



# REVIEW PRACTICE GUIDANCE

## **Implications of Changes in the UNFCCC Annex I Inventory Reporting Guidelines on the Review of Second Biennial Reports**

Background Paper for the 3<sup>rd</sup> Lead Reviewers Meeting, 3–4 March 2016, Bonn, Germany

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## I. Background

1. The Conference of the Parties (COP) at its nineteenth session 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 greenhouse gas inventories” (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines),<sup>1</sup> the revised common reporting format (CRF) tables and the updated global warming potential (GWP) values.

2. The COP requested Parties included in Annex I to the Convention (Annex I Parties) to begin to apply the UNFCCC Annex I inventory reporting guidelines in 2015. In the period up to 2015, the preparation of annual greenhouse gas (GHG) inventories was defined by the updated “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”<sup>2</sup> (hereinafter referred to as the UNFCCC reporting guidelines, Part I).

3. The key drivers for the revision of the UNFCCC reporting guidelines, Part I were the need to incorporate the latest Intergovernmental Panel on Climate Change (IPCC) *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) and the use of updated GWP values.

4. In accordance with the “UNFCCC biennial reporting guidelines for developed country Parties”<sup>3</sup> (hereinafter referred to as the UNFCCC reporting guidelines on BRs), information on GHG emissions and trends in biennial reports (BRs) should include:

- (a) Summary information from the national GHG inventory on emissions and emission trends for the period from 1990 to the latest reported year in the most recent inventory submission available;
- (b) Summary information on the national inventory arrangements in accordance with the related reporting requirements contained in the UNFCCC Annex I inventory reporting guidelines, and on the changes to these national inventory arrangements since the last national communication (NC) or BR.

5. The lead reviewers (LRs), at their 2<sup>nd</sup> meeting in March 2015, noted that the submission of the second biennial reports (BR2s) will include information regarding GHG emissions and removals that will probably be based on the revised UNFCCC Annex I inventory reporting guidelines and encouraged the expert review teams (ERTs) to take this into consideration when reviewing the BR2s and to compare the reported information with that contained in the first biennial reports (BR1s). The LRs requested the secretariat to prepare and provide information to the ERTs that would facilitate their understanding of the implications of these changes.<sup>4</sup>

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<sup>1</sup> Decision 24/CP.19, annexes I, II and III.

<sup>2</sup> FCCC/SBSTA/2006/9.

<sup>3</sup> Decision 2/CP.17.

<sup>4</sup> “Conclusions and recommendations. Second meeting of lead reviewers for the review of biennial reports and national communications”. Available at

## **II. Purpose and scope**

6. The purpose of this background paper is to facilitate the understanding of the ERTs on the changes in the UNFCCC Annex I inventory reporting guidelines and to further elaborate on the implications of these changes on the reporting in the BR2s by Annex I Parties of information on quantified economy-wide emission reduction target and related matters.

7. This background paper is based on a detailed comparative analysis of the latest revised UNFCCC Annex I inventory reporting guidelines and the previous UNFCCC reporting guidelines, Part I, as well as on information provided under the relevant section of the BR2s and BR1s (i.e. GHG emissions and trends; and assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target).

8. The first two sections introduce the subject, purpose and scope of this paper. Section III provides information on the key changes in the UNFCCC Annex I inventory reporting guidelines which have potential implications on the reporting of the BR2s and the results of the comparative analysis. Section IV discusses the implications of the changes on GHG emission levels and trends and on the description of the quantified economy-wide emission reduction target. Section V outlines the conclusions and recommendations for the ERTs. Annex I to this paper contains a detailed comparison of the content of the latest revised and previous reporting guidelines with a clear indication of the changes for easier identification by the ERTs. Annex II presents the new GWP values and the newly introduced GHGs, and annex III provides information on the implications of the changes on the description of the quantified economy-wide emission reduction target.

## **III. Changes in the UNFCCC Annex I inventory reporting guidelines relevant to the reporting and review of the second biennial reports**

9. A comparative analysis of the latest revised UNFCCC Annex I inventory reporting guidelines with the previous UNFCCC reporting guidelines, Part I shows that the changes can be grouped into two categories: those which are relevant and those which are not directly relevant to the reporting and review of the BR2s. The most important relevant changes, besides the overall methodological shift to the use of the 2006 IPCC Guidelines, are as follows:

- (a) Use of the updated GWP values from the IPCC Fourth Assessment Report;
- (b) Inclusion of new GHGs;
- (c) Inclusion of new categories;
- (d) New reporting elements on national inventory arrangements.

10. A complete and detailed comparative analysis of all changes between the previous and revised UNFCCC reporting guidelines, irrespective of their effect on the reporting and review of the BRs, is presented in annex I to this background paper.

**A. Use of the updated global warming potential values from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change**

11. Based on the latest scientific research on radiative forcing of different GHGs, the IPCC has published updated GWP values for different time horizons in its Fourth Assessment Report (AR4), which are presented in annex II to this paper.

12. The revised UNFCCC Annex I inventory reporting guidelines stipulate that Annex I Parties should report aggregate emissions and removals of GHGs, expressed in CO<sub>2</sub> equivalent (CO<sub>2</sub> eq), using the GWP values as agreed by decision 24/CP.19 (which are the exact values from the AR4) or any subsequent decision by the COP on GWP values.

13. For the main GHGs, the differences between the GWP values used in the previous reporting guidelines, which stipulated the use of GWP values from the IPCC Second Assessment Report, and the latest revised reporting guidelines are as follows: the GWP value for carbon dioxide (CO<sub>2</sub>) remains the same (i.e. 1); the GWP value for methane (CH<sub>4</sub>) has increased by 19 per cent, from 21 to 25; the GWP value for nitrous oxide (N<sub>2</sub>O) has decreased by 4 per cent, from 310 to 298; and for most of the fluorinated gases, the GWP values have increased (for details, see annex II to this paper).

**B. Inclusion of new greenhouse gases**

14. In accordance with the revised UNFCCC Annex I inventory reporting guidelines, as a minimum requirement, inventories shall contain information on the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>).

15. In addition, Annex I Parties should provide information on the following precursor gases: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>) and non-methane volatile organic compounds (NMVOCs), as well as sulphur oxides (SO<sub>x</sub>).

16. Annex I Parties may report indirect CO<sub>2</sub> emissions from the atmospheric oxidation of CH<sub>4</sub>, CO and NMVOCs. In addition, Annex I Parties may report as a memo item indirect N<sub>2</sub>O emissions from sources other than the agriculture and land use, land-use change and forestry (LULUCF) sectors. These estimates of indirect N<sub>2</sub>O emissions should not be included in the national totals. For Parties that decide to report indirect CO<sub>2</sub> emissions, the national totals shall be presented with and without indirect CO<sub>2</sub> emissions.

17. In comparison with the previous reporting guidelines, there are several new GHGs included, namely NF<sub>3</sub> and additional chemical compounds such as HFCs and PFCs which occur solely in the industrial processes and solvent and other product use sector (see annex II to this paper for detailed information). In addition, indirect CO<sub>2</sub> emissions from the atmospheric oxidation of CH<sub>4</sub>, CO and NMVOCs has been introduced as a non-mandatory reporting requirement.

### C. Inclusion of new categories

18. The revised CRF tables, as presented in annex II to decision 24/CP.19,<sup>5</sup> contain several changes with regard to the inclusion of new categories, namely:

- (a) **In the energy sector:** CRF table 1.C – CO<sub>2</sub> transport and storage;
- (b) **In the industrial processes and solvent and other product use sector:** CRF table 2(I).D – non-energy products from fuels and solvent use; CRF table 2(I).E – electronics industry; CRF table 2(I).F – product uses as substitutes for ODS (ozone-depleting substances); and CRF table 2(I).G – other product manufacture and use;
- (c) **In the agriculture sector:** CRF table 3.G – liming; CRF table 3.H – urea application; and CRF table 3.I – other carbon-containing fertilizers;
- (d) **In the LULUCF sector:** CRF table 4.G – harvested wood products;
- (e) **In the waste sector:** CRF table 5.B – biological treatment of solid waste; CRF table 5.C – incineration and open burning of waste; and CRF table 5.D – wastewater treatment and discharge.

### D. Enhanced reporting on national inventory arrangements

19. The previous updated reporting guidelines contain a provision specifying that the national inventory report should include a description of the institutional arrangements for inventory preparation (see para. 41(i) of the comparison table presented in annex I to this paper) without any further elaboration on the specific content of this information.

20. The latest revised reporting guidelines have introduced an entire section on the national inventory arrangements with detailed provisions on the general and specific functions of the national inventory arrangements (see section F of the comparison table presented in annex I to this paper), namely:

- (a) Inventory planning;
- (b) Inventory preparation;
- (c) Inventory management.

21. The UNFCCC reporting guidelines on BRs require that BRs contain summary information on the national inventory arrangements in accordance with the related reporting requirements contained in the UNFCCC Annex I inventory reporting guidelines, and on the changes to these national inventory arrangements since the last NC or BR.

22. It is evident that, as a result of the new mandatory reporting elements introduced in the latest revised reporting guidelines, more detailed information on the national inventory arrangements and changes to these arrangements should be expected in the BR2s in comparison with the BR1s.

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<sup>5</sup> Owing to the complexity and importance of colour coding in the CRF tables, they have not been included in this document, but can be downloaded from the UNFCCC website at <[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/reporting\\_requirements/items/5333.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/5333.php)>.

## IV. Implications of the changes on greenhouse gas emission levels and trends and on the description of the quantified economy-wide emission reduction target

### A. Implications on greenhouse gas emission levels and trends

23. In order to illustrate the effects of the changes in the UNFCCC Annex I inventory reporting guidelines on GHG emissions levels and trends, four selected examples, namely, Australia, European Union, New Zealand and Russian Federation, are provided below based on the GHG CRF tables submitted in 2014 and 2015. The following information was analysed:

- (a) Total CO<sub>2</sub> eq emissions without LULUCF;
- (b) Total CO<sub>2</sub> eq emissions with LULUCF;
- (c) Shares of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions;
- (d) Whether emissions of NF<sub>3</sub> were reported.

24. In this regard, two inventory years were selected for comparison: 1990 (the starting year in the time series); and 2012 (the latest year in the time series which captures the changes between the reporting guidelines). The results are presented in the tables below.

