



**SYNTHESIS AND ASSESSMENT REPORT ON THE GREENHOUSE GAS INVENTORIES  
SUBMITTED IN 2003**

**Note by the secretariat**

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## I. MANDATE

1. The Conference of the Parties (COP), by its decision 19/CP.8, adopted the revised guidelines for the technical review of greenhouse gas (GHG) inventories from Parties included in Annex I to the Convention<sup>1</sup> (hereinafter referred to as the review guidelines) to be applied from the year 2003. It also determined, by decision 18/CP.8, that the reporting guidelines adopted by decision 3/CP.5 should be used for the inventory due by 15 April 2003.

2. As part of the inventory review process, the COP requested the secretariat to conduct an annual synthesis and assessment of GHG inventories for all Annex I Parties. The purposes of the synthesis and assessment are to facilitate the consideration of inventory data and other information across Parties, and to identify issues for further consideration during the reviews of individual inventories (desk reviews, centralized reviews and in-country reviews). The synthesis and assessment is to be prepared in two parts. Part I is to provide information to allow comparisons across Annex I Parties, as well as descriptions of common methodological issues. Part II is to provide a preliminary analysis of individual Annex I Party inventories, in particular to identify outstanding issues requiring clarification during the individual review stage of the process.

3. In accordance with decision 19/CP.8, Part I of this present synthesis and assessment report has been sent to Parties for comment prior to publication on the UNFCCC web site. Part II will be sent to the respective Party for comments and, together with the comments from the respective Party, will be provided to the corresponding expert review team as input for the individual review; Part II will not be published on the UNFCCC web site.

## II. COMPARISON OF GHG INVENTORY INFORMATION

### A. Approach

4. This document contains Part I of the synthesis and assessment report, covering the national GHG inventories submitted in 2003 by those Annex I Parties that used the common reporting format (CRF) in accordance with the UNFCCC reporting guidelines (FCCC/CP/1999/7).

5. This document covers only the inventory information submitted in the CRF and not information contained in the national inventory reports. Information in this document is not intended as a judgment of whether inventory problems exist, but as an indication of potential issues that need to be considered further during the third stage of the review process (individual review) by the expert review teams.

6. The completeness of this report is limited by the fact that only 29 out of 40 Annex I Parties submitted their inventory within six weeks after the due date for submissions. Accordingly, this report covers inventories submitted by: Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Estonia, European Community, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Luxemburg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, United States of America.<sup>2</sup>

7. This synthesis and assessment report contains greenhouse gas inventory information from those Parties, compiled in tabular format. The tables provide comparisons of implied emission factors and activity data as reported in the CRF, data from international sources, emissions, information on methods used and emission factors as reported by Parties in Summary table 3 of the CRF, and other information relating to GHG inventory estimates. Where possible, this information is provided for all 29 Parties and for

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<sup>1</sup> The full text of the guidelines is contained in document FCCC/CP/2002/8.

<sup>2</sup> Slovenia also submitted its inventory within this time period. However, because the information was not submitted in the CRF, it has not been included in this report.

the base year and for the years from 1995 to 2001. For some sectors and categories, however, trend comparisons across all Parties were not possible due to the lack of data for some or all of these years.

8. The inventory data were analyzed according to the sectors, subsectors and source categories specified in the CRF, which correspond to those of the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC Guidelines).

9. To facilitate the analysis of the inventory data, the secretariat considers, for each individual Party, those source categories that are *key sources* in terms of their absolute level of emissions and impact on the trend, applying the tier 1 level and trend assessment as described in chapter 7 “Methodological choice and recalculations” of the *IPCC Good Practice Guidance and Uncertainty Management* (hereinafter referred to as the IPCC good practice guidance).<sup>3</sup> This identification has been performed at the level of detail recommended in that guidance. The land-use change and forestry sector has not been included in the calculation of the key source assessments.<sup>4</sup>

### **B. Explanatory notes to the tables**

10. Blank cells in a table indicate that a Party did not report information for a given source and gas in the appropriate table of the CRF.

11. The differences in activity data between the CRF and international data sources were calculated as percentage deviations from the activity data provided in the CRF. A positive number indicates that the data from the international data source are higher than the data reported in the CRF. Similarly, a negative number indicates that data from the international data source are lower than the data reported in the CRF.

12. References to the base year refer to 1990, except for the following Parties with economies in transition which, in accordance with decisions 9/CP.2 and 11/CP.4, use base years other than 1990: Bulgaria (1988), Hungary (average 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

13. Key sources identified by the secretariat’s analysis are indicated by “L” for level and “T” for trend assessments in the “key source” columns. The column “Share of national total” indicates the contribution of that key source to the Party’s national total of GHG emissions in terms of CO<sub>2</sub> equivalent, excluding emissions and removals from land-use change and forestry.

