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Tenth session

Bonn, 31 May - 11 June 1999

Agenda item 4 (a)

**NATIONAL COMMUNICATIONS FROM PARTIES INCLUDED IN  
ANNEX I TO THE CONVENTION**

**GUIDELINES FOR THE PREPARATION OF  
NATIONAL COMMUNICATIONS**

**Draft conclusions by the Chairman**

**Addendum**

**COMMON REPORTING FORMAT**

**Notes on the common reporting format**

1. This common reporting format consists of summary, reporting and overview tables from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines), plus newly developed sectoral background tables. Users of IPCC software and of the software for converting from CORINAIR to IPCC formats should be aware that a few small additions have been made to the tables taken from the IPCC Guidelines.

2. Some sectoral background tables call for the calculation of *implied emission factors*. These are top-down ratios between the Party's emissions estimate and aggregate activity data. The implied emission factors are intended solely for purposes of comparison. They will not necessarily be the emission factors actually used in the original emissions estimate, unless of course this was a simple multiplication based on the same aggregate activity data used to calculate the implied emission factor.

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3. Consistent with the IPCC Guidelines memo items, such as emissions estimates from international marine and aviation bunker fuels, should be reported in the appropriate tables, but not included in national totals.
4. Parties should use the documentation boxes provided at the foot of the sectoral background tables to improve clarity.
5. Parties should complete all cells calling for emissions or removals estimates, activity data or emission factors. The following standard indicators should be used where data are not entered.
  - (a) "NO" (not occurring) for emissions by sources and removals by sinks of greenhouse gases that do not occur for a particular gas or source/sink category within a country;
  - (b) "NE" (not estimated) for existing emissions by sources and removal 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 Party should indicate using the completeness table 9, why emissions could not be estimated;
  - (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 common reporting format for which NA is applicable are shaded, they do not need to be filled in;
  - (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 Party should indicate using the completeness table 9, where in the inventory the emissions or removals from the displaced source/sink category have been included and the Party should give the reasons for this inclusion deviating from the expected category;
  - (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 19 of the UNFCCC reporting guidelines on annual inventories;
  - (f) "0" for emissions by sources and removals by sinks of greenhouse gases which are estimated to be less than one half the unit being used to record the inventory table, and which would therefore appear as zero after rounding. The amount should still be included in the relevant subtotals. In the sectoral background tables, Parties should provide data as detailed as methods allow.
6. Parties should complete the data in the additional information boxes. Where the information called for is inappropriate because of the methodological tier used by the Party, the corresponding cells should be completed using the indicator NA.

7. Table 5 (the land-use change and forestry sectoral report) should be completed by Parties. The corresponding sectoral background tables 5 A-D follow the IPCC Guidelines and should be completed by Parties that use IPCC default methods. The species and ecosystem types given in the background tables are examples and may be changed by Parties to better describe national circumstances. Parties which do not use the sectoral background tables 5 A-D should complete alternative formats, when they are available.
8. Neither the order nor the notation of columns, rows or cells should be changed in the tables because this will complicate data compilation. Any additions to the existing disaggregation of source and sink categories should be made using the spare rows and columns provided. Additional changes that are made should be clearly indicated both by using a red font and by underlining the information contained in changed cells.
9. Where recalculations of previously submitted data are necessary for the reasons set out in paragraphs 10 and 11 of the UNFCCC reporting guidelines on annual inventories, Parties should complete recalculation table 8a for every year from the base year, and table 8b. Parties should also complete the other tables of the common reporting format for the base year which have changed due to the recalculations.

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**SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)**  
**(Sheet 1 of 3)**

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> Emissions	CO <sub>2</sub> Removals	CH <sub>4</sub>	N <sub>2</sub> O	HFCs <sup>(1)</sup>		PFCs <sup>(1)</sup>		SF <sub>6</sub>		NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
					P	A	P	A	P	A				
Total National Emissions and Removals														
1. Energy														
A. Fuel Combustion (Sectoral Approach)														
1. Energy Industries														
2. Manufacturing Industries and Construction														
3. Transport														
4. Other Sectors														
5. Other (please specify)														
B. Fugitive Emissions from Fuels														
1. Solid Fuels														
2. Oil and Natural Gas														
2. Industrial Processes														
A. Mineral Products														
B. Chemical Industry														
C. Metal Production														
D. Other Production														
E. Production of Halocarbons and Sulphur Hexafluoride														
F. Consumption of Halocarbons and Sulphur Hexafluoride														
G. Other (please specify)														

P = Potential emissions based on Tier 1 Approach.

A = Actual emissions based on Tier 2 Approach.

<sup>(1)</sup> The emissions of HFCs and PFCs are to be expressed as CO<sub>2</sub> equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

**SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)**  
**(Sheet 2 of 3)**

Year :

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES														
CO <sub>2</sub> equivalent emissions (Gg)														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> Emissions	CO <sub>2</sub> Removals	CH <sub>4</sub>	N <sub>2</sub> O	HFCs		PFCs		SF <sub>6</sub>		NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
					P	A	P	A	P	A				
					CO <sub>2</sub> -eq. (Gg)									
<b>3. Solvent and Other Product Use</b>														
<b>4. Agriculture</b>														
A. Enteric Fermentation														
B. Manure Management														
C. Rice Cultivation	(1)													
D. Agricultural Soils														
E. Prescribed Burning of Savannas														
F. Field Burning of Agricultural Residues														
G. Other (please specify)														
<b>5. Land-Use Change and Forestry</b>	(1)	(1)												
A. Changes in Forest and Other Woody Biomass Stocks	(1)													
B. Forest and Grassland Conversion														
C. Abandonment of Managed Lands	(1)													
D. CO <sub>2</sub> Emissions and Removals from Soil	(1)													
E. Other (please specify)														
<b>6. Waste</b>														
A. Solid Waste Disposal on Land														
B. Wastewater Handling														
C. Waste Incineration		(2)												
D. Other (please specify)														
<b>7. Other (please specify)</b>														

(1) Please do not provide an estimate of both CO<sub>2</sub> emissions and CO<sub>2</sub> removals. You should estimate "net" emissions of CO<sub>2</sub> and place a single number in either the CO<sub>2</sub> emissions or CO<sub>2</sub> removals column, as appropriate. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

(2) Note that CO<sub>2</sub> from waste incineration should only be included if it stems from non-biogenic or inorganic waste streams.

Year :

**SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)**  
**(Sheet 3 of 3)**

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> Emissions	CO <sub>2</sub> Removals	CH <sub>4</sub>	N <sub>2</sub> O	HFCs		PFCs		SF <sub>6</sub>		NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
					P	A	P	A	P	A				
					CO <sub>2</sub> equivalent (Gg)									
<b>Memo Items <sup>(1)</sup></b>														
<b>International Bunkers</b>														
Aviation														
Marine														
<b>Multilateral Operations</b>														
<b>CO<sub>2</sub> Emissions from Biomass</b>														

<sup>(1)</sup> Memo Items are not included in the national totals.