Table 1. The comparison of the information from the CRF tables submitted by Australia in 2014 and 2015 (inventory years 1990 and 2012)

Australia	1990			2012		
	CRF tables 2014	CRF tables 2015	Change (%)	CRF tables 2014	CRF tables 2015	Change (%)
Total CO <sub>2</sub> eq without LULUCF, Gg	414 974	428 291	+3.2	543 648	549 756	+1.1
Total CO <sub>2</sub> eq with LULUCF (Gg)	545 495	531 592	-2.5	558 809	544 676	-2.5
Share of CO <sub>2</sub> (%)	66.5	65.0	-2.4	73.2	73.8	+0.9
Share of CH <sub>4</sub> (%)	27.8	29.6	+6.8	20.6	20.2	-1.5
Share of N <sub>2</sub> O (%)	4.4	3.9	-10.6	4.7	4.2	-12.0
NF <sub>3</sub> reported	-	-	-	-	NO	-

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**Table 2. The comparison of the information from the CRF tables submitted by the European Union in 2014 and 2015 (inventory years 1990 and 2012)**

European Union (28)	1990			2012		
	CRF tables 2014	CRF tables 2015	Change (%)	CRF tables 2014	CRF tables 2015	Change (%)
Total CO <sub>2</sub> eq without LULUCF, Gg	5 626 260	5 680 150	+1.0	4 544 224	4 562 704	+0.4
Total CO <sub>2</sub> eq with LULUCF, Gg	5 367 940	5 420 569	+1.0	4 240 671	4 250 375	+0.2
Share of CO <sub>2</sub> (%)	78.9	78.5	-0.4	81.8	81.7	-0.1
Share of CH <sub>4</sub> (%)	10.7	13.1	+22.5	8.8	10.4	+18.6
Share of N <sub>2</sub> O (%)	9.4	7.1	-24.0	7.3	5.5	-25.5
NF <sub>3</sub> reported	-	-	-	-	Yes	-

**Table 3. The comparison of the information from the CRF tables submitted by New Zealand in 2014 and 2015 (inventory years 1990 and 2012)**

New Zealand	1990			2012		
	CRF tables 2014	CRF tables 2015	Change (%)	CRF tables 2014	CRF tables 2015	Change (%)
Total CO <sub>2</sub> eq without LULUCF, Gg	60 641	66 720	+10.0	76 048	82 078	+7.9
Total CO <sub>2</sub> eq with LULUCF, Gg	23 391	38 066	+62.7	49 450	54 229	+9.7
Share of CO <sub>2</sub> (%)	41.1	38.1	-7.4	45.1	43.4	-3.7
Share of CH <sub>4</sub> (%)	44.3	49.9	+12.8	38.2	43.6	+14.2
Share of N <sub>2</sub> O (%)	13.5	10.9	-19.2	14.3	11.0	-22.6
NF <sub>3</sub> reported	-	-	-	-	NA	-



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**Table 4. The comparison of the information from the CRF tables submitted by the Russian Federation in 2014 and 2015 (inventory years 1990 and 2012)**

Russian Federation	1990			2012		
	CRF tables 2014	CRF tables 2015	Change (%)	CRF tables 2014	CRF tables 2015	Change (%)
Total CO <sub>2</sub> eq without LULUCF, Gg	3 367 781	3 941 300	+17.0	2 297 152	2 862 272	+24.6
Total CO <sub>2</sub> eq with LULUCF, Gg	3 532 352	4 141 923	+17.3	1 755 135	2 423 176	+38.1
Share of CO <sub>2</sub> (%)	74.5	65.7	-11.8	72.2	60.4	-16.4
Share of CH <sub>4</sub> (%)	17.6	28.3	+60.7	21.9	35.5	+62.4
Share of N <sub>2</sub> O (%)	6.6	4.7	-29.9	5.05	3.3	-34.5
NF <sub>3</sub> reported	-	-	-	-	NO	-

*Abbreviations:*

CRF = common reporting format

LULUCF = land use, land-use change and forestry

NA = not applicable

NO = not occurring

25. Although the analysis did not cover all 44 Annex I Parties, the examples provided in the tables above show that in almost all cases total GHG emissions (both with and without LULUCF) in 1990 and 2012 increased from less than 1 per cent to more than 62 per cent (in the case of Australia only, total emissions with LULUCF decreased). It could reasonably be assumed that one of the main factors which caused the increase in GHG emissions is the new GWP values for CH<sub>4</sub> and N<sub>2</sub>O.

26. This is also reflected in the changes in the shares of GHGs; in all cases the share of CH<sub>4</sub> increased and the share of N<sub>2</sub>O decreased in the 2015 submission. In total, CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions still represent more than 98 per cent of total GHG emissions, which means that the contribution of other GHGs, including the new ones, is not significant for the observed years.

**B. Implications on the description of the quantified economy-wide emission reduction target**

27. Another important section reported in the BR2s which could potentially be influenced by changes in the UNFCCC Annex I inventory reporting guidelines is the description of the quantified economy-wide emission reduction target.

28. Arguably, Annex I Parties might wish to recalculate their emission reduction target described in the previously submitted biennial report (i.e. the BR1) if the key parameters used for the estimation of GHG emissions (e.g. GWP values, categories or gases) are updated or revised in such a way that the impact on the aggregate GHG emissions level in the base year and the latest inventory year is disproportional (e.g. a lower increase in emissions in the base year and a higher increase in the latest year of the time series or vice versa).<sup>6</sup>

29. For that purpose, all reporting elements under the BR section “Description of the quantified economy-wide emission reduction target” were compared using the BR1 and BR2 submissions. Specifically, information provided in the BR common tabular format (CTF) tables 2(a), 2(b), 2(c), 2(d) and 2(e) was extracted and analysed.

30. The results of this analysis are presented in annex III to this paper and provide an insight into the changes that occurred between the BR1 and BR2 submissions in relation to the emission reduction targets. Out of the 32 BR2s that were submitted to the UNFCCC secretariat at the time when the analysis was performed, only 4 Annex I Parties updated the information on the emission reduction target as reported in CTF table 2(a). Of these four cases, two were related to the correction of the target reported in the BR1, although the target remained the same (cases of Bulgaria and Romania, both of which are European Union (EU) member States), and two were related to an actual change of the target, but were not associated with the changes in the UNFCCC Annex I inventory reporting guidelines (cases of Belarus and Poland).

31. With regard to the gases and sectors covered (BR CTF table 2 (b)), it is evident that there are a significant number of changes to the information related to the base year for the newly introduced gas NF<sub>3</sub>, which in many cases was not reported or is yet to be determined. This could suggest that the national inventory agencies are still collecting reliable activity data necessary for the estimation of NF<sub>3</sub> emissions and, at this point, are not in a position to determine the emissions in the base year.

## **V. Conclusions and recommendations**

32. According to the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”,<sup>7</sup> the technical review of the BR2s, which is in part related to GHG emissions and trends, will examine the consistency of the BR with the annual GHG inventory and NC but will not include an in-depth examination of the inventory itself or a comparison of the GHG emissions and trends in the BR2 with the previously reported information in the BR1. However, it is important for the ERTs to be aware of the methodological changes applied in the 2015 GHG inventory submission. The ERTs will qualitatively assess the GHG emissions and emission trends and the extent to which they have been influenced by national circumstances, implemented policies and measures, and other relevant factors.

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<sup>6</sup> It is important to emphasize that this particular case should not be confused with a potential overestimation of GHG emissions in the base year and an underestimation in the latest inventory year.

<sup>7</sup> Decision 13/CP.20.

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33. It is assumed that changes in the methodology, activity data, emission factors and GWP values will be accurately, completely and consistently applied for the estimation of GHG emissions and removals throughout the entire time series (1990–2013) and reflected as such in the annual GHG inventory report submissions and BR2s.

34. More substantial information is expected in the BR2s on national inventory arrangements and changes to these arrangements, which became a mandatory reporting element from 2015. The scope of reporting almost completely replicates the requirements for national systems under the Kyoto Protocol (Annex to decision 19/CMP.1, para. 1-18).

35. It is evident from the examples provided above that the increase in the total GHG emission levels stemming from the use of the 2006 IPCC Guidelines across the past years is not linear; for three of the Parties used in the case study, the increase in emissions is higher in 1990 (base year) than in 2012. This depends to a large extent on the use of the updated GWP values and shares of CH<sub>4</sub> and N<sub>2</sub>O in 1990 and in subsequent years of the time series.

36. There is no evidence that changes in the UNFCCC Annex I inventory reporting guidelines had implication on description of quantified economy-wide emission reduction target for observed 32 Annex I Parties' second biennial reports.

## Annex I

### Detailed comparison of the previous and new UNFCCC Annex I inventory reporting guidelines

Table 1. Detailed comparison of the previous and new UNFCCC Annex I inventory reporting guidelines

Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous	Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new
<b>A. Objectives</b>	<b>A. Objectives</b>
<p>1. The objectives of the UNFCCC reporting guidelines on annual inventories are:</p> <p>(a) To assist Parties included in Annex I to the Convention (Annex I Parties) in meeting their commitments under Articles 4 and 12 of the Convention and to assist Annex I Parties to the Kyoto Protocol in preparing to meet commitments under Articles 3, 5 and 7 of the Kyoto Protocol;</p> <p>(b) To facilitate the process of considering annual national inventories, including the preparation of technical analysis and synthesis documentation;</p> <p>(c) To facilitate the process of verification, technical assessment and expert review of the inventory information.</p>	<p>1. The “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” (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines) cover the estimation and reporting of anthropogenic greenhouse gas (GHG) emissions and removals in both annual GHG inventories and inventories included in national communications, as specified by decision 11/CP.4 and other relevant decisions of the COP.</p> <p>2. The objectives of the UNFCCC Annex I inventory reporting guidelines are:</p> <p>(a) To assist Parties included in Annex I to the Convention (Annex I Parties) in meeting their commitments under Articles 4 and 12 of the Convention;</p> <p>(b) To contribute to ensuring the transparency of emission reduction commitments;</p> <p>(c) To facilitate the process of considering annual national inventories, including the preparation of technical analysis and synthesis documentation;</p> <p>(d) To facilitate the process of verification, technical assessment and expert review of the inventory information;</p> <p>(e) To assist Annex I Parties in ensuring and/or improving the quality of their annual GHG inventory submissions.</p>

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<p align="center"><b>Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous</b></p>	<p align="center"><b>Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new</b></p>
<p><b>B. Principles and definitions</b></p>	<p><b>B. Principles and definitions</b></p>
<p>2. National greenhouse gas inventories, referred to below only as inventories, should be transparent, consistent, comparable, complete and accurate.</p>	<p>3. The <i>annual GHG inventory</i> should be transparent, consistent, comparable, complete and accurate.</p>
<p>3. Inventories should be prepared using comparable methodologies agreed upon by the Conference of the Parties (COP), as indicated in paragraph 9 below.</p>	<p align="center">-</p>
<p>4. In the context of these UNFCCC reporting guidelines on annual inventories:</p>	<p>4. In the context of these UNFCCC Annex I inventory reporting guidelines:</p>
<p><i>Transparency</i> means that the assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information. The transparency of inventories is fundamental to the success of the process for the communication and consideration of information;</p>	<p>(a) <i>Transparency</i> means that the <i>data sources</i>, assumptions and methodologies used for an inventory should be clearly explained, in order to facilitate the replication and assessment of the inventory by users of the reported information. The transparency of inventories is fundamental to the success of the process for the communication and consideration of the information. <i>The use of the common reporting format (CRF) tables and the preparation of a structured national inventory report (NIR) contribute to the transparency of the information and facilitate national and international reviews;</i></p>
<p><i>Consistency</i> means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. Under certain circumstances referred to in paragraphs 15 and 16, an inventory using different methodologies for different years can be considered to be consistent if it has been recalculated in a transparent manner, in accordance with the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and Good Practice Guidance for Land Use, Land-Use Change and Forestry;</p>	<p>(b) <i>Consistency</i> means that an annual GHG inventory should be internally consistent for all reported years in all its elements across sectors, categories and gases. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. Under certain circumstances referred to in paragraphs 16 to 18 below, an inventory using different methodologies for different years can be considered to be consistent if it has been recalculated in a transparent manner, in accordance with the <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as the 2006 IPCC Guidelines);</i></p>

