408	239 555	262 618	212 816	234 152	–63.8
United Kingdom	598 851	562 016	502 196	377 368	369 249	–38.3
United States	4 267 554	5 175 791	4 946 085	4 463 588	4 625 260	8.4
Number of Parties showing a decrease in emissions of more than 1%:						*34*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*9*

[a] EIT Party.
[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.
[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.
[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 9
Total anthropogenic CH_4 emissions without emissions and removals from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	124 383	116 699	106 259	108 171	109 532	–11.9
Austria	10 391	8 393	7 309	6 626	6 439	–38.0
Belarus[a]	17 459	12 286	15 151	15 932	16 098	–7.8
Belgium	12 215	11 027	8 794	7 932	7 849	–35.7
Bulgaria[a, b]	16 638	10 069	7 844	7 001	6 754	–59.4
Canada	90 485	112 024	91 559	91 893	91 424	1.0
Croatia[a]	4 382	3 426	4 145	4 069	3 889	–11.3
Cyprus	661	793	832	875	885	33.7
Czechia[a]	23 528	15 379	14 446	13 280	13 155	–44.1
Denmark	7 942	8 195	7 668	7 281	7 368	–7.2
Estonia[a]	1 901	1 238	1 244	1 129	1 117	–41.2
European Union[c]	728 947	606 071	490 885	452 762	446 029	–38.8
Finland	7 685	6 561	5 355	4 605	4 541	–40.9
France	69 877	70 148	62 197	57 379	56 500	–19.1
Germany	121 193	88 606	59 181	54 738	52 642	–56.6
Greece	11 042	11 736	11 068	10 059	10 091	–8.6
Hungary[a, b]	12 756	8 566	7 714	7 374	7 272	–43.0
Iceland	611	680	682	637	630	3.2
Ireland	14 761	14 338	12 070	13 992	13 985	–5.3
Italy	48 247	50 766	46 980	43 658	43 033	–10.8
Japan	44 418	37 982	34 784	30 237	29 855	–32.8
Latvia[a]	3 595	1 873	1 791	1 813	1 734	–51.8
Liechtenstein	19	17	19	18	18	–5.6
Lithuania[a]	7 006	3 861	3 684	3 277	3 064	–56.3
Luxembourg	582	585	592	594	588	1.0
Malta	105	175	180	191	200	89.8
Monaco	2	1	1	1	1	–39.3
Netherlands	31 847	24 279	19 406	18 012	17 309	–45.7
New Zealand	32 288	35 341	34 320	34 255	34 286	6.2
Norway	6 032	5 975	5 390	4 867	4 805	–20.3
Poland[a, b]	75 711	53 097	51 156	49 238	48 753	–35.6
Portugal	9 590	11 121	10 154	9 168	9 126	–4.8
Romania[a, b]	74 074	36 329	31 037	28 707	28 184	–62.0
Russian Federation[a]	463 736	317 015	351 950	383 900	396 034	–14.6
Slovakia[a]	7 255	5 319	4 798	4 616	4 442	–38.8
Slovenia[a, b]	2 614	2 498	2 158	1 994	1 936	–25.9
Spain	35 609	42 768	40 525	39 586	39 722	11.6
Sweden	7 419	6 833	5 217	4 470	4 381	–41.0
Switzerland	6 044	5 307	5 154	4 868	4 840	–19.9
Turkey[d]	42 405	43 557	51 319	54 231	57 576	35.8
Ukraine[a]	182 573	117 953	84 568	63 654	67 520	–63.0
United Kingdom	133 060	109 037	64 242	51 966	51 936	–61.0
United States	774 410	703 011	682 336	630 304	634 457	–18.1
Number of Parties showing a decrease in emissions of more than 1%:						*35*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*8*

[a] EIT Party.
[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.
[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.