**SUMMARY 1.B SHORT SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7B)**  
(Sheet 1 of 1)

Year :

SHORT SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES															
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> Emissions	CO <sub>2</sub> Removals	CH <sub>4</sub>	N <sub>2</sub> O	HFCs <sup>(1)</sup>		PFCs <sup>(1)</sup>		SF <sub>6</sub>		NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>	
					P	A	P	A	P	A					
		(Gg)				CO <sub>2</sub> -eq. (Gg)		CO <sub>2</sub> -eq. (Gg)				(Gg)			
<b>Total National Emissions and Removals</b>															
<b>1. Energy</b>															
Reference Approach <sup>(2)</sup>															
Sectoral Approach <sup>(2)</sup>															
A. Fuel Combustion															
B. Fugitive Emissions from Fuels															
<b>2. Industrial Processes</b>															
<b>3. Solvent and Other Product Use</b>															
<b>4. Agriculture</b>															
<b>5. Land-Use Change and Forestry</b>	( <sup>3</sup> )	( <sup>3</sup> )													
<b>6. Waste</b>															
<b>7. Other</b>															
<b>Memo Items:</b>															
<b>International Bunkers</b>															
Aviation															
Marine															
<b>Multilateral Operations</b>															
<b>CO<sub>2</sub> Emissions from Biomass</b>															

P = Potential emissions based on Tier 1 Approach.

A = Actual emissions based on Tier 2 Approach.

(<sup>1</sup>) The emissions of HFCs and PFCs are to be expressed as CO<sub>2</sub> equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

(<sup>2</sup>) For verification purposes, countries are asked to report the results of their calculations using the Reference Approach and to explain any differences with the Sectoral Approach. Calculations using the Sectoral Approach should be used for calculating national totals. Do not include the results of both the Reference Approach and the Sectoral Approach in national totals.

(<sup>3</sup>) Please do not provide an estimate of both CO<sub>2</sub> emissions and CO<sub>2</sub> removals. You should estimate "net" emissions of CO<sub>2</sub> and place a single number in either the CO<sub>2</sub> emissions or CO<sub>2</sub> removals column, as appropriate. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

SUMMARY 2 CO<sub>2</sub> EQUIVALENT EMISSIONS SUMMARY REPORT

(Sheet 1 of 1)

GHG Source and Sink Categories	CO <sub>2</sub> equivalent emissions (Gg)						
	CO <sub>2</sub> <sup>(1)</sup>	CH <sub>4</sub>	N <sub>2</sub> O	HFC	PFC	SF <sub>6</sub>	Total
<b>CO<sub>2</sub> equivalent emissions (Gg)</b>							
<b>Total (net emissions)<sup>(1)</sup></b>							
<b>1. Energy</b>							
A. Fuel Combustion (Sectoral Approach)							
1. Energy Industries							
2. Manufacturing Industries and Construction							
3. Transport							
4. Other Sectors							
5. Other							
B. Fugitive Emissions from Fuels							
1. Solid Fuels							
2. Oil and Natural Gas							
<b>2. Industrial Processes</b>							
A. Mineral Products							
B. Chemical Industry							
C. Metal Production							
D. Other Production							
E. Production of Halocarbons and SF <sub>6</sub>							
F. Consumption of Halocarbons and SF <sub>6</sub>							
G. Other							
<b>3. Solvent and Other Product Use</b>							
<b>4. Agriculture</b>							
A. Enteric Fermentation							
B. Manure Management							
C. Rice Cultivation							
D. Agricultural Soils							
E. Prescribed Burning of Savannas							
F. Field Burning of Agricultural Residues							
G. Other							
<b>5. Land-Use Change and Forestry<sup>(1)</sup></b>							
<b>6. Waste</b>							
A. Solid Waste Disposal on Land							
B. Wastewater Handling							
C. Waste Incineration							
D. Other							
<b>7. Other (please specify)</b>							
<b>Memo Items</b>							
<b>International Bunkers</b>							
Aviation							
Marine							
<b>Multilateral Operations</b>							
<b>CO<sub>2</sub> Emissions from Biomass</b>							

<sup>(1)</sup> For CO<sub>2</sub> emissions from Land-Use Change and Forestry (LUCF) the net emissions (emissions - removals) are to be reported. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

GHG Source and Sink Categories	CO <sub>2</sub> equivalent emissions (Gg)					
	CO <sub>2</sub> emissions	CO <sub>2</sub> removals	Net CO <sub>2</sub> emissions / removals	CH <sub>4</sub>	N <sub>2</sub> O	Total emissions
<b>Land-Use Change and Forestry</b>						
A. Changes in Forest and Other Woody Biomass Stocks						
B. Forest and Grassland Conversion						
C. Abandonment of Managed Lands						
D. CO <sub>2</sub> Emissions and Removals from Soil						
<b>Total CO<sub>2</sub> equivalent emissions from LUCF</b>						

Total CO<sub>2</sub> equivalent emissions without Land-Use Change and Forestry<sup>(a)</sup>

Total CO<sub>2</sub> equivalent emissions with Land-Use Change and Forestry<sup>(a)</sup>

<sup>(a)</sup> The information in these rows is requested to facilitate comparison of data, since Parties differ in the way they report emissions and removals from Land-Use Change and Forestry.

**SUMMARY 3 SUMMARY REPORT ON METHODS AND EMISSION FACTORS USED**  
(Sheet 1 of 2)

**SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		HFCs		PFCs		SF <sub>6</sub>	
	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)
<b>1. Energy</b>												
A. Fuel Combustion (Sectoral Approach)												
1. Energy Industries												
2. Manufacturing Industries and Construction												
3. Transport												
4. Other Sectors												
5. Other (please specify)												
B. Fugitive Emissions from Fuels												
1. Solid Fuels												
2. Oil and Natural Gas												
<b>2. Industrial Processes</b>												
A. Mineral Products												
B. Chemical Industry												
C. Metal Production												
D. Other Production												
E. Production of Halocarbons and Sulphur Hexafluoride												
F. Consumption of Halocarbons and Sulphur Hexafluoride												
G. Other (please specify)												

(1) Use the following notation keys to specify the method applied: D (default IPCC), RA (Reference Approach), T1 (IPCC Tier 1), T1a, T1b, T1c (IPCC Tier 1a, Tier 1b and Tier 1c, respectively), T2 (IPCC Tier 2), T3 (IPCC Tier 3), C (CORINAIR), CS (Country Specific), M (Model). If using more than one method, enumerate the relevant methods. Explanations of any modifications to the default IPCC methods, as well as information on the proper use of methods per source category where more than one method is indicated and explanations on the country specific methods, should be provided in the documentation box of the relevant Sectoral Background Data Table.

(2) Use the following notation keys to specify the emission factor used: D (IPCC default), C (CORINAIR), CS (Country Specific), PS (Plant Specific), M (Model). Where a mix of emission factors has been used, use different notations in one and the same cells with further explanation in the documentation box of the relevant Sectoral Background Data Table.