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<p align="center"><b>Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous</b></p>	<p align="center"><b>Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new</b></p>
<p><i>Comparability</i> means that estimates of emissions and removals reported by Annex I Parties in inventories should be comparable among Annex I Parties. For this purpose, Annex I Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories. The allocation of different source/sink categories should follow the split of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories,<sup>2</sup> and the IPCC Good Practice Guidance for Land Use, Land- use Change and Forestry, at the level of its summary and sectoral tables;</p>	<p>(c) <i>Comparability</i> means that estimates of emissions and removals reported by Annex I Parties in their inventories should be comparable among Annex I Parties. For that purpose, Annex I Parties should use the methodologies and formats agreed by the COP for making estimations and reporting their inventories. The allocation of different source/sink categories should follow the CRF tables provided in annex II to decision 24/CP.19 at the level of the summary and sectoral tables;</p>
<p><i>Completeness</i> means that an inventory covers all sources and sinks, as well as all gases, included in the IPCC Guidelines as well as other existing relevant source/sink categories which are specific to individual Annex I Parties and, therefore, may not be included in the IPCC Guidelines. Completeness also means full geographic coverage of sources and sinks of an Annex I Party;</p>	<p>(d) <i>Completeness</i> means that an annual GHG inventory covers at least all sources and sinks, as well as all gases, for which methodologies are provided in the <i>2006 IPCC Guidelines or for which supplementary methodologies have been agreed by the COP</i>. Completeness also means the full geographical coverage of the sources and sinks of an Annex I Party;</p>
<p><i>Accuracy</i> is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable. Appropriate methodologies should be used, in accordance with the IPCC good practice guidance, to promote <i>accuracy</i> in inventories.</p>	<p>(e) <i>Accuracy</i> means that emission and removal estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable. Appropriate methodologies should be used, in accordance with the <i>2006 IPCC Guidelines</i>, to promote accuracy in inventories.</p>
<p>5. In the context of these guidelines, definitions of common terms used in greenhouse gas inventory preparation are those provided in the IPCC good practice guidance.</p>	<p>5. In the context of these reporting guidelines, the definitions of common terms used in GHG inventory preparation are those provided in the <i>2006 IPCC Guidelines</i>.</p>
<p><b>C. Context</b></p>	<p><b>C. Context</b></p>
<p>6. These UNFCCC reporting guidelines on annual inventories cover the estimation and reporting of greenhouse gas emissions and removals in both annual inventories and inventories included in national communications, as specified by decision 11/CP.4 and other relevant decisions of the COP. (see Para 1.</p>	<p>6. <i>The UNFCCC Annex I inventory reporting guidelines also cover the establishment and maintenance of national inventory arrangements for the purpose of the continued preparation of timely, complete, consistent, comparable, accurate and transparent annual GHG inventories.</i></p>

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24/CP.19)	
<p>7. An annual inventory submission shall consist of a national inventory report (NIR) and the common reporting format (CRF) tables, as described in paragraphs 38 through 43 and 44 through 50, respectively.</p>	<p>7. An annual GHG inventory submission shall consist of an NIR and the CRF tables, <i>as set out in annexes I and II to decision 24/CP.19. The annual submission also comprises information provided by an Annex I Party in addition to its submitted NIR and CRF tables.</i></p>
<p><b>D. Base year</b></p>	<p><b>D. Base year</b></p>
<p>8. The year 1990 should be the base year for the estimation and reporting of inventories. According to the provisions of Article 4, paragraph 6 of the Convention and decisions 9/CP.2 and 11/CP.4, the following Annex I Parties that are undergoing the process of transition to a market economy are allowed to use a base year or a period of years other than 1990, as follows:</p> <p>Bulgaria: 1988 Hungary: the average of the years 1985 to 1987 Poland: 1988 Romania: 1989 Slovenia: 1986</p>	<p>8. The year 1990 should be the base year for the estimation and reporting of inventories. According to the provisions of Article 4, paragraph 6, of the Convention and decisions 9/CP.2, 11/CP.4 <i>and 7/CP.12</i>, the following Annex I Parties that are undergoing the process of transition to a market economy are allowed to use a base year or a period of years other than 1990, or a level of emissions as established by a decision of the COP, as follows:</p> <p>Bulgaria: 1988 <i>Croatia: 1990</i> Hungary: the average of the years 1985 to 1987 Poland: 1988 Romania: 1989 Slovenia 1986</p>
<p><b>E. Methods</b></p>	<p><b>E. Methods</b></p>
<p><u>Methodology</u></p>	<p><u>Methodology</u></p>
<p>9. Annex I Parties shall use the IPCC Guidelines to estimate and report on anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol. In preparing national inventories of these gases, Annex I Parties shall also use the IPCC good practice guidance in order to improve transparency, consistency, comparability, completeness and accuracy.</p>	<p>9. Annex I Parties shall use <i>the methodologies provided in the 2006 IPCC Guidelines, unless stated otherwise in the UNFCCC Annex I inventory reporting guidelines, and any supplementary methodologies agreed by the COP, and other relevant COP decisions to estimate anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol.</i></p>
<p>10. In accordance with the IPCC Guidelines, Annex I Parties may use different methods (tiers) included in those guidelines, giving priority to</p>	<p>10. Annex I Parties may use different methods (tiers) contained in the 2006 IPCC Guidelines, prioritizing these methods in accordance with the 2006 IPCC</p>

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<p>those methods which, according to the decision trees in the IPCC good practice guidance, produce more accurate estimates. In accordance with the IPCC Guidelines, Annex I Parties may also use national methodologies which they consider better able to reflect their national situation, provided that these methodologies are compatible with the IPCC Guidelines and IPCC good practice guidance and are well documented and scientifically based.</p>	<p>Guidelines. Annex I Parties may also use national methodologies which they consider better able to reflect their national situation, provided that these methodologies are compatible with the <i>2006 IPCC Guidelines</i> and are well documented and scientifically based.</p>
<p>11. For categories that are determined to be key categories, in accordance with IPCC good practice guidance, and estimated in accordance with the provisions in paragraph 13 below, Annex I Parties should make every effort to use a recommended method, in accordance with the corresponding decision trees of the IPCC good practice guidance. Annex I Parties should also make every effort to develop and/or select emission factors, and collect and select activity data, in accordance with the IPCC good practice guidance.</p>	<p>11. For categories that are determined to be key categories, in accordance with the <i>2006 IPCC Guidelines</i>, and estimated in accordance with the provisions in paragraph 14 below, Annex I Parties should make every effort to use a recommended method, in accordance with the corresponding decision trees in the <i>2006 IPCC Guidelines</i>. Annex I Parties should also make every effort to develop and/or select emission factors (EFs), and collect and select activity data (AD), in accordance with IPCC good practice. <i>Where national circumstances prohibit the use of a recommended method, then the Annex I Party shall explain in its annual GHG inventory submission the reason(s) as to why it was unable to implement a recommended method in accordance with the decision trees in the 2006 IPCC Guidelines.</i></p>
<p>12. For most categories, the IPCC Guidelines provide a default methodology which includes default emission factors and in some cases default activity data references. Furthermore, the IPCC good practice guidance provides updated default emission factors and default activity data for some categories and gases. As the assumptions implicit in these default data, factors and methods may not be appropriate for specific national contexts, it is preferable for Annex I Parties to use their own national emission factors and activity data, where available, provided that they are developed in a manner consistent with the IPCC good practice guidance, are considered to be more accurate, and reported transparently. The updated default activity data or emission factors provided in the IPCC good practice guidance should be used, where available, if Annex I Parties choose to use default factors or data due to lack of country-specific information.</p>	<p>12. The <i>2006 IPCC Guidelines</i> provide default methodologies which include default EFs and in some cases default AD for the categories to be reported. As the assumptions implicit in these default data, factors and methods may not be appropriate for specific national circumstances, Annex I Parties should use their own national EFs and AD, where available, provided that they are developed in a manner consistent with the 2006 IPCC Guidelines and are considered to be more accurate than the defaults. If Annex I Parties lack country-specific information, they could also use EFs or other parameters provided in the <i>IPCC Emission Factor Database</i>, where available, provided that they can demonstrate that those parameters are appropriate in the specific national circumstances and are more accurate than the default data provided in the 2006 IPCC Guidelines. Annex I Parties shall transparently explain in their annual GHG inventory submissions what data and/or parameters have been used.</p>



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-	<p><i>13. Parties are encouraged to refine estimates of anthropogenic emissions and removals in the land use, land-use change and forestry (LULUCF) sector through the application of tier 3 methods, provided that they are developed in a manner consistent with the 2006 IPCC Guidelines, and information for transparency is provided in accordance with paragraph 50(a) below.</i></p>
<p><u>Key category determination</u></p>	<p><u>Key category identification</u></p>
<p>13. Annex I Parties shall identify their national key categories for the base year and the latest reported inventory year, as described in the IPCC good practice guidance, using the tier 1 or tier 2 level and trend assessment.</p>	<p>14. Annex I Parties shall identify their key categories for the base year and the latest reported inventory year, <i>using approach 1</i>, level and trend assessment, including and excluding LULUCF. <i>Parties are encouraged to also use approach 2 and to add additional key categories to the result of approach 1.</i></p>
<p><u>Uncertainties</u></p>	<p><u>Uncertainties</u></p>
<p>14. Annex I Parties shall quantitatively estimate the uncertainties in the data used for all source and sink categories using at least the tier 1 method, as provided in the IPCC good practice guidance. Alternatively, Annex I Parties may use the tier 2 method in the IPCC good practice guidance to address technical limitations in the tier 1 method. Uncertainty in the data used for all source and sink categories should also be qualitatively discussed in a transparent manner in the NIR, in particular for categories that were identified as key categories.</p>	<p>15. Annex I Parties shall quantitatively estimate the uncertainty of the data used for all source and sink categories using at least <i>approach 1</i>, as provided in the 2006 IPCC Guidelines, and report uncertainties for at least the base year and the latest inventory year and the trend uncertainty between these two years. Annex I Parties are encouraged to use approach 2 or a hybrid of approaches 1 and 2 provided in the 2006 IPCC Guidelines, in order to address technical limitations of approach 1. The uncertainty of the data used for all source and sink categories should also be qualitatively discussed in a transparent manner in the NIR, in particular for categories that were identified as key categories.</p>
<p><u>Recalculations</u></p>	<p><u>Recalculations and time-series consistency</u></p>
<p>15. The inventories of an entire time series, including the base year and all subsequent years for which inventories have been reported, should be estimated using the same methodologies, and the underlying activity data and emission factors should be obtained and used in a consistent manner. Recalculations should ensure</p>	<p>16. The inventory for a time series, including the base year and all subsequent years for which the inventory has been reported, should be estimated using the same methodologies, and the underlying AD and EFs should be obtained and used in a consistent manner, <i>ensuring that changes in emission trends are not introduced as a result of changes in estimation methods or assumptions</i></p>