[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 10
Total anthropogenic CH_4 emissions with emissions and removals from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	142 844	135 464	123 272	125 559	125 300	–12.3
Austria	10 416	8 417	7 333	6 650	6 463	–38.0
Belarus[a]	17 466	12 295	15 156	15 936	16 110	–7.8
Belgium	12 216	11 027	8 794	7 932	7 849	–35.7
Bulgaria[a, b]	16 639	10 203	7 859	7 012	6 757	–59.4
Canada	91 341	112 976	92 235	92 512	92 008	0.7
Croatia[a]	4 384	3 523	4 147	4 138	3 890	–11.3
Cyprus	661	800	833	876	885	33.8
Czechia[a]	23 572	15 420	14 502	13 294	13 178	–44.1
Denmark	8 198	8 461	7 945	7 577	7 670	–6.4
Estonia[a]	1 964	1 302	1 307	1 194	1 184	–39.7
European Union[c]	736 096	613 707	496 652	460 714	451 580	–38.7
Finland	9 219	7 909	6 333	5 374	5 310	–42.4
France	70 918	71 941	63 407	58 636	57 729	–18.6
Germany	122 060	89 470	60 048	55 603	53 608	–56.1
Greece	11 105	11 944	11 085	10 078	10 110	–9.0
Hungary[a, b]	12 781	8 592	7 723	7 393	7 282	–43.0
Iceland	4 330	4 383	4 335	4 278	4 226	–2.4
Ireland	15 211	14 765	12 720	14 661	14 445	–5.0
Italy	49 429	51 449	47 289	45 005	43 203	–12.6
Japan	44 518	38 073	34 865	30 333	29 929	–32.8
Latvia[a]	4 057	2 350	2 222	2 432	2 428	–40.2
Liechtenstein	19	17	19	18	18	–5.6
Lithuania[a]	7 009	3 865	3 686	3 277	3 065	–56.3
Luxembourg	582	585	592	594	588	1.0
Malta	105	175	180	191	200	89.8
Monaco	2	1	1	1	1	–39.3
Netherlands	31 847	24 280	19 406	18 013	17 309	–45.6
New Zealand	32 382	35 422	34 418	34 347	34 362	6.1
Norway	6 177	6 125	5 542	5 019	4 957	–19.7
Poland[a, b]	75 746	53 123	51 165	49 243	48 770	–35.6
Portugal	9 890	11 455	10 420	10 427	9 221	–6.8
Romania[a, b]	74 074	36 333	31 037	28 709	28 186	–61.9
Russian Federation[a]	484 925	337 300	374 695	407 643	426 101	–12.1
Slovakia[a]	7 265	5 344	4 816	4 638	4 463	–38.6
Slovenia[a, b]	2 615	2 499	2 158	1 995	1 936	–26.0
Spain	35 923	43 061	40 612	39 751	39 887	11.0
Sweden	7 891	7 309	5 669	4 913	4 875	–38.2
Switzerland	6 074	5 321	5 167	4 882	4 878	–19.7
Turkey[d]	42 481	43 717	51 342	54 289	57 593	35.6
Ukraine[a]	182 610	117 969	84 605	63 682	67 537	–63.0
United Kingdom	133 078	109 071	64 284	51 999	51 972	–60.9
United States	778 812	708 732	688 873	645 552	649 703	–16.6
Number of Parties showing a decrease in emissions of more than 1%:						*36*
Number of Parties showing a change in emissions within 1%:						*1*
Number of Parties showing an increase in emissions of more than 1%:						*6*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 11
Total anthropogenic N_2O emissions without emissions and removals from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	15 938	19 366	19 711	21 266	20 114	26.2
Austria	4 321	4 319	3 389	3 562	3 526	–18.4
Belarus[a]	16 618	12 425	13 969	14 435	14 020	–15.6