**SUMMARY 3 SUMMARY REPORT ON METHODS AND EMISSION FACTORS USED**  
(Sheet 2 of 2)

**SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		HFCs		PFCs		SF <sub>6</sub>	
	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)	Method Applied (1)	Emission Factor (2)
<b>3. Solvent and Other Product Use</b>												
<b>4. Agriculture</b>												
A. Enteric Fermentation												
B. Manure Management												
C. Rice Cultivation												
D. Agricultural Soils												
E. Prescribed Burning of Savannas												
F. Field Burning of Agricultural Residues												
G. Other (please specify)												
<b>5. Land-Use Change and Forestry</b>												
A. Changes in Forest and Other Woody Biomass Stocks												
B. Forest and Grassland Conversion												
C. Abandonment of Managed Lands												
D. CO <sub>2</sub> Emissions and Removals from Soil												
E. Other (please specify)												
<b>6. Waste</b>												
A. Solid Waste Disposal on Land												
B. Wastewater Handling												
C. Waste Incineration												
D. Other (please specify)												
<b>7. Other (please specify)</b>												

<sup>(1)</sup> Use the following notification keys to specify the method applied: D (default IPCC), RA (Reference Approach), T1 (IPCC Tier 1), T1a, T1b, T1c (IPCC Tier 1a, Tier 1b and Tier 1c, respectively), T2 (IPCC Tier 2), T3 (IPCC Tier 3), C (CORINAIR), CS (Country Specific), M (Model). If using more than one method, enumerate the relevant methods. Explanations of any modifications to the default IPCC methods, as well as information on the proper use of methods per source category where more than one method is indicated and explanations on the country specific methods, should be provided in the documentation box of the relevant Sectoral Background Data Table.

<sup>(2)</sup> Use the following notation keys to specify the emission factor used: D (IPCC default), C (CORINAIR), CS (Country Specific), PS (Plant Specific), M (Model). Where a mix of emission factors has been used, use different notations in one and the same cells with further explanation in the documentation box of the relevant Sectoral Background Data Table.

**TABLE 1 SECTORAL REPORT FOR ENERGY**  
(Sheet 1 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NM VOC	SO <sub>2</sub> <sup>(1)</sup>
Total Energy							
<b>A. Fuel Combustion Activities (Sectoral Approach)</b>							
<b>1. Energy Industries</b>							
a. Public Electricity and Heat Production							
b. Petroleum Refining							
c. Manufacture of Solid Fuels and Other Energy Industries							
<b>2. Manufacturing Industries and Construction</b>							
a. Iron and Steel							
b. Non-Ferrous Metals							
c. Chemicals							
d. Pulp, Paper and Print							
e. Food Processing, Beverages and Tobacco							
f. Other (please specify)							
<b>3. Transport</b>							
a. Civil Aviation							
b. Road Transportation							
c. Railways							
d. Navigation							
e. Other (please specify)							

**TABLE 1 SECTORAL REPORT FOR ENERGY**  
(Sheet 2 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NM VOC	SO <sub>2</sub>
<b>4. Other Sectors</b>							
a. Commercial/Institutional							
b. Residential							
c. Agriculture/Forestry/Fishing							
<b>5. Other (please specify)<sup>(1)</sup></b>							
a. Stationary							
b. Mobile							
<b>B. Fugitive Emissions from Fuels</b>							
<b>1. Solid Fuels</b>							
a. Coal Mining							
b. Solid Fuel Transformation							
c. Other (please specify)							
<b>2. Oil and Natural Gas</b>							
a. Oil							
b. Natural Gas							
c. Venting and Flaring							
Venting							
Flaring							
Other (please specify)							
<b>Memo Items<sup>(2)</sup></b>							
<b>International Bunkers</b>							
Aviation							
Marine							
<b>Multilateral Operations</b>							
<b>CO<sub>2</sub> Emissions from Biomass</b>							

<sup>(1)</sup> Include military fuel use under this category.

<sup>(2)</sup> Please do not include in energy totals.

**TABLE I.A SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fuel combustion activities (Sectoral approach)**  
**(Sheet 1 of 4)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS <sup>(1)</sup>				EMISSIONS		
	Consumption (TJ)	<sup>(3)</sup>	CO <sub>2</sub> (t/TJ)	CH <sub>4</sub> (kg/TJ)	N <sub>2</sub> O (kg/TJ)	CO <sub>2</sub> <sup>(2)</sup> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)	
<b>I.A. FUEL COMBUSTION</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass <sup>(2)</sup>									
Other fuels									
<b>I.A.1. Energy Industries</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
a. Public Electricity and Heat Production									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
b. Petroleum Refining									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
c. Manufacture of Solid Fuels and Other Energy Industries									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									

<sup>(1)</sup> Accurate estimation of CH<sub>4</sub> and N<sub>2</sub>O emissions depends on combustion conditions, technology, and emission control policy, as well as fuel characteristics. Therefore, caution should be used when comparing the implied emission factors.

<sup>(2)</sup> Carbon dioxide emissions from biomass are reported under memo items.

<sup>(3)</sup> Activity data should be calculated using net calorific values (NCV) as specified by the Revised 1996 IPCC Guidelines. If gross calorific values (GCV) were used, please indicate this by placing a "G" in this column.

**Note:** For the coverage of fuel categories, please refer to the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1 (Common Reporting Framework, section 1.2, p. 1.19).

**TABLE 1.A SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fuel combustion activities (Sectoral approach)**  
**(Sheet 2 of 4)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS				EMISSIONS		
	Consumption (TJ)	(1)	CO <sub>2</sub> (t/TJ)	CH <sub>4</sub> (kg/TJ)	N <sub>2</sub> O (kg/TJ)	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)	
<b>1.A.2 Manufacturing Industries and Construction</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>a. Iron and Steel</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>b. Non-Ferrous Metals</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>c. Chemicals</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>d. Pulp, Paper and Print</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>e. Food Processing, Beverages and Tobacco</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									
<b>f. Other (please specify)</b>									
Liquid Fuels									
Solid Fuels									
Gaseous Fuels									
Biomass									
Other fuels									

(1) Activity data should be calculated using net calorific values (NCV) as specified by the Revised 1996 IPCC Guidelines. If gross calorific values (GCV) are used, please indicate this by placing a "G" in this column.

(2) Carbon dioxide emissions from biomass are reported under memo items.



**TABLE 1.A SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fuel combustion activities (Sectoral approach)**  
**(Sheet 3 of 4)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS			EMISSIONS		
	Consumption (TJ)	Consumption (TJ) <sup>(1)</sup>	CO <sub>2</sub> (t/TJ)	CH <sub>4</sub> (kg/TJ)	N <sub>2</sub> O (kg/TJ)	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)
<b>I.A.3 Transport</b>								
Gasoline								
Diesel								
Natural gas								
Solid Fuels								
Biomass								
Other fuels (please specify)								
<b>a. Civil Aviation</b>								
Gasoline								
Jet Kerosene								
<b>b. Road Transportation</b>								
Gasoline								
Diesel oil								
Natural gas								
Biomass								
Other fuels (please specify)								
<b>c. Railways</b>								
Solid fuels								
Liquid fuels								
<b>d. Navigation</b>								
Coal								
Residual oil								
Other fuels (please specify)								
<b>e. Other Transportation</b>								
Liquid fuels								
Solid fuels								
Gaseous fuels								

<sup>(1)</sup> Activity data should be calculated using net calorific values (NCV) as specified by the Revised 1996 IPCC Guidelines. If gross calorific values (GCV) are used, please indicate this by placing a "G" in this column.