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<p>consistency of the time series and shall be carried out only to improve accuracy and/or completeness. Where the methodology or manner in which underlying activity data and emission factors are gathered has changed, Annex I Parties should recalculate inventories for the base and subsequent years. Annex I Parties should evaluate the need for recalculations relative to the reasons provided by the IPCC good practice guidance, in particular for key categories. Recalculations should be performed in accordance with IPCC good practice guidance and the general principles set down in these UNFCCC guidelines.</p>	<p><i>over the time series of estimates.</i></p> <p>17. Recalculations should ensure the consistency of the time series and shall be carried out to improve accuracy and/or completeness. Where the methodology or manner in which underlying AD and EFs are gathered has changed, Annex I Parties should recalculate their inventories for the base year and subsequent years of the times series. Annex I Parties should evaluate the need for recalculations relative to the reasons provided in the <i>2006 IPCC Guidelines</i>, in particular for key categories. Recalculations should be performed in accordance with <i>2006 IPCC Guidelines</i> and the general principles set down in these reporting guidelines.</p>
<p>16. In some cases it may not be possible to use the same methods and consistent data sets for all years due to a possible lack of activity data, emission factors or other parameters directly used in the calculation of emission estimates for some historical years, including the base year. In such cases, emissions or removals may need to be recalculated using alternative methods not generally covered by paragraphs 9 through 12. In these instances, Annex I Parties should use one of the techniques provided by the IPCC good practice guidance (e.g., overlap, surrogate, interpolation, and extrapolation) to determine the missing values. Annex I Parties should document and demonstrate in the NIR that the time series is consistent, wherever such techniques are used.</p>	<p>18. In some cases it may not be possible to use the same methods and consistent data sets for all years, owing to a possible lack of AD, EFs or other parameters directly used in the calculation of emission estimates for some historical years, including the base year. In such cases, emissions or removals may need to be recalculated using alternative methods not generally covered by paragraph 9 above. In these instances, Annex I Parties should use one of the techniques provided in the <i>2006 IPCC Guidelines</i> to estimate the missing values. Annex I Parties should document and report the methodologies used for the entire time series.</p>
<p><u>Quality assurance/quality control (QA/QC)</u></p>	<p><u>Quality assurance/quality control</u></p>
<p>17. Each Annex I Party shall elaborate an inventory QA/QC plan and implement general inventory QC procedures (tier 1)<sup>5</sup> in accordance with its QA/QC plan following the IPCC good practice guidance. In addition, Annex I Parties should apply category-specific QC procedures (tier 2) for key categories and for those individual categories in which significant methodological changes and/or data revisions have occurred, in accordance with IPCC good practice guidance. The implementation of tier 2</p>	<p>19. Each Annex I Party shall elaborate an inventory quality assurance/quality control (QA/QC) plan and implement general inventory QC procedures in accordance with its QA/QC plan following the 2006 IPCC Guidelines. In addition, Annex I Parties should apply category-specific QC procedures for key categories and for those individual categories in which significant methodological changes and/or data revisions have occurred, in accordance with the 2006 IPCC Guidelines. In addition, Annex I Parties should implement QA procedures by conducting a basic expert</p>

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<p>QC may be more efficiently implemented in conjunction with the evaluation of uncertainties in data sources. In addition, Annex I Parties should implement QA procedures by conducting a basic expert peer review (tier 1 QA) of their inventories in accordance with IPCC good practice guidance.</p>	<p>peer review of their inventories in accordance with the 2006 IPCC Guidelines.</p>
<p align="center">-</p>	<p align="center"><b><i>F. National inventory arrangements</i></b></p>
<p align="center">-</p>	<p><i>20. Each Annex I Party should implement and maintain national inventory arrangements for the estimation of anthropogenic GHG emissions by sources and removals by sinks. The national inventory arrangements include all institutional, legal and procedural arrangements made within an Annex I Party for estimating anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol, and for reporting and archiving inventory information.</i></p>
<p align="center">-</p>	<p><i>21. National inventory arrangements should be designed and operated:</i></p> <p><i>(a) To ensure the transparency, consistency, comparability, completeness and accuracy of inventories, as defined in paragraphs 3 and 4 above;</i></p> <p><i>(b) To ensure the quality of inventories through the planning, preparation and management of inventory activities. Inventory activities include collecting AD, selecting methods and EFs appropriately, estimating anthropogenic GHG emissions by sources and removals by sinks, implementing uncertainty assessment and QA/QC activities, and carrying out procedures for the verification of the inventory data at the national level, as described in these reporting guidelines.</i></p>
	<p><i>22. In the implementation of its national inventory arrangements, each Annex I Party should perform the following general functions:</i></p> <p><i>(a) Establish and maintain the institutional, legal and</i></p>

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	<p><i>procedural arrangements necessary to perform the functions defined in paragraphs 23 to 27 below, as appropriate, between the government agencies and other entities responsible for the performance of all functions defined in these reporting guidelines;</i></p> <p><i>(b) Ensure sufficient capacity for the timely performance of the functions defined in these reporting guidelines, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for the technical competence of the staff involved in the inventory development process;</i></p> <p><i>(c) Designate a single national entity with overall responsibility for the national inventory;</i></p> <p><i>(d) Prepare national annual GHG inventories in a timely manner in accordance with these reporting guidelines and relevant decisions of the COP, and provide the information necessary to meet the reporting requirements defined in these reporting guidelines and in relevant decisions of the COP;</i></p> <p><i>(e) Undertake specific functions relating to inventory planning, preparation and management.</i></p>
-	<p><u><i>Inventory planning</i></u></p>
-	<p><i>23. As part of its inventory planning, each Annex I Party should:</i></p> <p><i>(a) Define and allocate specific responsibilities in the inventory development process, including those relating to choosing methods, data collection, particularly AD and EFs from statistical services and other entities, processing and archiving, and QA/QC. Such definition should specify the roles of, and the cooperation between, government agencies and other entities involved in the preparation of the inventory, as well as the institutional, legal and procedural arrangements made to prepare the inventory;</i></p>

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	<p><i>(b) Elaborate an inventory QA/QC plan as indicated in paragraph 19 above;</i></p> <p><i>(c) Establish processes for the official consideration and approval of the inventory, including any recalculations, prior to its submission, and for responding to any issues raised in the inventory review process.</i></p>
<p align="center">-</p>	<p><i>24. As part of its inventory planning, each Annex I Party should consider ways to improve the quality of AD, EFs, methods and other relevant technical elements of the inventory. Information obtained from the implementation of the QA/QC programme, the inventory review process and other verification activities should be considered in the development and/or revision of the QA/QC plan and the quality objectives.</i></p>
<p align="center">-</p>	<p><i><u>Inventory preparation</u></i></p>
<p align="center">-</p>	<p><i>25. As part of its inventory preparation, each Annex I Party should:</i></p> <p><i>(a) Prepare estimates in accordance with the requirements defined in these reporting guidelines;</i></p> <p><i>(b) Collect sufficient AD, process information and EFs as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks;</i></p> <p><i>(c) Make quantitative estimates of uncertainty for each category and for the inventory as a whole, as indicated in paragraph 15 above;</i></p> <p><i>(d) Ensure that any recalculations are prepared in accordance with paragraphs 16–18 above;</i></p>

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	<p><i>(e) Compile the NIR and the CRF tables in accordance with these reporting guidelines;</i></p> <p><i>(f) Implement general inventory QC procedures in accordance with its QA/QC plan, following the 2006 IPCC Guidelines.</i></p>
-	<p><i>26. As part of its inventory preparation, each Annex I Party should:</i></p> <p><i>(a) Apply category-specific QC procedures for key categories and for those individual categories in which significant methodological and/or data revisions have occurred, in accordance with the 2006 IPCC Guidelines;</i></p> <p><i>(b) Provide for a basic review of the inventory by personnel that have not been involved in the inventory development process, preferably an independent third party, before the submission of the inventory, in accordance with the planned QA procedures referred to in paragraph 19 above;</i></p> <p><i>(c) Provide for a more extensive review of the inventory for key categories, as well as for categories where significant changes to methods or data have been made, in accordance with the 2006 IPCC Guidelines;</i></p> <p><i>(d) On the basis of the reviews described in paragraph 26(b) and (c) above and periodic internal evaluations of the inventory preparation process, re-evaluate the inventory planning process, in order to meet the established quality objectives referred to in paragraph 24 above.</i></p>
-	<p><u><i>Inventory management</i></u></p>
-	<p><i>27. As part of its inventory management, each Annex I Party should:</i></p> <p><i>(a) Archive all relevant inventory information for the reported time series, including all disaggregated EFs</i></p>

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	<p><i>and AD, documentation on how these factors and data have been generated and aggregated for the preparation of the inventory, internal documentation on QA/QC procedures, external and internal reviews, and documentation on annual key categories and key category identification and planned inventory improvements;</i></p> <p><i>(b) Provide review teams with access to all archived information used by the Party to prepare the inventory through the single national entity, in accordance with relevant decisions of the COP;</i></p> <p><i>(c) Respond, in a timely manner, to requests for clarifying inventory information resulting from the different stages of the process of review of the inventory information and information on the national inventory arrangements.</i></p>
<p><b>F. Reporting</b></p>	<p><b>G. Reporting</b></p>
<p>1. <u>General guidance</u></p>	<p>1. General guidance</p>
<p><u>Estimates of emissions and removals</u></p>	<p><u>Estimates of emissions and removals</u></p>
<p>18. Article 12.1(a) of the Convention requires that each Party shall communicate to the COP, through the secretariat, inter alia, a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. As a minimum requirement, inventories shall contain information on the following greenhouse gases: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>).</p>	<p>28. Article 12, paragraph 1(a), of the Convention requires that each Party shall communicate to the COP, through the secretariat, inter alia, a national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol. As a minimum requirement, inventories shall contain information on the following GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>).</p>
<p>Annex I Parties should report anthropogenic emissions and removals of any other greenhouse gases whose 100-year global warming potential (GWP) values have been identified by the IPCC and adopted by the COP. (see Para 31. 24/CP.19)</p>	<p>29. In addition, Annex I Parties should provide information on the following precursor gases: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>) and non-methane volatile organic compounds (NMVOCs), as well as sulphur oxides (SO<sub>x</sub>).</p>

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<p>Annex I Parties should also provide information on the following indirect greenhouse gases: carbon monoxide (CO), nitrogen oxides (NOX) and non-methane volatile organic compounds (NMVOCs), as well as sulphur oxides (SOx).</p>	
<p align="center">-</p>	<p><i>Annex I Parties may report indirect CO<sub>2</sub> from the atmospheric oxidation of CH<sub>4</sub>, CO and NMVOCs. Annex I Parties may report as a memo item indirect N<sub>2</sub>O emissions from other than the agriculture and LULUCF sources. These estimates of indirect N<sub>2</sub>O should not be included in national totals. For Parties that decide to report indirect CO<sub>2</sub> the national totals shall be presented with and without indirect CO<sub>2</sub>.</i></p>
<p>19. Greenhouse gas emissions and removals should be presented on a gas-by-gas basis in units of mass with emissions by sources listed separately from removals by sinks, except in cases where it may be technically impossible to separate information on sources and sinks in the areas of land use, land-use change and forestry. For HFCs and PFCs, emissions should be reported for each relevant chemical in the category on a disaggregated basis, except in cases where paragraph 27 below applies.</p>	<p>30. GHG emissions and removals should be presented on a gas-by-gas basis in units of mass, with emissions by sources listed separately from removals by sinks, except in cases where it may be technically impossible to separate information on sources and sinks in the area of LULUCF. For HFCs and PFCs, emissions should be reported for each relevant chemical in the category on a disaggregated basis, except in cases where paragraph 36 below applies.</p>
<p>20. In addition, consistent with decision 2/CP.3, Annex I Parties should report aggregate emissions and removals of greenhouse gases, expressed in CO<sub>2</sub> equivalent terms at summary inventory level, using GWP values provided by the IPCC in its Second Assessment Report, referred to below as 1995 IPCC GWP values, based on the effects of greenhouse gases over a 100-year time horizon. A list of these values is given in table 1 at the end of these guidelines. Table 1 on page 15 will be amended to include any additional greenhouse gases and their 100-year GWP values, once the GWP values have been adopted by the COP.</p>	<p><i>31. Annex I Parties should report aggregate emissions and removals of GHGs, expressed in CO<sub>2</sub> equivalent (CO<sub>2</sub> eq), using the global warming potential values as agreed by decision 24/CP.19 or any subsequent decision by the COP on global warming potentials.</i></p>
<p>21. Consistent with decision 2/CP.3, Annex I Parties should report actual emissions of HFCs, PFCs and SF<sub>6</sub>, where data are available, providing disaggregated data by chemical (for example, HFC-134a) and source category in units of mass and in CO<sub>2</sub> equivalents. Annex I Parties should make every effort to develop the</p>	<p>32. Annex I Parties <i>shall</i> report actual emissions of HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>, providing disaggregated data by chemical (e.g. HFC-134a) and category in units of mass and in CO<sub>2</sub> eq, except in cases where paragraph 36 below applies. Annex I Parties should report emission estimates or notation keys in line with paragraph 37 below and trends for these gases for 1990</p>