Belgium	10 073	10 211	7 587	5 979	5 702	–43.4
Bulgaria[a, b]	10 506	4 167	4 338	5 342	5 240	–50.1
Canada	38 865	35 853	33 392	36 557	37 945	–2.4
Croatia[a]	2 913	2 429	2 450	1 731	1 686	–42.1
Cyprus	292	350	321	296	297	1.5
Czechia[a]	9 386	6 481	5 401	6 420	6 072	–35.3
Denmark	8 170	7 116	5 404	5 620	5 421	–33.6
Estonia[a]	1 469	683	813	924	912	–37.9
European Union[c]	380 749	303 953	239 061	240 270	235 384	–38.2
Finland	6 356	5 801	4 808	4 820	4 769	–25.0
France	66 381	55 215	41 993	42 013	40 322	–39.3
Germany	62 523	41 763	36 236	37 541	35 518	–43.2
Greece	7 465	6 370	5 490	4 365	4 285	–42.6
Hungary[a, b]	11 133	5 405	3 728	4 801	4 859	–56.4
Iceland	378	349	306	322	305	–19.3
Ireland	7 729	7 958	6 346	6 749	6 954	–10.0
Italy	26 036	28 648	19 078	18 007	17 695	–32.0
Japan	31 876	29 906	22 195	20 418	20 000	–37.3
Latvia[a]	3 189	1 559	1 748	1 933	1 874	–41.3
Liechtenstein	10	9	9	9	9	–10.2
Lithuania[a]	5 239	3 766	3 014	3 068	2 955	–43.6
Luxembourg	310	319	297	312	313	0.8
Malta	57	61	53	42	43	–24.5
Monaco	2	3	4	3	3	38.9
Netherlands	18 033	16 145	8 629	8 658	8 349	–53.7
New Zealand	4 927	6 177	6 874	7 499	7 592	54.1
Norway	4 112	3 828	2 475	2 381	2 349	–42.9
Poland[a, b]	30 709	24 243	20 915	21 970	22 106	–28.0
Portugal	3 885	4 437	3 461	3 250	3 217	–17.2
Romania[a, b]	19 223	9 614	7 793	7 853	8 618	–55.2
Russian Federation[a]	146 044	75 644	75 000	86 252	85 932	–41.2
Slovakia[a]	4 314	2 550	2 443	2 017	2 099	–51.4
Slovenia[a, b]	841	903	736	735	753	–10.4
Spain	18 292	21 806	18 198	18 530	18 414	0.7
Sweden	5 740	5 333	4 823	4 757	4 504	–21.5
Switzerland	3 327	3 307	3 013	3 083	2 880	–13.4
Turkey[d]	24 829	24 682	29 602	38 842	38 924	56.8
Ukraine[a]	53 434	23 781	27 373	34 855	38 648	–27.7
United Kingdom	46 211	26 686	19 905	19 306	19 210	–58.4
United States	434 624	423 310	431 424	421 259	434 529	0.0
Number of Parties showing a decrease in emissions of more than 1%:						*35*
Number of Parties showing a change in emissions within 1%:						*3*
Number of Parties showing an increase in emissions of more than 1%:						*5*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 12
Total anthropogenic N_2O emissions with emissions and removals from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	20 237	23 691	24 408	25 084	23 564	16.4
Austria	4 465	4 455	3 523	3 697	3 661	–18.0
Belarus[a]	16 635	12 445	13 985	14 451	14 081	–15.4
Belgium	10 084	10 259	7 680	6 080	5 803	–42.4
Bulgaria[a, b]	10 747	4 499	4 690	5 845	5 736	–46.6
Canada	39 304	36 359	33 751	36 891	38 266	–2.6
Croatia[a]	2 962	2 534	2 554	1 900	1 808	–39.0
Cyprus	293	352	322	296	297	1.6
Czechia[a]	9 426	6 515	5 445	6 435	6 090	–35.4
Denmark	8 198	7 145	5 436	5 658	5 462	–33.4
Estonia[a]	1 725	943	1 090	1 208	1 197	–30.6