**TABLE 1.A SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fuel combustion activities (Sectoral approach)**  
**(Sheet 4 of 4)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS			EMISSIONS		
	Consumption (TJ)	<sup>(1)</sup>	CO <sub>2</sub> (t/TJ)	CH <sub>4</sub> (kg/TJ)	N <sub>2</sub> O (kg/TJ)	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)
<b>1.A.4 Other Sectors</b>								
Liquid Fuels								
Solid Fuels								
Gaseous Fuels								
Biomass								
Other fuels								
<b>a. Commercial/Institutional</b>								
Liquid Fuels								
Solid Fuels								
Gaseous Fuels								
Biomass								
Other fuels								
<b>b. Residential</b>								
Liquid Fuels								
Solid Fuels								
Gaseous Fuels								
Biomass								
Other fuels								
<b>c. Agriculture/Forestry/Fishing</b>								
Liquid Fuels								
Solid Fuels								
Gaseous Fuels								
Biomass								
Other fuels								
<b>1.A.5 Other (Not elsewhere specified)<sup>(1)</sup></b>								
Liquid Fuels								
Solid Fuels								
Gaseous Fuels								
Biomass								
Other fuels								

<sup>(1)</sup> Activity data should be calculated using net calorific values (NCV) as specified by the Revised 1996 IPCC Guidelines. If gross calorific values (GCV) are used, please indicate this by placing a "G" in this column.

<sup>(2)</sup> Include military fuel use under this category.

**Documentation box:**

**TABLE 1.B.1 SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fugitive emissions from solid fuels**  
**(Sheet 1 of 1)**

Year :

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTOR		EMISSIONS	
		Amount of fuel produced <sup>(1)</sup> (Mt)	CH <sub>4</sub> (kg/t)	CO <sub>2</sub> (kg/t)	CH <sub>4</sub> (Gg)
<b>I. B. 1. a. Coal Mining and Handling</b>					
i. Underground Mines <sup>(2)</sup>					
Mining activities					
Post-Mining activities					
ii. Surface Mines <sup>(2)</sup>					
Mining activities					
Post-Mining activities					
<b>I. B. 1. b. Solid Fuel Transformation</b>					
<b>I. B. 1. c. Other (please specify)<sup>(3)</sup></b>					

**Additional Information**

Types of coal mined in different type of mines (class/rank of coal)	Percentage from the given	
	underground	surface
Anthracite		
Coking coal		
Other bituminous coal		
Sub-bituminous coal		
Lignite		

Amount of CH <sub>4</sub> recovered and utilized (Gg) <sup>(a)</sup> :	
Mines with recovery systems (number)	

<sup>(a)</sup> for underground mines.

<sup>(1)</sup> Specify whether the fuel amount is based on the run-of-mine (ROM) production or on the saleable production.

<sup>(2)</sup> Emissions for "Mining Activities" and "Post-Mining Activities" are calculated with the activity data in lines "Underground Mines" and "Surface Mines" respectively.

<sup>(3)</sup> Use the "Other" rows to enter any other solid fuel related activities resulting in fugitive emissions.

**Note:** There are no clear references to the coverage of I.B.1.b. and I.B.1.c. in the Revised 1996 IPCC Guidelines. Make sure that the emissions entered here are not reported elsewhere. If they are reported under another source category, give reference in the documentation box.

**Documentation box:**

**TABLE 1.B.2 SECTORAL BACKGROUND DATA FOR ENERGY**  
**Fugitive emissions from oil and natural gas**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS				EMISSIONS		
	Description <sup>(1)</sup>	value	CO <sub>2</sub> (kg/PJ) <sup>(2)</sup>	CH <sub>4</sub> (kg/PJ) <sup>(2)</sup>	N <sub>2</sub> O (kg/PJ) <sup>(2)</sup>	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)	
<b>1. B. 2. a. Oil <sup>(3)</sup></b>									
i. Exploration	(e.g. number of wells drilled)								
ii. Production <sup>(4)</sup>	(e.g. PJ of oil produced)								
iii. Transport	(e.g. PJ oil loaded in tankers)								
iv. Refining / Storage	(e.g. PJ oil refined)								
v. Distribution of oil products	(e.g. PJ oil refined)								
vi. Other									
<b>1. B. 2. b. Natural Gas</b>									
Exploration									
i. Production <sup>(4)</sup> / Processing	(e.g. PJ gas produced)								
ii. Transmission	(e.g. PJ gas consumed)								
Distribution	(e.g. PJ gas consumed)								
iii. Other Leakage	(e.g. PJ gas consumed)								
<i>at industrial plants and power stations in residential and commercial sectors</i>									
<b>1. B. 2. c. Venting <sup>(5)</sup></b>									
i. Oil	(e.g. PJ oil produced)								
ii. Gas	(e.g. PJ gas produced)								
iii. Combined									
<b>Flaring</b>									
i. Oil	(e.g. PJ gas consumption)								
ii. Gas	(e.g. PJ gas consumption)								
iii. Combined									
<b>1.B.2.d. Other (please specify) <sup>(6)</sup></b>									

**Additional Information**

Unit	value
Pipelines length (km)	
Number of oil wells	
Other relevant information (specify)	

<sup>(1)</sup> Specify the activity data used and fill in the activity data unit column, as given in the examples in brackets. Specify whether the fuel amount is based on the saleable production or on the raw material production. Note cases where more than one variable is used as activity data.

<sup>(2)</sup> Specify the unit of the implied emission factor where it is not kg GHG/ PJ.

<sup>(3)</sup> Use the category also to cover emissions from combined oil and gas production fields. Natural gas processing and distribution from these fields should be included under 1.B.2.b.ii and 1.B.2.b.iii, respectively.

<sup>(4)</sup> If using default emission factors these categories will include emissions from production other than venting and flaring.

<sup>(5)</sup> If using default emission factors, emissions from venting and flaring from all oil and gas production should be accounted for here. Parties using the IPCC software could report those emissions together, indicating so in the documentation box.

<sup>(6)</sup> For example, fugitive CO<sub>2</sub> emissions from production of geothermal power could be reported here.

**Documentation box:**

Year :

**WORKSHEET 1-1**  
**CO<sub>2</sub> from energy sources (Reference approach)**  
**(Sheet 1 of 1)**

FUEL TYPES		Production	Imports	Exports	International Bunkers	Stock Change	Apparent Consumption	Conversion Factor <sup>(1)</sup> (TJ/Unit)	Apparent Consumption (TJ)	Carbon Emission Factor (t C/TJ)	Carbon Content (Gg C)	Carbon Stored (Gg C)	Net Carbon Emissions (Gg C)	Fraction of Carbon Oxidized	Actual CO <sub>2</sub> Emissions (Gg CO <sub>2</sub> )	
Liquid Fossil	Primary Fuels	Crude Oil														
		Orimulsion														
	Secondary Fuels	Natural Gas Liquids														
		Gasoline														
		Jet Kerosene														
		Other Kerosene														
		Shale Oil														
		Gas / Diesel Oil														
		Residual Fuel Oil														
		LPG														
		Ethane														
		Naphtha														
		Bitumen														
		Lubricants														
		Petroleum Coke														
		Refinery Feedstocks														
Other Oil																
Liquid Fossil Totals																
Solid Fossil	Primary Fuels	Anthracite <sup>(2)</sup>														
		Coking Coal														
	Secondary Fuels	Other Bit. Coal														
		Sub-bit. Coal														
		Lignite														
		Oil Shale														
		Peat														
BKB & Patent Fuel																
Coke Oven/Gas Coke																
Solid Fuel Totals																
Gaseous Fossil																
Total																
Biomass total																
Biomass	Fuels	Solid Biomass														
		Liquid Biomass														
		Gas Biomass														

<sup>(1)</sup> To convert quantities expressed in natural units to energy units, use the net calorific values. If gross calorific values (GCV) are used in this table, please indicate this with a footnote.  
<sup>(2)</sup> If anthracite is not separately available, include with Other Bituminous Coal.