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<p>necessary sources of data for reporting actual emissions. For the source categories where the concept of potential emissions applies, and Annex I Parties do not yet have the necessary data to calculate actual emissions, Annex I Parties should report disaggregated potential emissions. Annex I Parties reporting actual emissions should also report potential emissions for the sources where the concept of potential emissions applies, for reasons of transparency and comparability.</p>	<p>onwards, in accordance with the provisions of these reporting guidelines.</p>
<p align="center">-</p>	<p><i>33. Annex I Parties are strongly encouraged to also report emissions and removals of additional GHGs, such as hydrofluoroethers (HFEs), perfluoropolyethers (PFPEs), and other gases for which 100-year global warming potential values are available from the IPCC but have not yet been adopted by the COP. These emissions and removals should be reported separately from national totals.</i></p>
<p>22. Any Annex I Party that is a Party to the Kyoto Protocol and that in accordance with Article 3, paragraph 8 of the Kyoto Protocol chooses to use 1995 as its base year for HFCs, PFCs and SF6 for the purposes of calculating assigned amounts pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, should indicate this in its NIR and in the documentation boxes of the relevant tables of the CRF. Irrespective of the base year chosen for these gases for the purpose of the Kyoto Protocol, such Annex I Parties should report, to the extent that data are available, emission estimates and trends for these gases from 1990 onward, in accordance with the provisions of these guidelines.</p>	<p align="center">-</p>
<p>23. Annex I Parties are strongly encouraged to also report emissions and removals of additional greenhouse gases for which 100-year GWP values are available, but not yet adopted by the COP. These emissions and removals should be reported separately from national totals. The GWP value and reference should be indicated. (see Para 33. 24/CP.19)</p>	<p align="center">-</p>
<p>24. In accordance with the IPCC Guidelines, international aviation and marine bunker fuel</p>	<p>34. In accordance with the 2006 IPCC Guidelines, international aviation and marine bunker fuel emissions</p>

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<p>emissions should not be included in national totals but should be reported separately. Annex I Parties should make every effort to both apply and report according to the IPCC good practice guidance method for separation between domestic and international emissions. Annex I Parties should also report emissions from international aviation and marine bunker fuels as two separate entries in their inventories.</p>	<p>should not be included in national totals but should be reported separately. Annex I Parties should make every effort to both apply and report according to the method contained in the <i>2006 IPCC Guidelines</i> for separating domestic and international emissions. Annex I Parties should also report emissions from international aviation and marine bunker fuels as two separate entries in their inventories.</p>
<p>25. Annex I Parties should clearly indicate how feedstocks and non-energy use of fuels have been accounted for in the inventory, in the energy or industrial processes sector, in accordance with the IPCC good practice guidance.</p>	<p>35. Annex I Parties should clearly indicate how feedstocks and non-energy use of fuels have been accounted for in the inventory, under the energy or industrial processes sector, in accordance with the <i>2006 IPCC Guidelines</i>.</p>
<p>26. If Annex I Parties account for effects of CO<sub>2</sub> capture from flue gases and subsequent CO<sub>2</sub> storage in their inventory, they should indicate in which source categories such effects are included, and provide transparent documentation of the methodologies used and the resulting effects.</p>	<p align="center">-</p>
<p>27. Emissions and removals should be reported at the most disaggregated level of each source/sink category, taking into account that a minimum level of aggregation may be required to protect confidential business and military information.</p>	<p>36. Emissions and removals should be reported at the most disaggregated level of each source/sink category, taking into account that a minimum level of aggregation may be required to protect confidential business and military information.</p>
<p><u>Completeness</u></p>	<p><u>Completeness</u></p>
<p>28. Where methodological or data gaps in inventories exist, information on these gaps should be presented in a transparent manner. Annex I Parties should clearly indicate the sources and sinks not considered in their inventories but which are included in the IPCC Guidelines, and explain the reasons for such exclusion. Similarly, Annex I Parties should indicate the parts of their geographical area, if any, not covered by their inventory and explain the reasons for their exclusion. In addition, Annex I Parties should use the notation keys presented below to fill in the blanks in all the tables in the CRF.<sup>7</sup> This approach facilitates assessment of the completeness of an inventory.</p>	<p>37. Where methodological or data gaps in inventories exist, information on these gaps should be presented in a transparent manner. Annex I Parties should clearly indicate the sources and sinks which are not considered in their inventories but which are included in the 2006 IPCC Guidelines, and explain the reasons for such exclusion. Similarly, Annex I Parties should indicate the parts of their geographical area, if any, not covered by their inventory and explain the reasons for their exclusion. In addition, Annex I Parties should use the notation keys presented below to fill in the blanks in all the CRF tables. This approach facilitates the assessment of the completeness of an inventory.</p>

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<p>The notation keys are as follows:</p> <p>(a) “NO” (not occurring) for activities or processes in a particular source or sink category that do not occur within a country;</p> <p>(b) “NE” (not estimated) for existing emissions by sources and removals by sinks of greenhouse gases which have not been estimated. Where “NE” is used in an inventory for emissions or removals of CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFCs, PFCs or SF<sub>6</sub>, the Annex I Party should indicate in both the NIR and the CRF completeness table why emissions or removals have not been estimated;</p> <p>(c) “NA” (not applicable) for activities in a given source/sink category that do not result in emissions or removals of a specific gas. If categories in the CRF for which “NA” is applicable are shaded, they do not need to be filled in;</p> <p>(d) “IE” (included elsewhere) for emissions by sources and removals by sinks of greenhouse gases estimated but included elsewhere in the inventory instead of the expected source/sink category. Where “IE” is used in an inventory, the Annex I Party should indicate, using the CRF completeness table, where in the inventory the emissions or removals from the displaced source/sink category have been included and the Annex I Party should explain such a deviation from the expected category;</p> <p>(e) “C” (confidential) for emissions by sources and removals by sinks of greenhouse gases which could lead to the disclosure of confidential information, given the provisions of paragraph 27 above</p>	<p>The notation keys are as follows:</p> <p>(a) “NO” (not occurring) for categories or processes, including recovery, under a particular source or sink category that do not occur within an Annex I Party;</p> <p>(b) “NE” (not estimated) for AD and/or emissions by sources and removals by sinks of GHGs which have not been estimated but for which a corresponding activity may occur within a Party. Where “NE” is used in an inventory to report emissions or removals of CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>, the Annex I Party shall indicate in both the NIR and the CRF completeness table why such emissions or removals have not been estimated. <i>Furthermore, a Party may consider that a disproportionate amount of effort would be required to collect data for a gas from a specific category that would be insignificant in terms of the overall level and trend in national emissions and in such cases use the notation key “NE”. The Party should in the NIR provide justifications for exclusion in terms of the likely level of emissions. An emission should only be considered insignificant if the likely level of emissions is below 0.05 per cent of the national total GHG emissions, and does not exceed 500 kt CO<sub>2</sub> eq. The total national aggregate of estimated emissions for all gases and categories considered insignificant shall remain below 0.1 per cent of the national total GHG emissions. Parties should use approximated AD and default IPCC EFs to derive a likely level of emissions for the respective category. Once emissions from a specific category have been reported in a previous submission, emissions from this specific category shall be reported in subsequent GHG inventory submissions;</i></p> <p>(c) “NA” (not applicable) for activities under a given source/sink category that do occur within the Party but do not result in emissions or removals of a specific gas. If the cells for categories in the CRF tables for which “NA” is applicable are shaded, they do not need to be filled in;</p> <p>(d) “IE” (included elsewhere) for emissions by sources</p>

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	<p>and removals by sinks of GHGs estimated but included elsewhere in the inventory instead of under the expected source/sink category. Where “IE” is used in an inventory, the Annex I Party should indicate, in the CRF completeness table, where in the inventory the emissions or removals for the displaced source/sink category have been included, and the Annex I Party should explain such a deviation from the inclusion under the expected category, <i>especially if it is due to confidentiality</i>;</p> <p>(e) “C” (confidential) for emissions by sources and removals by sinks of GHGs of which the reporting could lead to the disclosure of confidential information, given the provisions of paragraph 36 above.</p>
<p>29. If Annex I Parties estimate and report emissions and removals from country-specific sources or sinks or of gases which are not part of the IPCC Guidelines, they should explicitly describe what source/sink categories or gases these are, as well as what methodologies, emission factors and activity data have been used for their estimation and provide the references for these data.</p>	<p>38. <i>Annex I Parties are encouraged to estimate and report emissions and removals for source or sink categories for which estimation methods are not included in the 2006 IPCC Guidelines.</i> If Annex I Parties estimate and report emissions and removals for country-specific sources or sinks or of gases which are not included in the 2006 IPCC Guidelines, they should explicitly describe what source/sink categories or gases these are, as well as what methodologies, EFs and AD have been used for their estimation, and provide references for these data.</p>
<p><u>Key categories</u></p>	<p><u>Key categories</u></p>
<p>30. Annex I Parties shall estimate and report the individual and cumulative percentage contributions from key categories to their national total, with respect to both level and trend. The emissions should be expressed in terms of CO<sub>2</sub> equivalents using the methods provided in the IPCC good practice guidance. As indicated in paragraphs 41 and 47 below, this information should be included in table 7 of the CRF as well as the NIR using tables 7.1 – 7.3 of the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and tables 5.4.1 – 5.4.3 of the Good Practice Guidance for Land Use, Land-Use Change and Forestry adapted to the level of category disaggregation that the Annex I Party used for determining its key categories.</p>	<p>39. Annex I Parties shall estimate and report the individual and cumulative percentage contributions from key categories to their national total, with respect to both level and trend. The emissions should be expressed in terms of CO<sub>2</sub> eq using the methods provided in the <i>2006 IPCC Guidelines</i>. As indicated in paragraph 50 below, this information should be included in the NIR using tables 4.2 and 4.3 of the 2006 IPCC Guidelines, adapted to the level of category disaggregation that the Annex I Party used for determining its key categories.</p>