European Union[c]	395 987	319 492	254 164	256 056	250 844	–36.7
Finland	8 487	7 950	6 915	6 837	6 789	–20.0
France	69 652	58 449	45 171	45 177	43 461	–37.6
Germany	63 307	42 510	37 392	38 916	36 935	–41.7
Greece	7 472	6 397	5 507	4 381	4 301	–42.4
Hungary[a, b]	11 154	5 469	3 776	4 851	4 900	–56.1
Iceland	379	350	307	324	307	–18.8
Ireland	7 872	8 160	6 799	7 212	7 358	–6.5
Italy	26 961	29 383	19 507	18 529	18 168	–32.6
Japan	32 095	30 105	22 377	20 607	20 190	–37.1
Latvia[a]	3 732	2 136	2 333	2 546	2 500	–33.0
Liechtenstein	10	10	10	9	10	–9.0
Lithuania[a]	5 367	3 895	3 171	3 245	3 127	–41.7
Luxembourg	332	340	314	324	324	–2.4
Malta	57	62	53	43	43	–24.8
Monaco	2	3	4	3	3	38.6
Netherlands	18 039	16 208	8 734	8 755	8 449	–53.2
New Zealand	5 143	6 418	7 069	7 609	7 692	49.6
Norway	4 364	4 119	2 798	2 711	2 679	–38.6
Poland[a, b]	31 267	24 655	21 265	22 584	22 795	–27.1
Portugal	4 462	4 930	3 859	3 818	3 549	–20.5
Romania[a, b]	20 464	11 337	9 635	9 696	10 450	–48.9
Russian Federation[a]	156 660	91 734	87 007	101 868	105 991	–32.3
Slovakia[a]	4 410	2 605	2 473	2 054	2 136	–51.6
Slovenia[a, b]	898	957	780	767	783	–12.8
Spain	18 664	22 344	18 526	18 834	18 702	0.2
Sweden	7 016	6 631	6 080	5 995	5 756	–18.0
Switzerland	3 381	3 353	3 058	3 129	2 925	–13.5
Turkey[d]	24 879	24 798	29 644	38 916	39 041	56.9
Ukraine[a]	53 627	24 059	27 569	34 993	38 818	–27.6
United Kingdom	48 661	28 971	21 682	20 920	20 807	–57.2
United States	437 598	428 281	436 331	432 086	445 408	1.8
Number of Parties showing a decrease in emissions of more than 1%:						*36*
Number of Parties showing a change in emissions within 1%:						*1*
Number of Parties showing an increase in emissions of more than 1%:						*6*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 13
Total aggregate anthropogenic emissions of F-gases

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	*2000*	*2010*	*2017*	*2018*	
Australia	6 252	3 113	9 098	12 079	12 447	99.1
Austria	1 656	1 387	1 904	2 207	2 266	36.8
Belarus[a]		0.1	2	3	3	
Belgium	3 813	1 730	3 373	4 638	4 697	23.2
Bulgaria[a, b]	3	40	682	1 834	2 271	>10 000
Canada	11 755	10 643	10 030	12 554	13 476	14.6
Croatia[a]	1 251	160	388	495	500	–60.1
Cyprus	80	169	276	288	297	273.4
Czechia[a]	84	531	2 552	3 717	3 811	4 424.1
Denmark	42	853	905	564	659	1 453.6
Estonia[a]		82	177	234	234	>10 000
European Union[c]	72 031	79 766	115 246	116 999	110 928	54.0
Finland	53	745	1 387	1 239	1 200	2 176.4
France	11 840	12 095	19 085	19 022	17 060	44.1
Germany	13 395	13 278	14 251	15 363	14 846	10.8
Greece	1 376	5 388	4 603	6 309	6 048	339.5
Hungary[a, b]	378	655	1 292	1 921	1 460	285.9
Iceland	496	195	281	261	247	–50.2
Ireland	35	769	1 114	1 354	1 192	3 347.3
Italy	3 759	4 618	14 010	18 186	18 716	397.9
Japan	35 354	42 042	31 502	50 923	52 800	49.3