**TABLE 1.C SECTORAL BACKGROUND DATA FOR ENERGY  
Feedstocks and non-energy use of fuels  
(Sheet 1 of 1)**

Fuel type <sup>(1)</sup>	ACTIVITY DATA		IMPLIED EMISSION FAC		ESTIMATES Carbon Stored (Gg C)
	Fuel Quantity (TJ)	Fraction of Carbon Stored	Carbon Emission Factor (t C/TJ)	Carbon Stored	
Naphtha <sup>(2)</sup>					
Lubricants					
Bitumen					
Coal Oils and Tars (from Coking Coal)					
Natural Gas <sup>(2)</sup>					
Gas/Diesel Oil <sup>(2)</sup>					
Propane <sup>(2)</sup>					
Butane <sup>(2)</sup>					
Ethane <sup>(2)</sup>					
Other (specify)					

<sup>(1)</sup> Where fuels are used in different industries, please enter in different rows.

<sup>(2)</sup> Enter these fuels when they are used as feedstocks.

**Note:** The table is consistent with the IPCC Guidelines. Parties that take into account the emissions associated with the use and disposal of these feedstocks could continue to use their methodologies, and provide explanation notes in the documentation box below.

**Documentation box:** A fraction of energy carriers is stored in such products as plastics or asphalt. The non-stored fraction of the carbon in the energy carrier or product is oxidized, resulting in carbon dioxide emissions, either during the use of the energy carriers in the industrial production (e.g. fertilizer production), or during use of the products (e.g. solvents, lubricants), or in both (e.g. monomers). To report associated emissions use the above table, filling an extra "Additional Information" table, as shown below:

Associated CO <sub>2</sub> emissions (Gg)	Allocated under (Specify source category) <sup>(a)</sup>

<sup>(a)</sup> e.g. industrial processes, waste incineration, etc.

Additional Information <sup>(a)</sup>	
CO <sub>2</sub> not emitted (Gg CO <sub>2</sub> )	Subtracted from (specify source category)

<sup>(a)</sup> The fuel lines continue from the left side table

Year :

**TABLE 1.D SECTORAL BACKGROUND DATA FOR ENERGY**  
**International bunkers and multilateral operations**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA Consumption (TJ)	IMPLIED EMISSION FACTORS			EMISSIONS		
		CO <sub>2</sub> (t/TJ)	CH <sub>4</sub> (kg/TJ)	N <sub>2</sub> O (kg/TJ)	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)
<b>Marine Bunkers</b>							
Gasoline							
Gas/Diesel Oil							
Residual Fuel Oil							
Lubricants							
Coal							
Other (specify)							
<b>Aviation Bunkers</b>							
Jet Kerosene							
Gasoline							
<b>Multilateral Operations</b> <sup>(1)</sup>							

**Additional Information**

Fuel consumption	Allocation (percent)	
	Domestic	International
Marine		
Aviation		

For calculating the allocation of fuel consumption, use the sums of fuel consumption by domestic navigation and aviation (Table 1.A) and by international bunkers (Table 1.D).

<sup>(1)</sup> Parties may choose to report or not report the activity data and emission factors for multilateral operation consistent with the principle of confidentiality stated in the UNFCCC reporting guidelines on inventories. In any case, Parties should report the emissions from multilateral operations, where available, under the memo items section of the Summary tables and in the Sectoral Report table for energy.

**Note:** In accordance with the Revised 1996 IPCC Guidelines, international aviation and marine bunker fuel emissions from fuel sold to ships or aircraft engaged in international transport should be excluded from national totals and reported separately for informational purposes only.

**Documentation box:** Please explain how the consumption of international marine and aviation bunkers fuels was estimated and separated from the domestic consumption.

Year :

**TABLE 1.E COMPARISON OF CO<sub>2</sub> EMISSIONS FROM FUEL COMBUSTION**  
(Sheet 1 of 1)

Fuel types	Reference Approach		National Approach <sup>(1)</sup>		Difference <sup>(2)</sup>	
	Energy consumption (PJ)	CO <sub>2</sub> emissions (Gg)	Energy consumption (PJ)	CO <sub>2</sub> emissions (Gg)	Energy consumption (%)	CO <sub>2</sub> emissions (%)
Liquid fuels (excluding international bunkers)						
Solid fuels (excluding international bunkers)						
Gaseous fuels						
Other (specify)						
<b>Total</b>						

<sup>(1)</sup> "National Approach" is used to indicate the approach (different from the Reference Approach) followed by the Party to estimate its CO<sub>2</sub> emissions from fuel combustion reported in the national GHG inventory.

<sup>(2)</sup> Difference of the Reference Approach over the National Approach i.e. difference =  $100 \times ((RA-NA)/NA)$ , where NA = National Approach and RA = Reference Approach.

**Note:** In addition to estimating CO<sub>2</sub> emissions from fuel combustion by sector, Parties should also estimate these emissions using the IPCC Reference Approach, as found in volume 2 of the IPCC Guidelines (Worksheet 1-1). The Reference Approach is to assist in verifying the sectoral data. Parties should also complete the above tables to compare the alternative estimates, and if the estimates lie more than 2 percent apart, should explain the source of this difference in the documentation box provided.

**Documentation box:** Please explain the source of any difference greater than 2 percent.



**TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES**  
(Sheet 1 of 2)

Year :

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES													
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)	HFCs <sup>(1)</sup> CO <sub>2</sub> equivalent (Gg)		PFCs <sup>(1)</sup> CO <sub>2</sub> equivalent (Gg)		SF <sub>6</sub> (Gg)		NO <sub>x</sub> (Gg)	CO (Gg)	NMVOC (Gg)	SO <sub>2</sub> (Gg)
				P	A	P	A	P	A				
<b>Total Industrial Processes</b>													
<b>A. Mineral Products</b>													
1. Cement Production													
2. Lime Production													
3. Limestone and Dolomite Use													
4. Soda Ash Production and Use													
5. Asphalt Roofing													
6. Road Paving with Asphalt													
7. Other (please specify)													
<b>B. Chemical Industry</b>													
1. Ammonia Production													
2. Nitric Acid Production													
3. Adipic Acid Production													
4. Carbide Production													
5. Other (please specify)													
<b>C. Metal Production</b>													
1. Iron and Steel Production													
2. Ferroalloys Production													
3. Aluminium Production													
4. SF <sub>6</sub> Used in Aluminium and Magnesium Foundries													
5. Other (please specify)													

