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## **Subsidiary Body for Implementation**

### **Sixty-first session**

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Item 3(c) of the provisional agenda

### **Reporting from and review of Parties included in Annex I to the Convention**

### **Reports on national greenhouse gas inventory data from Parties included in Annex I to the Convention**

## **National greenhouse gas inventory data for the period 1990–2022**

### **Report by the secretariat**

#### *Summary*

In decision [6/CP.27](#) the deadline for the submission by Parties included in Annex I to the Convention of their greenhouse gas inventories due in 2024 was changed to 31 December 2024. The information on those Parties' GHG emissions and removals for 1990–2022 presented in this document is based on the national inventory reports received from them as at 2 August 2024.

## Abbreviations and acronyms

Annex I Party	Party included in Annex I to the Convention
C	confidential
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
COP	Conference of the Parties
CRT	common reporting table
F-gas	fluorinated gas
GHG	greenhouse gas
IE	included elsewhere
LULUCF	land use, land-use change and forestry
N <sub>2</sub> O	nitrous oxide
NA	not applicable
NE	not estimated
NID	national inventory document
NIR	national inventory report
NO	not occurring

## I. Introduction

### A. Mandate

1. The COP requested Annex I Parties to submit national inventory data on GHG emissions by sources and removals by sinks by 15 April of each year.<sup>1</sup> 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.<sup>2</sup>
2. COP 24 decided that, to fulfil national inventory reporting obligations under the Convention, Parties to the Paris Agreement submitting annual NIRs under the Convention shall use the modalities, procedures and guidelines for NIRs contained in chapter II of the annex to decision [18/CMA.1](#) by the date that the reports are first due under the Paris Agreement.<sup>3</sup>
3. COP 27 decided to change the deadline for the submission by Annex I Parties that are Parties to the Paris Agreement of their annual GHG inventories due in 2024 to 31 December 2024.<sup>4</sup>

### B. Scope

4. This document presents the status of reporting of GHG inventories by Annex I Parties in 2024 (see chap. II below) and provides a summary of the latest available data on those Parties' GHG emissions and removals for 1990–2022 (see chap. III below). Data are provided for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, as well as for F-gases,<sup>5</sup> and, where Parties have elected to report them, indirect CO<sub>2</sub> emissions from the atmospheric oxidation of CH<sub>4</sub>, carbon monoxide and non-methane volatile organic compounds. Data are provided on total<sup>6</sup> aggregate<sup>7</sup> GHG emissions, both with and without net GHG emissions and removals from LULUCF.
5. The information provided in this document is based on the NIRs<sup>8</sup> received from Annex I Parties (see table 1) as at 2 August 2024. Data were compiled from the information reported in the NIDs and/or, where available, the CRTs. With regard to net CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions from LULUCF, some additional values were calculated so that a complete set of data could be presented in the tables below.

### C. Possible action by the Subsidiary Body for Implementation

6. The Subsidiary Body for Implementation may wish to take note of the information herein and to seek guidance from the COP, as appropriate.

## II. Status of reporting

7. According to the modalities, procedures and guidelines for NIRs, the NIR consists of an NID and the CRTs, including a time series of data for 1990 up to no more than two years prior to the submission of the NIR.

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<sup>1</sup> Decision [3/CP.1](#), para. 2(b).

<sup>2</sup> Decision [13/CP.20](#), paras. 8 and 10.

<sup>3</sup> Decision [1/CP.24](#), para. 42.

<sup>4</sup> Decision [6/CP.27](#), para. 6.

<sup>5</sup> Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, an unspecified mix of hydrofluorocarbons and perfluorocarbons, and nitrogen trifluoride.

<sup>6</sup> The term “total” implies that emissions from the CRT sectors are summed; the inclusion of emissions from LULUCF in the sum is indicated separately, as appropriate; unless stated otherwise, totals do not include indirect CO<sub>2</sub> emissions.

<sup>7</sup> The term “aggregate” implies that GHG emissions and removals are calculated as a weighted sum of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and F-gases using the global warming potential values agreed under the Convention.

<sup>8</sup> Available at <https://unfccc.int/ghg-inventories-annex-i-parties/2024>.

8. As at 2 August 2024, GHG inventory data for 1990–2022 had been received from seven Annex I Parties, comprising NIDs from seven Parties and CRTs from one of those Parties. The dates of the initial submissions of the NIDs and CRTs are shown in table 1.

Table 1  
**Greenhouse gas inventory submissions from Annex I Parties as at 2 August 2024**

<i>Party</i>	<i>NID submission date</i>	<i>CRTs submission date</i>
Australia	12 April 2024	12 April 2024
Canada	2 May 2024	–
Germany	15 April 2024	–
Japan	12 April 2024	–
Liechtenstein	30 April 2024	–
Switzerland	11 April 2024	–
United States of America	12 April 2024	–

### III. Latest available data on Annex I Parties' emissions and removals

9. Since not all Annex I Parties have yet submitted their NIDs and/or CRTs due by 31 December 2024, it was not possible to present the trends in their total aggregate GHG emissions, both with and without LULUCF, in this document.