Latvia[a]		65	221	279	279	
Liechtenstein	0.0001	4	10	11	10	>10 000
Lithuania[a]		23	263	726	578	
Luxembourg	1	33	61	79	78	5 965.0
Malta	0.01	8	169	370	412	>10 000
Monaco	0.1	4	5	8	8	9 356.2
Netherlands	8 476	6 927	3 128	1 762	1 928	–77.2
New Zealand	930	304	1 116	1 734	1 903	104.7
Norway	5 993	2 793	1 373	1 576	1 051	–82.5
Poland[a, b]	147	1 272	6 248	6 131	4 291	2 814.2
Portugal		443	2 146	3 309	3 455	
Romania[a, b]	4 447	1 755	1 054	2 239	2 362	–46.9
Russian Federation[a]	52 433	37 356	18 043	38 939	46 797	–10.8
Slovakia[a]	315	133	642	755	720	128.6
Slovenia[a, b]	243	191	286	372	325	33.6
Spain	4 268	12 935	16 411	7 511	6 465	51.5
Sweden	677	1 264	1 385	1 180	1 129	66.7
Switzerland	254	849	1 510	1 740	1 717	577.3
Turkey[d]	625	730	3 582	5 351	5 247	739.1
Ukraine[a]	236	132	780	1 038	1 383	486.3
United Kingdom	17 354	12 337	17 481	15 184	13 936	–19.7
United States	99 666	151 006	169 797	183 065	182 782	83.4
Number of Parties showing a decrease in emissions of more than 1%:						*7*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*28*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 14
Net anthropogenic CO_2 emissions and removals from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	169 893	32 914	31 257	–48 332	–39 819	–123.4
Austria	–12 157	–16 551	–5 936	–5 011	–5 311	–56.3
Belarus[a]	–20 590	–32 581	–39 387	–13 097	–22 705	10.3
Belgium	–3 249	–1 803	–794	–1 124	–1 116	–65.7
Bulgaria[a, b]	–19 470	–18 789	–13 027	–8 910	–8 961	–54.0
Canada	–60 922	–33 249	–26 279	–17 367	–13 766	–77.4
Croatia[a]	–6 471	–7 152	–7 032	–4 729	–5 218	–19.4
Cyprus	–219	–45	–400	–420	–400	82.7
Czechia[a]	–5 771	–8 118	–6 340	–2 343	5 753	–199.7
Denmark	6 173	4 945	237	4 153	6 252	1.3
Estonia[a]	–1 945	–3 529	–4 080	–2 184	–2 342	20.4
European Union[c]	–277 292	–337 147	–355 630	–285 415	–293 975	6.0
Finland	–18 431	–22 395	–25 547	–19 969	–13 057	–29.2
France	–25 911	–21 880	–41 270	–30 734	–29 750	14.8
Germany	–30 464	–36 917	–21 687	–28 869	–29 315	–3.8
Greece	–2 177	–2 176	–3 077	–3 243	–3 013	38.4
Hungary[a, b]	–1 803	–764	–4 380	–5 243	–4 711	161.3
Iceland	5 624	5 535	5 607	5 410	5 412	–3.8
Ireland	4 327	4 836	4 428	4 206	3 433	–20.7
Italy	–5 662	–22 322	–42 713	–23 229	–36 909	551.9
Japan	–62 537	–88 049	–70 710	–58 825	–57 655	–7.8
Latvia[a]	–11 214	–10 958	–1 258	–2 552	97	–100.9
Liechtenstein	7	24	20	10	22	224.1
Lithuania[a]	–5 710	–9 600	–10 444	–3 912	–4 039	–29.3
Luxembourg	80	–739	–136	–414	–224	–380.4
Malta	3	3	2	4	4	31.0
Monaco	–0.01	–0.05	–0.06	–0.01	–0.03	184.5
Netherlands	6 485	5 997	5 169	4 950	4 815	–25.7
New Zealand	–28 607	–28 436	–28 201	–22 913	–23 569	–17.6
Norway	–10 489	–24 983	–26 935	–23 503	–24 150	130.2
Poland[a, b]	–20 449	–37 504	–34 873	–37 490	–37 156	81.7