P = Potential emissions based on Tier 1 Approach. A = Actual emissions based on Tier 2 Approach. This only applies in sectors where methods exist for both tiers.  
(1) The emissions of HFCs and PFCs are to be expressed as CO<sub>2</sub> equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

**TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES**  
(Sheet 2 of 2)

Year :

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES												
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs <sup>(1)</sup>		PFCs <sup>(1)</sup>		SF <sub>6</sub>	NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
	(Gg)	(Gg)	(Gg)	P	A	P	A	P	A	(Gg)	(Gg)	(Gg)
				CO <sub>2</sub> equivalent (Gg)								
<b>D. Other Production</b>												
1. Pulp and Paper												
2. Food and Drink <sup>(2)</sup>												
<b>E. Production of Halocarbons and Sulphur Hexafluoride</b>												
1. By-product Emissions <sup>(3)</sup>												
2. Fugitive Emissions												
3. Other (please specify)												
<b>F. Consumption of Halocarbons and Sulphur Hexafluoride</b>												
1. Refrigeration and Air Conditioning Equipment												
2. Foam Blowing												
3. Fire Extinguishers												
4. Aerosols/ Metered Dose Inhalers												
5. Solvents												
6. Other (please specify)												
Semiconductor manufacture												
Electrical equipment												
<b>G. Other (please specify)</b>												

P = Potential emissions based on Tier 1 Approach. A= Actual emissions based on Tier 2 Approach. This only applies in sectors where methods exist for both tiers.

<sup>(1)</sup> The emissions of HFCs and PFCs are to be expressed as CO<sub>2</sub> equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

<sup>(2)</sup> CO<sub>2</sub> from food and drink production (e.g. gasification of water) can be of biological or non-biological origin. Only information on CO<sub>2</sub> emissions of non-biological origin should be reported.

<sup>(3)</sup> Include production of HCFC-22 and other.

**TABLE 2(I).A-G SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES**  
**CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions**  
 (Sheet 1 of 2)

Year :

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS					EMISSIONS		
	Description <sup>(1)</sup>	Production/Consumption Quantity (kt)	CO <sub>2</sub> (t/t)	CH <sub>4</sub> (t/t)	CH <sub>4</sub> <sup>(2)</sup>	N <sub>2</sub> O (t/t)	N <sub>2</sub> O <sup>(2)</sup>	CO <sub>2</sub> (t/t)	CH <sub>4</sub> (t/t)	N <sub>2</sub> O (t/t)
<b>A. Mineral Products</b>										
1. Cement Production	(e.g. cement or clinker production)									
2. Lime Production										
3. Limestone and Dolomite Use										
4. Soda Ash Production and Use										
5. Asphalt Roofing										
6. Road Paving with Asphalt										
7. Other (please specify)										
Glass Production										
<b>B. Chemical Industry</b>										
1. Ammonia Production <sup>(3)</sup>										
2. Nitric Acid Production										
3. Adipic Acid Production										
4. Carbide Production										
silicon carbide										
calcium carbide										
5. Other (please specify)										
carbon black										
ethylene										
dichloroethylene										
styrene										
methanol										
other (please specify)										

<sup>(1)</sup> Where the IPCC Guidelines provide options for activity data, e.g. cement or clinker for estimating the emissions from cement production, specify the activity data used (as shown in the example in brackets) in order to make the choice of emission factor more transparent.

<sup>(2)</sup> Enter "R" to specify cases in which the final emissions reported in the Sectoral Report tables are reduced with the quantities of emission recovery, oxidation, destruction, transformation. The emissions factors before such adjustments should be entered. Parties should include quantitative information on recovery, oxidation, destruction, and transformation in inventory documentation.

<sup>(3)</sup> To avoid double counting make offsetting deductions from fuel consumption (e.g. natural gas) in ammonia production, first for feedstock use of the fuel, and then to a sequestering use of the feedstock.

Year :

**TABLE 2(I)-A-G SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES  
CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions  
(Sheet 2 of 2)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS				EMISSIONS			
	Description <sup>(1)</sup>	Production/Consumption Quantity (kt)	CO <sub>2</sub> (t/t) <sup>(2)</sup>	CH <sub>4</sub> (t/t) <sup>(2)</sup>	N <sub>2</sub> O (t/t) <sup>(2)</sup>	CO <sub>2</sub> (t/t)	CH <sub>4</sub> (t/t)	N <sub>2</sub> O (t/t)		
<b>C. Metal Production<sup>(3)</sup></b>										
1. Iron and Steel Production										
steel										
pig iron										
sinter										
coke										
2. Ferroalloys Production										
3. Aluminium Production										
5. Other (please specify)										
<b>D. Other Production</b>										
1. Pulp and Paper										
2. Food and Drink										
<b>G. Other (please specify)</b>										

<sup>(1)</sup> Where the IPCC Guidelines provide options for activity data, e.g. cement or clinker for estimating the emissions from cement production, specify the activity data used (as shown in the example in brackets) in order to make the choice of emission factor more transparent.

<sup>(2)</sup> Enter "R" to specify cases in which the final emissions reported in the Sectoral Report tables are reduced, with the quantities of emission recovery, oxidation, destruction or transformation. The emission factors before such adjustments should be entered. Parties should include quantitative information on recovery, oxidation, destruction, and transformation in inventory documentation.

<sup>(3)</sup> More specific information (e.g. data on virgin and recycled steel production) could be provided in the documentation box.

Note: In case of confidentiality of the activity data information, the entries should provide aggregate figures but there should be a note indicating this.

Documentation box:

**TABLE 2(II) SECTORAL REPORT FOR INDUSTRIAL PROCESSES**  
**Emissions of HFCs, PFCs and SF<sub>6</sub>**  
**(Sheet 1 of 2)**

Year :

(i) SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES																									
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFC-23	HFC-32	HFC-41	HFC-43-10mee	HFC-125	HFC-134	HFC-134a	HFC-152a	HFC-143	HFC-143a	HFC-227ea	HFC-236fa	HFC-245ca	Total HFCs	CF <sub>4</sub>	C <sub>2</sub> F <sub>6</sub>	C <sub>3</sub> F <sub>8</sub>	C <sub>4</sub> F <sub>10</sub>	C <sub>4</sub> F <sub>8</sub>	C <sub>5</sub> F <sub>12</sub>	C <sub>6</sub> F <sub>14</sub>	Total PFCs	SF <sub>6</sub>		
	<b>C. Metal Production</b>																								
Aluminium Production																									
SF <sub>6</sub> Used in Aluminium Foundries																									
SF <sub>6</sub> Used in Magnesium Foundries																									
<b>E. Production of Halocarbons and SF<sub>6</sub></b>																									
1. By-product Emissions (Specify production)																									
Production of HCFC-22																									
Other																									
2. Fugitive Emissions																									
3. Other (please specify)																									
<b>F. Consumption of Halocarbons and SF<sub>6</sub> (actual emissions)</b>																									
1. Refrigeration and Air Conditioning Equipment																									
2. Foam Blowing																									
3. Fire Extinguishers																									
4. Aerosols/Metered Dose Inhalers																									
5. Solvents																									
6. Semiconductor manufacture																									
7. Electrical equipment																									
8. Other (please specify)																									
Total																									

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this. Other gases with GWP not yet agreed upon by the COP, should be reported in Table 9 (Completeness), sheet 2.