10. Tables 2–14 present detailed GHG inventory data for 1990–2022 for the individual Annex I Parties that had submitted their NIDs (and in some cases CRTs) by the time of preparation of this document: total aggregate GHG emissions with and without emissions and removals from LULUCF in tables 2–3; emissions of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O (with and without emissions and removals from LULUCF) in tables 4–9; F-gas emissions in table 10; emissions and removals from LULUCF in tables 11–13; and indirect CO<sub>2</sub> emissions in table 14.

11. The cells with an en dash (–) 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.

12. The changes in emissions from 1990 to 2022 were calculated using exact (not rounded) values and may therefore differ from percentage changes calculated with the rounded numbers provided in the tables.

Table 2

**Total aggregate anthropogenic emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and F-gases without emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	437 120	534 477	535 776	527 276	520 995	19.2
Canada	607 749	761 493	686 362	698 442	707 768	16.5
Germany	1 250 658	987 522	731 755	759 600	749 965	–40.0
Japan	1 269 400	1 378 000	1 140 500	1 162 200	1 133 600	–10.7
Liechtenstein	229	264	180	183	166	–27.7
Switzerland	54 666	55 917	43 697	45 043	41 536	–24.0
United States	6 536 900	7 494 600	6 001 800	6 328 800	6 343 200	–3.0
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						5
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						2

Table 3

**Total aggregate anthropogenic emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and F-gases with emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	615 387	609 446	474 544	438 745	432 621	–29.7
Canada	656 933	827 487	712 004	711 979	759 227	15.6
Germany	1 283 538	996 386	737 550	762 220	754 345	–41.2
Japan	1 196 700	1 287 200	1 082 200	1 103 900	1 080 500	–9.7
Liechtenstein	236	273	182	180	164	–30.3
Switzerland	51 707	52 706	43 046	43 769	41 970	–18.8
United States	5 560 200	6 586 900	5 097 400	5 418 200	5 489 000	–1.3
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						6
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 4

**Total anthropogenic CO<sub>2</sub> emissions without emissions and removals from land use, land-use change and forestry**

Party	kt					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	278 160	386 176	399 184	389 020	384 362	38.2
Canada	458 015	572 855	526 582	540 312	550 612	20.2
Germany	1 054 796	867 881	648 357	678 777	671 472	–36.3
Japan	1 157 400	1 290 300	1 040 500	1 061 900	1 034 900	–10.6
Liechtenstein	199	229	142	146	128	–35.5
Switzerland	44 149	45 777	34 228	35 780	32 819	–25.7
United States	5 131 600	6 126 900	4 689 000	5 017 200	5 053 000	–1.5
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						5
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						2

Table 5  
**Total anthropogenic CO<sub>2</sub> emissions with emissions and removals from land use, land-use change and forestry**

Party	kt					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	431 510	437 317	320 425	283 374	278 682	–35.4
Canada	506 039	637 490	551 339	552 921	601 180	18.8
Germany	1 080 534	869 262	646 544	673 808	668 219	–38.2
Japan	1 083 700	1 198 700	981 700	1 003 100	981 200	–9.5
Liechtenstein	206	238	143	142	127	–38.3
Switzerland	41 101	42 506	33 516	34 444	33 183	–19.3
United States	4 096 900	5 150 300	3 716 200	4 033 800	4 131 200	0.8
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						5
<i>Number of Parties showing a change in emissions within 1%:</i>						1
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 6  
**Total anthropogenic CH<sub>4</sub> emissions without emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	140 144	125 747	110 010	109 825	108 473	–22.6
Canada	108 158	150 286	119 653	119 501	117 105	8.3
Germany	133 610	73 442	47 870	46 598	45 539	–65.9
Japan	49 800	38 200	30 400	30 400	29 900	–40.0
Liechtenstein	22	21	22	22	22	0.9
Switzerland	6 222	5 461	4 943	4 952	4 910	–21.1
United States	871 700	795 400	735 300	720 500	702 400	–19.4
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						5
<i>Number of Parties showing a change in emissions within 1%:</i>						1
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 7  
**Total anthropogenic CH<sub>4</sub> emissions with emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	160 771	145 146	124 198	123 765	122 431	–23.8
Canada	108 982	151 235	120 260	120 139	117 716	8.0
Germany	139 785	79 711	54 275	53 012	51 994	–62.8
Japan	49 900	38 200	30 500	30 500	29 900	–40.1
Liechtenstein	22	21	22	22	22	0.9
Switzerland	6 257	5 476	4 956	4 965	4 928	–21.2
United States	924 800	853 900	794 600	782 600	760 800	–17.7
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						5
<i>Number of Parties showing a change in emissions within 1%:</i>						1
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 8