Portugal	272	–6 509	–11 866	8 006	–6 714	–2 569.7
Romania[a, b]	–18 314	–22 638	–22 561	–23 525	–26 293	43.6
Russian Federation[a]	–109 768	–517 293	–757 901	–630 533	–640 700	483.7
Slovakia[a]	–9 783	–9 940	–6 196	–6 642	–5 728	–41.4
Slovenia[a, b]	–4 806	–4 115	–6 170	–208	213	–104.4
Spain	–36 633	–40 420	–37 691	–39 405	–38 550	5.2
Sweden	–36 236	–41 507	–46 817	–44 749	–43 740	20.7
Switzerland	–2 019	5 798	–2 489	–1 383	–1 375	–31.9
Turkey[d]	–55 903	–61 829	–73 485	–100 014	–94 704	69.4
Ukraine[a]	–59 422	–45 783	–31 460	–10 416	2 457	–104.1
United Kingdom	–2 336	–6 204	–10 669	–11 435	–11 601	396.6
United States	–860 747	–822 279	–751 971	–790 019	–799 622	–7.1
Number of Parties showing a decrease in emissions of more than 1%:						*23*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions of more than 1%:						*20*

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 15
Anthropogenic CH_4 emissions from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	18 460	18 764	17 013	17 388	15 768	–14.6
Austria	24	24	24	24	24	–1.3
Belarus[a]	8	9	5	5	12	57.4
Belgium	1	0.002				
Bulgaria[a, b]	1	135	15	11	3	214.5
Canada	856	952	676	619	584	–31.7
Croatia[a]	1	97	2	69	1	5.8
Cyprus	0.1	7	1	0.4	1	1 314.6
Czechia[a]	44	41	57	14	23	–48.1
Denmark	256	266	278	296	301	17.6
Estonia[a]	62	64	64	64	67	7.0
European Union[c]	7 149	7 636	5 767	7 952	5 550	–22.4
Finland	1 534	1 348	978	769	769	–49.8
France	1 041	1 793	1 209	1 257	1 229	18.1
Germany	868	864	867	865	966	11.3
Greece	63	208	16	19	19	–69.0
Hungary[a, b]	25	26	9	19	10	–61.3
Iceland	3 720	3 702	3 653	3 641	3 596	–3.3
Ireland	451	427	650	669	460	2.1
Italy	1 181	683	309	1 347	171	–85.6
Japan	99	91	81	95	74	–25.1
Latvia[a]	463	477	431	618	694	50.1
Liechtenstein						
Lithuania[a]	3	4	1	0.3	1	–79.7
Luxembourg						
Malta						
Monaco						
Netherlands	0.2	0.3	0.3	0.3	0.3	32.8
New Zealand	94	81	98	92	75	–20.2
Norway	145	150	152	152	153	5.3
Poland[a, b]	35	26	9	5	17	–52.4
Portugal	300	334	266	1 259	95	–68.4
Romania[a, b]	0.1	3	0.2	2	2	2 336.7
Russian Federation[a]	21 190	20 285	22 745	23 743	30 068	41.9
Slovakia[a]	10	25	18	21	21	107.5
Slovenia[a, b]	1	0.5	0.3	1	0.1	–93.4
Spain	314	292	88	165	165	–47.5
Sweden	472	476	452	443	495	4.7
Switzerland	30	15	13	14	38	29.4
Turkey[d]	76	160	23	58	17	–77.7
Ukraine[a]	38	16	38	29	17	–55.8
United Kingdom	18	34	41	33	35	95.8
United States	4 402	5 721	6 537	15 247	15 246	246.3
Number of Parties showing a decrease in emissions by more than 1%:						*19*
Number of Parties showing a change in emissions within 1%:						*0*
Number of Parties showing an increase in emissions by more than 1%:						*19*

[a] EIT Party.
[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.
[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.