**TABLE 2(II) SECTORAL REPORT FOR INDUSTRIAL PROCESSES**  
Emissions of HFCs, PFCs and SF<sub>6</sub>  
(Sheet 2 of 2)

Year :

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES																									
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFC-23	HFC-32	HFC-41	HFC-43-10mee	HFC-125	HFC-134	HFC-134a	HFC-152a	HFC-143	HFC-143a	HFC-227ea	HFC-236fa	HFC-245ca	Total HFCs	CF <sub>4</sub>	C <sub>2</sub> F <sub>6</sub>	C <sub>3</sub> F <sub>8</sub>	C <sub>4</sub> F <sub>10</sub>	C-C <sub>4</sub> F <sub>8</sub>	C <sub>5</sub> F <sub>12</sub>	C <sub>6</sub> F <sub>14</sub>	Total PFCs	SF <sub>6</sub>		
	<b>Consumption of Halocarbons and SF<sub>6</sub> (potential emissions) <sup>(1)</sup></b>																								
production																									
production of new substance																									
recycled substance																									
import: in bulk																									
in products <sup>(2)</sup>																									
export: in bulk																									
in products <sup>(2)</sup>																									
destroyed amount																									
<b>GWP values used</b>	11700	650	150	1300	2800	1000	1300	140	300	3800	2900	6300	560	6500	9200	7000	8700	7500	7400					23900	
<b>Actual emissions (Gg CO<sub>2</sub> eq.)</b>																									
C Metal Production																									
E Production of Halocarbons and SF <sub>6</sub>																									
F Consumption of Halocarbons and SF <sub>6</sub>																									
<b>Potential emissions from consumption of halocarbons and SF<sub>6</sub> (Gg CO<sub>2</sub> eq.)</b>																									
<b>Consumption of halocarbons and SF<sub>6</sub> Potential/Actual Emissions Ratio <sup>(3)</sup></b>																									

<sup>(1)</sup> When potential emissions estimates are available in a disaggregated manner corresponding to the subsectors for actual emissions defined on sheet 1 of this table, these should be reported in an annex to sheet 2, using the format of sheet 1, sector F.

<sup>(2)</sup> Relevant just for Tier 1b.

<sup>(3)</sup> This ratio of potential to actual emissions applies only to emissions from the consumption of halocarbons and SF<sub>6</sub>. Emissions from metal production and from the production of halocarbons and SF<sub>6</sub> should not be included in this ratio.

**Note:** As stated in the revised UNFCCC guidelines, Parties should report actual emissions of HFCs, PFCs and SF<sub>6</sub>, where data are available, providing disaggregated data by chemical and source category in units of mass and in CO<sub>2</sub> equivalents. 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.

**TABLE 2(II). C, E SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES**  
**Metal production; Production of Halocarbons and SF<sub>6</sub>**  
 (Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA <sup>(1)</sup>		IMPLIED EMISSION FACTORS <sup>(3)</sup>	(4)
	Description <sup>(2)</sup>	(t)	(kg/t)	
<b>C. PFCs and SF<sub>6</sub> from metal production</b>				
PFC				
CF <sub>4</sub>				
C <sub>2</sub> F <sub>6</sub>				
SF <sub>6</sub>				
Aluminium foundries	<i>(SF<sub>6</sub> consumption)</i>			
Magnesium foundries				
<b>E. Production of Halocarbons and SF<sub>6</sub></b>				
<b>1. By-product emissions</b>				
Production of HCFC-22				
HFC-23				
Other				
<i>(specify chemical)</i>				
<b>2. Fugitive emissions</b>				
HFC <i>(specify chemical)</i>				
PFC <i>(specify chemical)</i>				
SF <sub>6</sub>				
<b>3. Other</b>				

<sup>(1)</sup> Where applying Tier 1b (for C), Tier 2 (for E) and country specific methods, specify any other relevant activity data used in the documentation box below.

<sup>(2)</sup> Specify the activity data used as shown in the examples within brackets.

<sup>(3)</sup> Aggregate emission factors before recovery.

<sup>(4)</sup> Enter "R" to specify cases in which the final emissions reported in the Sectoral Report table are reported after subtracting the quantities of emission recovery, oxidation, destruction, transformation. Use the documentation box for further explanations.

**Note:** Where the activity data are confidential, the entries should provide aggregate figures, but there should be a note indicating this.

**Documentation box:**

Year :

**TABLE 2(II).F SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES**  
**Consumption of Halocarbons and SF<sub>6</sub> <sup>(1)</sup>**  
**(Sheet 1 of 2)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA			IMPLIED EMISSION FACTORS			EMISSIONS		
	filled in new manufactured products (t)	Amount of fluid		Product manufacturing factor (%)	Product life factor (%)	Disposal loss factor (%)	from manufacturing (t)	from stocks (t)	from disposal (t)
		in operating systems (average annual stocks)	remained in products at decommissioning						
<b>1 Refrigeration</b>									
Air Conditioning Equipment									
Domestic refrigeration									
HFC/PPC/SF <sub>6</sub> (specify chemical) <sup>(2)</sup>									
Commercial refrigeration									
Transport refrigeration									
Industrial refrigeration									
Stationary air-conditioning									
Mobile air-conditioning									
<b>2 Foam Blowing</b>									
Hard foam									
Soft foam									
<b>3 Fire Extinguishers</b>									

<sup>(1)</sup> Indicate with a footnote or in the documentation box whether a "Bottom-up Approach" or a "Sales-Based Approach" is used.

<sup>(2)</sup> Use the rows left empty to specify the chemical consumed

Note: Where the activity data are confidential, the entries should provide aggregate figures, but there should be a note indicating this.



Year :

**TABLE 2(D).F SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES**  
**Consumption of Halocarbons and SF<sub>6</sub> <sup>(1)</sup>**  
**(Sheet 2 of 2)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA			AGGREGATE EMISSION FACTORS			EMISSIONS		
	filled in new manufactured (t)	Amount of fluid		Product manufacturing factor (%)	Product life factor (%)	Disposal loss factor (%)	from manufacturing (t)	from stocks (t)	from disposal (t)
		in operating systems (average annual stocks) (t)	remained in products at decommissioning (t)						
<b>4 Aerosols</b>									
Metered Dose Inhalers									
Other									
<b>5 Solvents</b>									
<b>6 Semiconductors</b>									
<b>7 Electric equipment</b>									
<b>8 Other (please specify)</b>									

<sup>(1)</sup> Indicate as a footnote or in the documentation box whether a "Bottom-up Approach" or a "Sales-Based Approach" is used.

<sup>(2)</sup> Use the rows left empty to specify the chemical consumed.

Note: Where the activity data are confidential, the entries should provide aggregate figures, but there should be a note indicating this.