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<p><u>Verification</u></p>	<p><u>Verification</u></p>
<p>31. In accordance with the IPCC Guidelines, as well as for verification purposes, Annex I Parties should compare their national estimates of carbon dioxide emissions from fuel combustion with those estimates obtained using the IPCC reference approach, and report the results of this comparison in the CRF and NIR.</p>	<p>40. For the purposes of verification, Annex I Parties should compare their national estimates of CO<sub>2</sub> emissions from fuel combustion with those estimates obtained using the IPCC reference approach, as contained in the <i>2006 IPCC Guidelines</i>, and report the results of this comparison in the NIR.</p>
<p>Annex I Parties are also encouraged to report on any peer review of their inventory conducted nationally. (see Para 46. 24/CP.19)</p>	
<p>-</p>	<p><i>41. Annex I Parties that prepare their estimates of emissions and/or removals using higher-tier (tier 3) methods and/or models shall provide in the NIR verification information consistent with the 2006 IPCC Guidelines.</i></p>
<p><u>Uncertainties</u></p>	<p><u>Uncertainties</u></p>
<p>32. Annex I Parties shall report, in the NIR, uncertainties estimated as indicated in paragraph 14 above, as well as methods used and underlying assumptions, with the purpose of helping to prioritize efforts to improve the accuracy of national inventories in the future and guide decisions on methodological choice. This information should be presented using tables 6.1 and 6.2 of the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories adding the lines for the relevant LULUCF categories as indicated in section 5.2.5 of the Good Practice Guidance for Land Use, Land-Use Change and Forestry. In these tables, the term “national total” refers to the absolute value of emissions by sources minus the magnitude of removals by sinks. In addition, Annex I Parties should indicate in these tables those categories that have been identified as key categories in their inventory. If the methods used to estimate the level of uncertainty depart from the IPCC good practice guidance, these methods should be described.</p>	<p>42. Annex I Parties shall report, in the NIR, uncertainties estimated as indicated in paragraph 15 above, as well as methods used and underlying assumptions, for the purpose of helping to prioritize efforts to improve the accuracy of national inventories in the future and to guide decisions on methodological choice. This information should be presented using table 3.3 of volume 1 of the <i>2006 IPCC Guidelines</i>. In addition, Annex I Parties should indicate in that table those categories that have been identified as key categories in their inventory.</p>

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<p><u>Recalculations</u></p>	<p><u>Recalculations</u></p>
<p>33. Recalculations of previously submitted estimates of emissions and removals as a result of changes in methodologies, changes in the manner in which emission factors and activity data are obtained and used, or the inclusion of new sources or sinks which have existed since the base year but were not previously reported, should be reported for the base year and all subsequent years up to the year in which the recalculations are made.</p>	<p>43. Recalculations of previously submitted estimates of emissions and removals as a result of changes in methodologies, changes in the manner in which EFs and AD are obtained and used, or the inclusion of new sources or sinks which have existed since the base year but were not previously reported, shall be reported for the base year and all subsequent years of the time series up to the year for which the recalculations are made. <i>Further, a discussion on the impact of the recalculations on the trend in emissions should be provided in the NIR at the category, sector and national total level, as appropriate.</i></p>
<p>34. Recalculations should be reported in the NIR, with explanatory information including justification for recalculations, and in the relevant CRF tables. Annex I Parties should also provide explanations for those cases in which they have not recalculated an estimate when such a recalculation is called for in the IPCC good practice guidance. Information on the procedures used for performing the recalculations, changes in the calculation methods, emission factors and activity data used, and the inclusion of sources or sinks not previously covered, should be reported with an indication of the relevant changes in each source or sink category where these changes have taken place. For key categories, Annex I Parties should include this information in the NIR, as indicated in paragraph 41 below.</p>	<p>44. Recalculations shall be reported in the NIR, with explanatory information and justifications for recalculations. Information on the procedures used for performing the recalculations, changes in the calculation methods, EFs and AD used, and the inclusion of sources or sinks not previously covered should be reported with an indication of the relevant changes in each source or sink category where these changes have taken place.</p>
<p>35. Annex I Parties should report any other changes in estimates of emissions and removals, regardless of magnitude, and clearly indicate the reason for the changes compared with previously submitted inventories, e.g., error correction, statistical or editorial changes or reallocation of categories, using the corresponding CRF table, as indicated in paragraph 47 below and outlined in the annex II to these guidelines.</p>	<p>45. Annex I Parties shall report any other changes in estimates of emissions and removals, and clearly indicate the reason for the changes compared with previously submitted inventories (e.g. error correction, statistical reason or reallocation of categories), in the NIR as indicated in paragraph 50 below. <i>Small differences (e.g. due to the rounding of estimates) should not be considered as recalculations.</i></p>
<p><u>Quality assurance/quality control (QA/QC)</u></p>	<p><u>Quality assurance/quality control (QA/QC)</u></p>
<p>36. Annex I Parties shall report in the NIR on their QA/QC plan and give information on QA/QC procedures already implemented or to be</p>	<p>46. Annex I Parties shall report in the NIR on their QA/QC plan and give information on QA/QC procedures already implemented or to be implemented in the future. <i>In addition, Annex I Parties are</i></p>

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<p>implemented in the future.</p>	<p><i>encouraged to report on any peer review of their inventory, apart from the UNFCCC review.</i></p>
<p><u>Adjustments</u></p>	<p><u>Corrections</u></p>
<p>37. Inventories are to be reported without adjustments relating, for example, to climate variations or trade patterns of electricity.</p>	<p>47. Inventories <b>shall</b> be reported without <i>corrections</i> relating, for example, to climate variations or trade patterns of electricity.</p>
<p>If Annex I Parties, in addition, carry out such adjustments to inventory data, they should be reported separately and in a transparent manner, with clear indications of the method followed.</p>	<p align="center">-</p>
<p align="center">2. <u>National inventory report</u></p>	<p align="center"><b>2. National inventory report</b></p>
<p>38. Annex I Parties shall submit to the COP, through the secretariat, an NIR containing detailed and complete information on their inventories. The NIR should ensure transparency and contain sufficiently detailed information to enable the inventory to be reviewed. This information should cover the entire time series, from the base year to the latest inventory year, and any changes to previously submitted inventories.</p>	<p>48. Annex I Parties <i>shall</i> submit to the COP, through the secretariat, an NIR containing detailed and complete information on their inventories. The NIR should ensure transparency and contain sufficiently detailed information to enable the inventory to be reviewed. <i>This information should cover the base year, the most recent 10 years and any previous years since the base year ending with 0 or 5 (1990, 1995, 2000, etc.).</i></p>
<p>39. Each year, an updated NIR shall be electronically submitted in its entirety to the COP, through the secretariat, in accordance with the relevant decisions of the COP; in instances where Annex I Parties have produced published hard copy versions of their NIR, they are also encouraged to submit copies to the secretariat.</p>	<p>49. Each year, an updated NIR shall be electronically submitted in its entirety to the COP, through the secretariat, in accordance with the relevant decisions of the COP.</p>
<p>40. The NIR shall include annual inventory information, submitted in accordance with paragraph 38 above.</p>	<p align="center">-</p>
<p>41. The NIR should include:</p> <p>(a) Descriptions, references and sources of information of the specific methodologies, assumptions, emission factors and activity data, as well as the rationale for their selection. It also should include an indication of the level of complexity (IPCC tiers) applied and a</p>	<p>50. The NIR <i>shall</i> include:</p> <p>(a) Descriptions, references and sources of information for the specific methodologies, including higher-tier methods and models, assumptions, EFs and AD, as well as the rationale for their selection. For tier 3 models, additional information for improving</p>

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<p>description of any national methodology used by the Annex I Party, as well as information on anticipated future improvements. For key categories, an explanation should be provided if the recommended methods from the appropriate decision tree in the IPCC good practice guidance are not used. In addition, activity data, emission factors and related information should be documented in accordance with the IPCC good practice guidance.</p> <p>(b) A description of the national key categories as indicated in paragraph 30, including:</p> <p>(i) Reference to the key category tables in the CRF;</p> <p>(ii) Information on the level of category disaggregation used and its rationale;</p> <p>(iii) Additional information relating to the methodology used for identifying key categories;</p> <p>(c) With regard to possible double counting or non-counting of emissions, an indication in the corresponding sectoral part of the NIR:</p> <p>(i) Whether feedstocks and non-energy use of fuels have been accounted for in the inventory, and if so, where they have been accounted for in the energy or industrial processes sector;</p> <p>(ii) Whether CO<sub>2</sub> from biomass burning has been estimated and where it has been accounted for in the sectoral background data tables of the CRF (tables 5.A-5.F, and table 5(V));</p> <p>(iii) Whether emissions of CO<sub>2</sub> corresponding to atmospheric oxidation of CO, NMVOCs and CH<sub>4</sub> emissions from non-combustion and from non-biogenic processes, such as solvent use, coal mining and handling, venting and leakages of fossil fuels, have been accounted for in the inventory;</p> <p>(iv) Information on source or sink categories excluded or potentially excluded, including efforts to develop estimates for future submissions;</p>	<p>transparency;</p> <p>(b) An indication of the level of complexity (IPCC tier) applied and a description of any national methodology used by the Annex I Party, as well as information on anticipated future improvements;</p> <p>(c) For key categories, an explanation if the recommended methods from the appropriate decision tree in the 2006 IPCC Guidelines are not used;</p> <p>(d) A description of the national key categories, as indicated in paragraph 39 above, including:</p> <p>(i) A summary table with the key categories identified for the latest reporting year (by level and trend);</p> <p>(ii) Information on the level of category disaggregation used and the rationale for its use;</p> <p>(iii) Additional information relating to the methodology used for identifying key categories;</p> <p>(e) Information on how and where feedstocks and non-energy use of fuels have been reported in the inventory;</p> <p>(f) Assessment of completeness, including information and explanations in relation to categories not estimated or included elsewhere, and information related to the geographical scope;</p> <p>(g) Information on uncertainties, as requested in paragraph 42 above;</p> <p>(h) Information on any recalculations relating to previously submitted inventory data, as requested in</p>



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<p>(d) Information on how the effects of CO<sub>2</sub> capture from flue gases and subsequent CO<sub>2</sub> storage are accounted for in the inventory;</p> <p>(e) Information on uncertainties, as requested in paragraph 32 above;</p> <p>(f) Information on any recalculations relating to previously submitted inventory data, as requested in paragraphs 33 to 35 above, including changes in methodologies, sources of information and assumptions, as well as recalculations in response to the review process;</p> <p>(g) Information on changes from previous years, not related to recalculations, including the changes in methodologies, sources of information and assumptions, as well as changes in response to the review process;</p> <p>(h) Information on QA/QC as requested in paragraph 36 above, describing the QA/QC plan, and the QA/QC activities implemented for the entire inventory as well as for individual categories, in particular key categories, and the entire inventory performed internally, as well as on the external reviews conducted, if any. Key findings on the quality of the input data, methods, processing and archiving and how they have been addressed, should be described;</p> <p>(i) A description of the institutional arrangements for inventory preparation.</p>	<p>paragraphs 43 to 45 above, including changes in methodologies, sources of information and assumptions, in particular in relation to recalculations made in response to the review process;</p> <p>(i) Information on changes in response to the review process;</p> <p><i>(j) Information on the national inventory arrangements and changes to the national inventory arrangements, including a description of the institutional arrangements for inventory preparation, as well as information on verification as requested in paragraphs 40 and 41 above and on QA/QC as requested in paragraph 46 above.</i></p>
<p>42. If any of the information required under paragraph 41 (a) to (h) above is provided in detail in the CRF, Annex I Parties should indicate in the NIR where in the CRF this information is provided.</p>	<p align="center">-</p>
<p>43. The NIR should be reported in accordance with the outline contained in the annex I to these</p>	<p><i>51. The NIR should follow the outline and general</i></p>