[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 16
Anthropogenic N_2O emissions from land use, land-use change and forestry

Party	kt CO_2 eq					Change 1990–2018 (%)
	1990	2000	2010	2017	2018	
Australia	4 299	4 324	4 697	3 818	3 450	–19.8
Austria	144	136	135	135	135	–6.4
Belarus[a]	17	20	16	16	62	263.8
Belgium	11	47.898	92	102	101	835.0
Bulgaria[a, b]	241	333	352	502	497	106.0
Canada	440	506	360	334	321	–26.9
Croatia[a]	48	104	104	170	122	153.8
Cyprus	0.02	3	0.4	0.1	0.3	1 314.6
Czechia[a]	40	34	43	14	18	–54.9
Denmark	28	29	32	38	41	49.7
Estonia[a]	256	260	277	285	285	11.2
European Union[c]	15 237	15 539	15 103	15 786	15 460	1.5
Finland	2 131	2 149	2 107	2 017	2 020	–5.2
France	3 271	3 233	3 178	3 164	3 139	–4.0
Germany	784	747	1 157	1 375	1 417	80.8
Greece	6	27	17	16	16	142.8
Hungary[a, b]	21	64	49	50	42	96.1
Iceland	0.2	1	2	2	2	655.5
Ireland	143	202	454	463	405	182.4
Italy	925	735	429	522	473	–48.8
Japan	219	199	182	189	190	–13.1
Latvia[a]	543	577	585	613	626	15.4
Liechtenstein	0.3	0.4	0.4	0.4	0.4	31.0
Lithuania[a]	129	129	158	176.8	171	33.2
Luxembourg	21	21	17	12	11	–49.4
Malta	1	1	0.5	0.5	0.5	–44.9
Monaco	0.01	0.01	0.01	0.01	0.01	–16.4
Netherlands	6.8	62.3	105.2	97.4	99.7	1 358.5
New Zealand	215	242	196	110	99	–54.0
Norway	252	291	324	331	330	30.8
Poland[a, b]	558	412	350	614	689	23.4
Portugal	577	493	398	568	332	–42.5
Romania[a, b]	1 240.9	1 723	1 842.7	1 843	1 832	47.7
Russian Federation[a]	10 615	16 090	12 007	15 615	20 059	89.0
Slovakia[a]	97	55	30	37	37	–61.5
Slovenia[a, b]	57	53.7	44.6	32	29.8	–47.9
Spain	371	538	328	304	289	–22.3
Sweden	1 276	1 299	1 257	1 238	1 252	–1.9
Switzerland	54	45	45	46	45	–16.7
Turkey[d]	50	116	42	74	117	133.2
Ukraine[a]	193	278	196	139	170	–11.9
United Kingdom	2 451	2 285	1 776	1 614	1 597	–34.8
United States	2 974	4 971	4 907	10 828	10 880	265.8
Number of Parties showing a decrease in emissions of more than 1%:						20
Number of Parties showing a change in emissions within 1%:						0
Number of Parties showing an increase in emissions of more than 1%:						23

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.

Table 17
Indirect CO_2 emissions

	kt CO_2 eq					*Change 1990–2018*
Party	*1990*	*2000*	*2010*	*2017*	*2018*	*(%)*
Australia						
Austria						
Belarus[a]						
Belgium						
Bulgaria[a, b]						
Canada	786	890	584	514	490	–37.7
Croatia[a]						
Cyprus						
Czechia[a]	1 865	1 175	978	718	690	–63.0
Denmark	1 133	829	482	293	281	–75.2
Estonia[a]						
European Union[c]	4 209	2 856	2 203	1 728	1 612	–61.7
Finland	166	108	69	53	52	–68.5
France						
Germany						
Greece						
Hungary[a, b]						
Iceland						
Ireland						
Italy						
Japan	5 482	4 233	2 410	2 077	2 063	–62.4
Latvia[a]	40	25	16	19	12	–70.8
Liechtenstein						
Lithuania[a]						
Luxembourg						
Malta						
Monaco						
Netherlands	917.2	531.6	458.2	453.0	440.4	–52.0
New Zealand						
Norway						
Poland[a, b]						
Portugal	88	189	200	192	137	55.1
Romania[a, b]						
Russian Federation[a]						
Slovakia[a]						
Slovenia[a, b]						
Spain						
Sweden						
Switzerland	380	181	117	98	99	–74.0
Turkey[d]						
Ukraine[a]						
United Kingdom						
United States						
Number of Parties showing a decrease in emissions of more than 1%:					*9*	
Number of Parties showing a change in emissions within 1%:					*0*	
Number of Parties showing an increase in emissions of more than 1%:					*1*	

Note: In accordance with annex I to decision 24/CP.19, Annex I Parties may report indirect CO_2 from the atmospheric oxidation of CH_4, carbon monoxide and non-methane volatile organic compounds. Ten Parties voluntarily reported indirect CO_2 emissions in their 2020 inventory submissions.

[a] EIT Party.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Annex I Parties.