**Total anthropogenic N<sub>2</sub>O emissions without emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	13 251	17 041	15 288	16 510	16 709	26.1
Canada	30 645	28 627	27 870	26 901	28 384	–7.4
Germany	49 928	32 621	23 976	23 327	23 007	–53.9
Japan	28 900	22 700	17 700	17 600	17 300	–40.1
Liechtenstein	9	8	8	8	8	–10.6
Switzerland	4 049	3 426	2 986	2 885	2 453	–39.4
United States	408 200	419 200	391 200	398 200	389 700	–4.5
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						6
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 9

**Total anthropogenic N<sub>2</sub>O emissions with emissions and removals from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	17 541	21 470	18 627	19 684	20 056	14.3
Canada	30 981	29 036	28 148	27 191	28 663	–7.5
Germany	50 895	33 834	25 178	24 504	24 184	–52.5
Japan	29 700	23 300	18 100	18 000	17 700	–40.4
Liechtenstein	9	8	8	8	8	–8.0
Switzerland	4 103	3 471	3 034	2 933	2 504	–39.0
United States	413 000	429 500	400 300	408 900	398 800	–3.4
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						6
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 10

**Total aggregate anthropogenic emissions of F-gases**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	5 565	5 513	11 295	11 922	11 451	105.8
Canada	10 930	9 725	12 257	11 728	11 668	6.7
Germany	12 324	13 579	11 552	10 897	9 948	–19.3
Japan	33 400	26 800	51 800	52 300	51 500	54.2
Liechtenstein	–	7	9	8	8	–
Switzerland	246	1 253	1 540	1 426	1 355	450.9
United States	125 400	153 100	186 300	192 900	198 200	58.1
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						1
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						5

Table 11  
**Net anthropogenic CO<sub>2</sub> emissions and removals from land use, land-use change and forestry**

Party	kt					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	153 350	51 141	–78 759	–105 645	–105 680	–168.9
Canada	48 024	64 636	24 758	12 609	50 568	5.3
Germany	25 738	1 381	–1 813	–4 970	–3 252	–112.6
Japan	–73 696	–91 593	–58 783	–58 762	–53 659	–27.2
Liechtenstein	7	9	1	–4	–1.5	–122.7
Switzerland	–3 048	–3 271	–712	–1 336	364	–111.9
United States	–1 034 700	–976 600	–972 800	–983 400	–921 800	–10.9
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						6
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						1

Table 12  
**Anthropogenic CH<sub>4</sub> emissions from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	20 627	19 399	14 188	13 940	13 959	–32.3
Canada	824	950	606	638	612	–25.8
Germany	6 175	6 269	6 405	6 414	6 455	4.5
Japan	117	98	80	88	80	–31.6
Liechtenstein	–	–	–	–	–	–
Switzerland	35	15	13	13	18	–48.6
United States	53 100	58 500	59 300	62 100	58 400	10.0
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						4
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						2

Table 13  
**Anthropogenic N<sub>2</sub>O emissions from land use, land-use change and forestry**

Party	kt CO <sub>2</sub> eq					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	4 290	4 429	3 339	3 174	3 347	–22.0
Canada	336	409	278	290	280	–16.8
Germany	967	1 213	1 202	1 177	1 177	21.7
Japan	871	632	399	402	405	–53.5
Liechtenstein	0.2	0.3	0.4	0.3	0.4	100.0
Switzerland	54	45	48	48	51	–5.6
United States	4 800	10 300	9 100	10 700	9 100	89.6
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						4
<i>Number of Parties showing a change in emissions within 1%:</i>						0
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						3



Table 14  
**Indirect CO<sub>2</sub> emissions**

Party	kt					Change 1990–2022 (%)
	1990	2005	2020	2021	2022	
Australia	–	–	–	–	–	–
Canada	637	779	478	505	482	–24.3
Germany	–	–	–	–	–	–
Japan	5 500	3 300	1 900	1 800	1 800	–67.3
Liechtenstein	–	–	–	–	–	–
Switzerland	392	144	100	95	94	–76.0
United States	–	–	–	–	–	–
<i>Number of Parties showing a decrease in emissions of more than 1%:</i>						<i>3</i>
<i>Number of Parties showing a change in emissions within 1%:</i>						<i>0</i>
<i>Number of Parties showing an increase in emissions of more than 1%:</i>						<i>0</i>

*Note:* According to the modalities, procedures and guidelines for NIRs, Parties may report indirect CO<sub>2</sub> emissions from atmospheric oxidation of CH<sub>4</sub>, carbon monoxide and non-methane volatile organic compounds.