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<p>guidelines, ensuring that all information requested in paragraph 41 above is included.</p>	<p><i>structure contained in annex I to decision 24/CP.19.</i></p>
<p align="center"><b>3. <u>Common reporting format</u></b></p>	<p align="center"><b>3. Common reporting format</b></p>
<p>44. The common reporting format (CRF) is designed to ensure that Annex I Parties report quantitative data in a standardized format and to facilitate comparison of inventory data and trends among Annex I Parties. Explanation of information of a qualitative character should mainly be provided in the NIR rather than in the CRF tables. Such explanatory information should be cross-referenced to the specific section of the NIR.</p>	<p>52. The CRF tables are designed to ensure that Annex I Parties report quantitative data in a standardized format and to facilitate comparison of inventory data and trends. Explanation of information of a qualitative character should mainly be provided in the NIR rather than in the CRF tables. Such explanatory information should be cross-referenced to the specific chapter of the NIR</p>
<p>45. Annex I Parties shall submit annually to the COP, through the secretariat, the information required in the CRF as contained in annex II to these guidelines. This information shall be electronically submitted on an annual basis in its entirety to the COP, through the secretariat, in accordance with the relevant decisions of the COP.</p>	<p>53. Annex I Parties shall submit annually to the COP, through the secretariat, the information required in the CRF tables, as contained in annex II to <i>decision 24/CP.19</i>. This information shall be electronically submitted on an annual basis in its entirety to the COP, through the secretariat, in accordance with the relevant decisions of the COP. <i>Parties should submit their CRF tables, generated by the CRF Reporter software, via the UNFCCC submission portal, with a view to facilitating the processing of the inventory information by the secretariat.</i></p>
<p>46. The CRF is a standardized format for reporting estimates of greenhouse gas emissions and removals and other relevant information. The CRF allows for the improved handling of electronic submissions and facilitates the processing of inventory information and the preparation of useful technical analysis and synthesis documentation.</p>	<p>54. The CRF is a standardized format for reporting estimates of GHG emissions and removals and other relevant information. The CRF allows for the improved handling of electronic submissions and facilitates the processing of inventory information and the preparation of useful technical analysis and synthesis documentation.</p>
<p>47. The CRF consists of:</p> <p>(a) Summary, sectoral and trend tables for all greenhouse gas emissions and removals;</p> <p>(b) Sectoral background data tables for reporting implied emission factors and activity data, including:</p>	<p align="center">-</p>

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<p align="center"><b>Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous</b></p>	<p align="center"><b>Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new</b></p>
<p>(i) IPCC worksheet 1-1 containing estimates of CO<sub>2</sub> emissions from fuel combustion using the IPCC reference approach and a table for comparing estimates under this reference approach with estimates under the sectoral approach, as well as providing explanations of any significant differences;</p> <p>(ii) Tables for reporting fossil fuel consumption for non-energy feedstocks, international bunkers and multilateral operations;</p> <p>(c) Tables for reporting, inter alia, key categories, recalculations and completeness of the inventory.</p>	
<p>48. The CRF should be reported in accordance with the tables included in annex II to these guidelines, ensuring that all information requested in paragraph 47 above is included. In completing these tables Annex I Parties should:</p> <p>(a) Provide the full CRF for the latest inventory year and for those years for which any change in any sector has been made. For years where no changes are made, resubmission of full CRF tables is not necessary, but a reference should be made to the inventory submission in which the unchanged data were reported originally. Annex I Parties should ensure that a full and time-series consistent set of CRF tables is annually available for the entire time series from the base year onwards;</p> <p>(b) Provide the CRF trend tables covering inventory years for the entire time series in one submission only, that is, in the CRF for the last inventory year;</p> <p>(c) Provide completeness tables in one submission only if the information applies to all years. If the information in these tables differs for each reported year, then either the tables or information on the specific changes must be</p>	<p>55. The CRF tables <i>shall</i> be reported in accordance with the tables included in annex II to decision -/CP.19 and as specified in these reporting guidelines. In completing the CRF tables, Annex I Parties:</p> <p>(a) Shall provide a full set of CRF tables for the base year and all years from 1990 up to the most recent inventory year;</p> <p>(b) Should provide completeness tables for the latest inventory year only, if the information applies to all years of the time series. If the information in those tables differs for each reported year, then either the tables or information on the specific changes must be provided for each year in the CRF tables;</p> <p>(c) Should use the documentation boxes provided at the foot of the sectoral report and background data tables to provide cross references to detailed explanations in the NIR, or any other information, as specified in those boxes.</p>

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<p align="center"><b>Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous</b></p>	<p align="center"><b>Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new</b></p>
<p>provided for each year in the CRF;</p> <p>(d) Use the documentation boxes provided at the foot of the sectoral report and background data tables to provide cross-references to detailed explanations in the NIR, or any other information, as specified in those boxes.</p>	
<p>49. Annex I Parties should provide the information requested in the additional information boxes. Where the information called for is inappropriate because of the methodological tier used by the Annex I Party, the corresponding cells should be completed using the notation key “NA”. In such cases, the Annex I Parties should cross-reference in the documentation box the relevant section in the NIR where equivalent information can be found.</p>	<p>56. Annex I Parties should provide the information requested in the additional information boxes. Where the information called for is inappropriate because of the methodological tier used by the Annex I Party, the corresponding cells should be completed using the notation key “NA”. In such cases, the Annex I Parties should cross-reference in the documentation box the relevant chapter in the NIR where equivalent information can be found.</p>
<p>50. Annex I Parties should use the notation keys, as specified in paragraph 28 above, in all tables of the CRF, to fill in the cells where no quantitative data are directly entered. Using the notation keys in this way facilitates the assessment of the completeness of an inventory. Specific guidance is provided on how notation keys should be used in each CRF table where qualitative information is required.</p>	<p>57. Annex I Parties should use the notation keys, as specified in paragraph 37 above, in all the CRF tables to fill in the cells where no quantitative data are directly entered. Using the notation keys in this way facilitates the assessment of the completeness of an inventory.</p>
<p><b>G. Record-keeping</b></p>	<p><b>H. Record-keeping</b></p>
<p>51. Annex I Parties should gather and archive all relevant inventory information for each year, including all disaggregated emission factors, activity data and documentation on how these factors and data were generated, including expert judgment where appropriate, and how they have been aggregated for reporting in the inventory. This information should allow reconstruction of the inventory by the expert review teams, inter alia. Inventory information should be archived from the base year and should include corresponding data on the recalculations applied. The “paper trail”, which can include spreadsheets or databases used to compile inventory data, should enable estimates of emissions and removals to be traced back to the original disaggregated emission factors and</p>	<p>58. Annex I Parties should gather and archive all relevant inventory information for each year of the reported time series, including all disaggregated EFs and AD, and documentation on how those factors and data were generated, including expert judgment where appropriate, and how they have been aggregated for their reporting in the inventory. This information should allow for the reconstruction of the inventory by the expert review teams. Inventory information should be archived from the base year and should include corresponding data on the recalculations applied. The ‘paper trail’, which can include spreadsheets or databases used to compile inventory data, should enable estimates of emissions and removals to be traced back to the original disaggregated EFs and AD. Also, relevant supporting documentation related to QA/QC implementation, uncertainty evaluation or key category</p>

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<p align="center"><b>Updated UNFCCC reporting guidelines on annual GHG inventories (FCCC/SBSTA/2006/9) - previous</b></p>	<p align="center"><b>Revised UNFCCC reporting guidelines on annual GHG inventories (24/CP.19) - new</b></p>
<p>activity data. Also, relevant supporting documentation related to QA/QC implementation, uncertainty evaluation, or key category analyses should be kept on file. This information should also facilitate the process of clarifying inventory data in a timely manner when the secretariat prepares annual compilations of inventories or assesses methodological issues. Annex I Parties are encouraged to collect and gather the information in a single national inventory facility or, at least, to keep the number of facilities to a minimum.</p>	<p>analyses should be kept on file. This information should facilitate the process of clarifying inventory data in a timely manner when the secretariat prepares annual compilations of inventories or assesses methodological issues.</p>
<p><b>H. Systematic update of the guidelines</b></p>	<p><b>I. Systematic update of the guidelines</b></p>
<p>52. These UNFCCC reporting guidelines on annual inventories shall be reviewed and revised, as appropriate, in accordance with decisions of the COP on this matter.</p>	<p>59. The UNFCCC Annex I inventory reporting guidelines on annual GHG inventories shall be reviewed and revised, as appropriate, in accordance with decisions of the COP on this matter.</p>
<p><b>I. Language</b></p>	<p><b>J. Language</b></p>
<p>53. The national inventory report shall be submitted in one of the official languages of the United Nations. Annex I Parties are also encouraged to submit, where relevant, a translation of the national inventory report into English.</p>	<p>60. The NIR shall be submitted in one of the official languages of the United Nations. Annex I Parties are encouraged to submit an English translation of the NIR to facilitate its use by the expert review teams.</p>

*Note on the information provided in the comparison table:*

The table above provides a detailed comparative view of the previous updated “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, Part I) (FCCC/SBSTA/2006/9) and the latest revised “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” (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines) (decision 24/CP.19). New text/content introduced in the latest revised UNFCCC Annex I inventory reporting guidelines is indicated in *italics* for easier identification of the changes between the two versions of the reporting guidelines.

## Annex II

### Information on updated global warming potential values and new greenhouse gases

Table II.1. List of greenhouse gases and the global warming potential values

Greenhouse gas	RG 2014	RG 2006	GWP 4AR	GWP SAR
CO <sub>2</sub>	•	•	1	1
CH <sub>4</sub>	•	•	25	21
N <sub>2</sub> O	•	•	298	310
<b>HFCs</b>				
HFC-23	•	•	14 800	11 700
HFC-32	•	•	675	650
HFC-41	•	•	92	150
HFC-43-10mee	•	•	1 640	1 300
HFC-125	•	•	3 500	2 800
HFC-134	•	•	1 100	1 000
HFC-134a	•	•	1 430	1 300
HFC-143	•	•	353	300
HFC-143a	•	•	4 470	3 800
HFC-152	•		53	–
HFC-152a	•	•	124	140
HFC-161	•		12	–
HFC-227ea	•	•	3 220	2 900
HFC-236cb	•		1 340	–
HFC-236ea	•		1 370	–
HFC-236fa	•	•	9 810	6 300
HFC-245ca	•		693	–
HFC-245fa	•		1 030	–
HFC-365mfc	•		794	–
<b>Perfluorocarbons</b>				
Perfluoromethane	•	•	7 390	6 500

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<b>Greenhouse gas</b>	<b>RG 2014</b>	<b>RG 2006</b>	<b>GWP 4AR</b>	<b>GWP SAR</b>
Perfluoroethane	•	•	12 200	9 200
Perfluoropropane	•	•	8 830	7 000
Perfluorobutane	•	•	8 860	7 000
Pefluorocyclobutane	•	•	10 300	8 700
Perfluoropentane	•	•	9 160	7 500
Perfluorohexane	•	•	9 300	7 400
Perfluorodecalin	•		7 500	–
Perfluorocyclopropane	•		17 340	–
<b>Sulphur hexafluoride</b>				
SF <sub>6</sub>	•	•	22 800	23 900
<b>Nitrogen trifluoride</b>				
NF <sub>3</sub>	•		17 200	–
<b>Fluorinated ethers</b>				
HFE-125	•		14 900	–
HFE-134	•		6 320	–
HFE-143a	•		756	–
HCFE-235da2	•		350	–
HFE-245cb2	•		708	–
HFE-245fa2	•		659	–
HFE-254cb2	•		359	–
HFE-347mcc3	•		575	–
HFE-347pcf2	•		580	–
HFE-356pcc3	•		110	–
HFE-449sl	•		297	–
HFE-569sf2	•		59	–
HFE-43-10pccc124	•		1 870	–
HFE-236ca12	•		2 800	–
HFE-338pcc13	•		1 500	–
HFE-227ea	•		1 540	–

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<b>Greenhouse gas</b>	<b>RG 2014</b>	<b>RG 2006</b>	<b>GWP 4AR</b>	<b>GWP SAR</b>
HFE-236ea2	●		989	–
HFE-236fa	●		487	–
HFE-245fa1	●		286	–
HFE-263fb2	●		11	–
HFE-329mcc2	●		919	–
HFE-338mfc2	●		552	–
HFE-347mcf2	●		374	–
HFE-356mec3	●		101	–
HFE-356pcf2	●		265	–
HFE-356pcf3	●		502	–
HFE-365mcf1'11t3	●		11	–
HFE-374pc2	●		557	–
<b>Perfluoropolyethers</b>				
PFPME	●		10 300	–
<b>Trifluoromethyl sulphur pentafluoride</b>	●		17 700	–

*Note on the information provided in the table:*

Table above contains a list of greenhouse gases (GHGs) and their respective global warming potential (GWP) values as listed in:

- (a) Annex III to decision 24/CP.19 (“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”), which has been in use since 2015 (referred to as RG 2014 in table 1 below);
- (b) Table 1 of the updated “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”, which was in use prior to 2015 (referred to as RG 2006 in table 1 below).