14. Tables on energy indicate whether implied emission factors given in the CRF are based on gross calorific value (GCV) or net calorific value (NCV). The difference between the NCV and the GCV for each fuel is the latent heat of vaporization of the water produced during combustion of the fuel. For coal and oil, NCV is 5 per cent less than GCV, and for most forms of natural and manufactured gas the difference is 9 to 10 per cent.

15. Where Parties used notation keys (NO, NE, NA, IE, C, 0) these have been reproduced verbatim from the CRF tables provided by Parties. The notation keys, as described in the UNFCCC reporting guidelines (FCCC/CP/1999/7), are as follows:

NO	Not occurring	IE	Included elsewhere
NE	Not estimated	C	Confidential
NA	Not applicable	“0”	Estimates that are less than one half of the unit being used to record the inventory table

<sup>3</sup> For some Parties, identification of key sources at that level of detail was not possible due to insufficient reporting of disaggregated data. For these Parties, key sources have been identified at the level of category disaggregation provided in Summary table 1.A of the CRF (corresponding to summary Table 7A of the IPCC Guidelines).

<sup>4</sup> Emissions and removals associated with land–use change and forestry are not covered in the current edition of the IPCC good practice guidance. A separate IPCC report on good practice guidance for land use, land–use change and forestry is in preparation.

16. The following chemical formulae or abbreviations for greenhouse gases are used in the synthesis and assessment report:

C	carbon
CF <sub>4</sub>	perfluoromethane
C <sub>2</sub> F <sub>6</sub>	perfluoroethane
C <sub>3</sub> F <sub>8</sub>	perfluoropropane
C <sub>4</sub> F <sub>10</sub>	perfluorobutane
c-C <sub>4</sub> F <sub>8</sub>	perfluorocyclobutane
C <sub>5</sub> F <sub>12</sub>	perfluoropentane
C <sub>6</sub> F <sub>14</sub>	perfluorohexane
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
HFCs	hydrofluorocarbons
N <sub>2</sub> O	nitrous oxide
PFCs	perfluorocarbons
SF <sub>6</sub>	sulphur hexafluoride

17. To indicate the methods and emission factors used by Parties the following abbreviations have been used (see also footnotes to Summary table 3 of the CRF) in the synthesis and assessment report:

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

18. The following units have been used in the synthesis and assessment report:

kg	kilogram (10 <sup>3</sup> grams)
t	tonne (10 <sup>6</sup> grams)
Mg	megagram (10 <sup>6</sup> grams) – same as tonne
kt	kilotonne (10 <sup>9</sup> grams) – same as kilotonne
Gg	gigagram (10 <sup>9</sup> grams)
Mt	megatonne (10 <sup>12</sup> grams)
TJ	terajoule (10 <sup>12</sup> joules)
PJ	petajoule (10 <sup>15</sup> joules)
Gg CO <sub>2</sub> equ	Gg of CO <sub>2</sub> equivalent
ha	hectare
kha	thousand hectares
Mha	million hectares
MM Bbl/yr	million barrels per year
TBtu	trillion British thermal units

19. The following other abbreviations have been used in the synthesis and assessment report:

CRF	common reporting format
NIR	national inventory report
A	actual emissions
P	potential emissions
AD	activity data
EF	emission factor
IEF	implied emission factor
GHG	greenhouse gas
GWP	global warming potential
C	carbon
N	nitrogen
NO <sub>x</sub>	nitrogen oxides
NH <sub>3</sub>	ammonia
NCV	net calorific value
GCV	gross calorific value
yr	year
dm	dry matter
Frac <sub>FUEL</sub>	fraction of livestock N excretion in excrements burned for fuel
Frac <sub>GRAZ</sub>	fraction of livestock N excreted and deposited onto soil during grazing
Frac <sub>NCRBF</sub>	fraction of N in non-N-fixing crop
Frac <sub>NCRO</sub>	fraction of N in N-fixing crop
Frac <sub>R</sub>	fraction of crop residue removed from the field as crop
Frac <sub>BURN</sub>	fraction of crop residue burned
Frac <sub>GASF</sub>	fraction of synthetic fertilizer N applied to soils which volatilizes as NH <sub>3</sub> and NO <sub>x</sub>
Frac <sub>GASM</sub>	fraction of livestock N excretion that volatilizes as NH <sub>3</sub> and NO <sub>x</sub>
Frac <sub>LEACH</sub>	fraction of N input to soils which is lost through leaching and run-off
L	level (key source applying the IPCC good practice guidance tier 1 level assessment)
LPG	liquefied petroleum gas
LTO	landing and take off cycle
NMVOC	non-methane volatile organic compounds
T	trend (key source applying the IPCC good practice guidance tier 1 trend assessment)
FAO	Food and Agriculture Organization of the United Nations
IEA	International Energy Agency
NGL	natural gas liquids

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	Relative change (%)
	Ratio: kg CH <sub>4</sub> /capita
	Relative change (%)
	N <sub>2</sub> O emissions (Gg)
	Relative change (%)
	Ratio: kg N <sub>2</sub> O /capita
	Relative change (%)