The scope of GHGs as stipulated by RG 2014 and RG 2006 is indicated with “●” in the table. The GWP values from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (referred to as GWP 4AR in table 1 below) are associated with the GHGs from the revised reporting guidelines (RG 2014). For comparison purposes, the previous GWP values from the Second Assessment Report of the IPCC (referred to as GWP SAR in table 1 below) are also listed in the table. Both sets of GWP values are based on the effects of GHGs over a 100-year time horizon.



## Annex III

### Implications of the revised UNFCCC Annex I inventory reporting guidelines on the description of the quantified economy-wide emission reduction target

Table 1. The overview of changes in the information provided on the description of the quantified economy-wide emission reduction target in the first biennial reports (BR1s) and the second biennial reports (BR2s)

Annex I Party	BR	Base year	Target	Gases covered and base year	Sectors covered	GWP	LULUCF	MBM
BR CTF table		2(a)	2(a)	2(b)	2(b)	2(c)	2(d)	2(e)
Australia	BR1	–	–	–	–	SAR	Activity-based	Not reported
	BR2	–	–	–	–	4AR	KP-LULUCF	Carry over units: 149 419.06
Austria	BR1	–	–	–	–	SAR	–	–
	BR2	–	–	–	–	4AR	–	–
Belarus	BR1	–	88% of the base year (i.e. 1990)	HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub> – 1995	LULUCF – no	SAR	–	Not reported
	BR2	–	8% of 1990	HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub> – 1990	LULUCF – yes	SAR	–	NA
Belgium	BR1	–	–	NF <sub>3</sub> – not defined	Other sectors: N <sub>2</sub> O emissions from anaesthesia, aviation and fugitive emissions	4AR	–	–
	BR2	–	–	NF <sub>3</sub> – 1995	Other: aviation under the EU ETS (not covered)	4AR	–	–
Bulgaria	BR1	1988	% of 1990 – NE	NF <sub>3</sub> – not defined	–	4AR	Excluded	–
	BR2	Not reported	% of 1990 – 20%	NF <sub>3</sub> – 1995	–	4AR	Included	–
Croatia	BR1	–	–	–	–	SAR	–	–

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<b>Annex I Party</b>	<b>BR</b>	<b>Base year</b>	<b>Target</b>	<b>Gases covered and base year</b>	<b>Sectors covered</b>	<b>GWP</b>	<b>LULUCF</b>	<b>MBM</b>
<b>BR CTF table</b>		<b>2(a)</b>	<b>2(a)</b>	<b>2(b)</b>	<b>2(b)</b>	<b>2(c)</b>	<b>2(d)</b>	<b>2(e)</b>
	BR2	–	–	–	–	4AR	–	–
Czech Republic	BR1	–	–	NF <sub>3</sub> – not defined	–	4AR	Land-based approach	–
	BR2	–	–	NF <sub>3</sub> – 1995	–	4AR	Not reported	–
Denmark	BR1	–	–	NF <sub>3</sub> – not defined	Other sectors	4AR	Activity-based approach	0.00
	BR2	–	–	NF <sub>3</sub> – NA	Other: aviation under the EU ETS (covered)	4AR	Not reported	Not reported
Estonia	BR1	–	–	NF <sub>3</sub> – not defined	–	4AR	–	NE
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	Not reported
European Union	BR1	–	–	NF <sub>3</sub> – 1995/2000	Other sectors: aviation, Other (CRF 3+7)	4AR	–	–
	BR2	–	–	NF <sub>3</sub> – not reported	Other: aviation under the EU ETS (covered)	4AR	–	–
Finland	BR1	–	–	NF <sub>3</sub> – not defined	–	4AR	–	NE
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	NA
France	BR1	–	–	NF <sub>3</sub> – 1990	–	4AR	–	0.00
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	NA

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<b>Annex I Party</b>	<b>BR</b>	<b>Base year</b>	<b>Target</b>	<b>Gases covered and base year</b>	<b>Sectors covered</b>	<b>GWP</b>	<b>LULUCF</b>	<b>MBM</b>
<b>BR CTF table</b>		<b>2(a)</b>	<b>2(a)</b>	<b>2(b)</b>	<b>2(b)</b>	<b>2(c)</b>	<b>2(d)</b>	<b>2(e)</b>
Germany	BR1	–	–	HFCs, PFCs, SF6, NF3 – 1990	–	4AR	–	0.00
	BR2	–	–	HFCs, PFCs, SF6, NF3 – 1995	–	4AR	–	0.00
Italy	BR1	–	–	NF3 – 1995/2000	–	4AR	–	Not reported
	BR2	–	–	NF3 – not reported	–	4AR	–	CERs: 1 002.63 Carry over units: 2 473.15
Japan	BR1	2005	–	All gases – 2005	–	SAR (NF3 – 4AR)	–	Not reported
	BR2	FY 2005	–	CO2, CH4, N2O – FY 2005 HFCs, PFCs, SF6, NF3 – CY 2005	–	4AR	–	NE
Latvia	BR1	–	–	PFCs – 1995 NF3 – 1995	–	4AR	–	NE
	BR2	–	–	PFCs – NA NF3 – NA	–	4AR	–	NA
Liechtenstein	BR1	–	–	–	–	2AR	–	NE, NO
	BR2	–	–	–	–	4AR	–	Reported

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<b>Annex I Party</b>	<b>BR</b>	<b>Base year</b>	<b>Target</b>	<b>Gases covered and base year</b>	<b>Sectors covered</b>	<b>GWP</b>	<b>LULUCF</b>	<b>MBM</b>
<b>BR CTF table</b>		<b>2(a)</b>	<b>2(a)</b>	<b>2(b)</b>	<b>2(b)</b>	<b>2(c)</b>	<b>2(d)</b>	<b>2(e)</b>
Lithuania	BR1	–	–	NF <sub>3</sub> – not defined	–	4AR	–	0.00
	BR2	–	–	NF <sub>3</sub> – 1995	–	4AR	–	Not reported
Malta	BR1	–	–	–	–	SAR	–	Not reported
	BR2	–	–	–	–	4AR	–	Reported
Netherlands	BR1	–	–	HFCs, PFCs, SF <sub>6</sub> – 1995	–	SAR	–	–
	BR2	–	–	All GHGs – 1990	–	4AR	–	–
New Zealand	BR1	–	–	–	–	4AR	Included	–
	BR2	–	–	–	–	4AR	Excluded	–
Norway	BR1	–	–	–	–	4AR	–	–
	BR2	–	–	–	–	4AR	–	–
Poland	BR1	–	% of base year (1988) – 20%	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O – 1988 NF <sub>3</sub> – not defined	–	4AR	–	–
	BR2	–	% of base year (1988) – 35%	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O – 1988/1990 NF <sub>3</sub> – 2000	–	4AR	–	–
Portugal	BR1	–	–	HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub> – 1995	–	SAR	Included	–

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<b>Annex I Party</b>	<b>BR</b>	<b>Base year</b>	<b>Target</b>	<b>Gases covered and base year</b>	<b>Sectors covered</b>	<b>GWP</b>	<b>LULUCF</b>	<b>MBM</b>
<b>BR CTF table</b>		<b>2(a)</b>	<b>2(a)</b>	<b>2(b)</b>	<b>2(b)</b>	<b>2(c)</b>	<b>2(d)</b>	<b>2(e)</b>
	BR2	–	–	HFCs, PFCs, SF <sub>6</sub> – 1990 NF <sub>3</sub> – not reported	–	4AR	Excluded	–
Romania	BR1	–	% of base year (1989) – not reported % of 1990 – 80%	NF <sub>3</sub> – not reported	–	SAR	–	0.00/NE
	BR2	–	% of base year (1989) – 20% % of 1990 – 20%	NF <sub>3</sub> – 1995/2000	–	4AR	–	Carry over units: 532 594 270.00
Russian Federation	BR1	–	–	–	–	4AR	–	0.00
	BR2	–	–	–	–	4AR	–	NA
Slovakia	BR1	–	–	NF <sub>3</sub> – 1995/2000	–	SAR	–	–
	BR2	–	–	NF <sub>3</sub> – 2000	–	4AR	–	–
Spain	BR1	–	–	NF <sub>3</sub> – 1995/2000	–	4AR	–	–
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	–
Sweden	BR1	–	–	HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub> – 1995	–	4AR	–	0.00
	BR2	–	–	HFCs, PFCs, SF <sub>6</sub> – 1990	–	4AR	–	NE

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<b>Annex I Party</b>	<b>BR</b>	<b>Base year</b>	<b>Target</b>	<b>Gases covered and base year</b>	<b>Sectors covered</b>	<b>GWP</b>	<b>LULUCF</b>	<b>MBM</b>
<b>BR CTF table</b>		<b>2(a)</b>	<b>2(a)</b>	<b>2(b)</b>	<b>2(b)</b>	<b>2(c)</b>	<b>2(d)</b>	<b>2(e)</b>
				NF <sub>3</sub> – not reported				
Switzerland	BR1	–	–	NF <sub>3</sub> – 1995/2000	–	4AR	–	–
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	–
United Kingdom of Great Britain and Northern Ireland	BR1	–	–	NF <sub>3</sub> – 1995/2000	–	4AR	–	–
	BR2	–	–	NF <sub>3</sub> – not reported	–	4AR	–	–
United States of America	BR1	–	–	–	–	4AR	–	–
	BR2	–	–	–	–	4AR	–	–

*Note on the information provided in the tables:*

The table above provides an overview of changes in the information provided on the description of the quantified economy-wide emission reduction target in the first biennial reports (BR1s) and the second biennial reports (BR2s). If no change has occurred between biennial report submissions, it is indicated as “–” in the table. Otherwise, a short description of the information contained in the BR1s and the BR2s is provided. In the case of global warming potential values, in view of their importance to the analysis of potential implications on the emission reduction target, information is provided irrespective of whether or not the change has occurred.

*Abbreviations:*

4AR = Fourth Assessment Report of the Intergovernmental Panel on Climate Change

BR = biennial report

BR1 = first biennial report

BR2 = second biennial report

CER = certified emission reduction

CTF = common tabular format

CY = calendar year

EU ETS = European Union Emissions Trading System

FY = fiscal year

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GWP = global warming potential

KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

MBM = market-based measure

NA = not applicable

NE = not estimated

NO = not occurring

SAR = Second Assessment Report of the Intergovernmental Panel on Climate Change

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