Documentation box:

**TABLE 3 SECTORAL REPORT FOR SOLVENT AND OTHER PRODUCT USE**  
(Sheet 1 of 1)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)				
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>	N <sub>2</sub> O	NMVOC	
Total Solvent and Other Product Use				
A. Paint Application				
B. Degreasing and Dry Cleaning				
C. Chemical Products, Manufacture and Processing				
D. Other (please specify)				
<i>(Use of N<sub>2</sub>O for anaesthesia)</i>				
<i>(N<sub>2</sub>O from fire extinguishers)</i>				
<i>(N<sub>2</sub>O from aerosol cans)</i>				
<i>(Other use of N<sub>2</sub>O)</i>				

Please account for the quantity of carbon released in the form of NMVOC in both the NMVOC and the CO<sub>2</sub> columns.

Note: The IPCC Guidelines do not provide methodologies for the calculation of emissions of N<sub>2</sub>O from solvent and other product use. If you have reported such data, you should provide additional information (activity data and emission factors) used to make these estimates.

**TABLE 3.A-D SECTORAL BACKGROUND DATA FOR SOLVENT AND OTHER PRODUCT USE**  
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS	
	Description	(kt)	CO <sub>2</sub> (kg/t)	N <sub>2</sub> O (kg/t)
A. Paint Application				
B. Degreasing and Dry Cleaning				
C. Chemical Products, Manufacture and Processing				
D. Other (please specify) <sup>(1)</sup>				
<i>(Use of N<sub>2</sub>O for anesthesia)</i>				
<i>(N<sub>2</sub>O from fire extinguishers)</i>				
<i>(N<sub>2</sub>O from aerosol cans)</i>				
<i>(Other use of N<sub>2</sub>O)</i>				

<sup>(1)</sup> Some probable sources are provided in brackets. Complement the list with other relevant sources.

**Note:** The table follows the format of the IPCC Sectoral Report for Solvent and Other Product Use, although some of the source categories are not relevant to the direct GHG emissions.

**Documentation box:**

**TABLE 4 SECTORAL REPORT FOR AGRICULTURE**  
(Sheet 1 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NM/VOG	
<b>Total Agriculture</b>						
<b>A. Enteric Fermentation</b>						
1. Cattle						
2. Buffalo						
3. Sheep						
4. Goats						
5. Camels and Llamas						
6. Horses						
7. Mules and Asses						
8. Swine						
9. Poultry						
10. Other (please specify)						
<b>B. Manure Management</b>						
1. Cattle						
2. Buffalo						
3. Sheep						
4. Goats						
5. Camels and Llamas						
6. Horses						
7. Mules and Asses						
8. Swine						
9. Poultry						

**TABLE 4 SECTORAL REPORT FOR AGRICULTURE**  
(Sheet 2 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NMVOG	
<b>B. Manure Management (continued)</b>						
10. Anaerobic Lagoons						
11. Liquid Systems						
12. Solid Storage and Dry Lot						
13. Other (please specify)						
<b>C. Rice Cultivation</b>						
1. Irrigated						
2. Rainfed						
3. Deep Water						
4. Other (please specify)						
<b>D. Agricultural Soils</b>						
1. Direct Soil Emissions						
2. Animal Production						
3. Indirect Emissions						
4. Other (please specify)						
<b>E. Prescribed Burning of Savannas</b>						
<b>F. Field Burning of Agricultural Residues <sup>(1)</sup></b>						
1. Cereals						
2. Pulse						
3. Tuber and Root						
4. Sugar Cane						
5. Other (please specify)						
<b>G. Other (please specify)</b>						

**Note:** The IPCC Guidelines do not provide methodologies for the calculation of CH<sub>4</sub> emissions, CH<sub>4</sub> and N<sub>2</sub>O removals from agricultural soils, or CO<sub>2</sub> emissions from savanna burning or agricultural residues burning. If you have reported such data, you should provide additional information (activity data and emissions factors) used to make these estimates.

**TABLE 4.A SECTORAL BACKGROUND DATA FOR AGRICULTURE**

**Enteric fermentation**

(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTORS (kg CH <sub>4</sub> /head/yr)
	Population size <sup>(1)</sup> (1000 head)	Average daily feed intake (MJ/day)	CH <sub>4</sub> conversion (%)	
1. Cattle				
Dairy Cattle <sup>(2)</sup>				
Non-Dairy Cattle				
2. Buffalo				
3. Sheep				
4. Goats				
5. Camels and Llamas				
6. Horses				
7. Mules and Asses				
8. Swine				
9. Poultry				
10. Other (please specify)				

**Additional Information (for Tier 2)<sup>(a)</sup>**

Disaggregated list of animals <sup>(b)</sup>	Additional Information (for Tier 2) <sup>(a)</sup>		
	Dairy Cattle	Non-Dairy Cattle	Other
Indicators:			
Weight	(kg)		
Weight Gain	(kg/day)		
Feeding Situation	e.g stall		
Milk yield	(kg/day)		
Work	(hrs/day)		
Pregnant	(%)		
Digestibility of feed	(%)		

<sup>(a)</sup> Compare to Tables A-1 and A-2 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference manual (pp. 4.31-4.34).

<sup>(b)</sup> Disaggregate to the split actually used. Add columns to the table if necessary.

<sup>(1)</sup> Parties are encouraged to provide detailed livestock population data by animal type and region in a separate table. This consistent set of animal population statistics should be used to estimate CH<sub>4</sub> emissions from enteric fermentation, CH<sub>4</sub> and N<sub>2</sub>O from manure management, N<sub>2</sub>O direct emissions from soil and N<sub>2</sub>O emissions associated with manure production, as well as for emissions from the use of manure as fuel, and sewage-related emissions reported in the waste sector.

<sup>(2)</sup> Including dairy heifers.

**Documentation box:**

**TABLE 4.B(a) SECTORAL BACKGROUND DATA FOR AGRICULTURE**  
**CH<sub>4</sub> emissions from manure management**  
**(Sheet 1 of 1)**

Year :

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION					IMPLIED EMISSION FACTORS  CH <sub>4</sub>  (kg CH <sub>4</sub> /head/yr)		
	Population size <sup>(1)</sup> (1000 head)	Allocation by climate region <sup>(2)</sup>			Typical Animal mass (kg)		VS <sup>(3)</sup> daily excretion (kg dm/head/yr)	CH <sub>4</sub> producing potential (Bo) (CH <sub>4</sub> m <sup>3</sup> /kg VS)
		cool	temperate	warm				
1. Cattle								
Dairy Cattle <sup>(4)</sup>								
Non-Dairy Cattle								
2. Buffalo								
3. Sheep								
4. Goats								
5. Camels and Llamas								
6. Horses								
7. Mules and Asses								
8. Swine								
9. Poultry								

(1) See footnote 1, Sectoral background data table 4.A.

(2) Climate regions are defined in terms of annual average temperature as follows: Cool = less than 15°C; Temperate = 15°C to 25°C inclusive; and Warm = greater than 25°C.

(3) Volatile Solids (see page 4.23 of the Revised 1996 IPCC Guidelines, Volume 3 (Reference Manual)).

(4) Including dairy heifers.

Additional Information for Tier 2

Animal category <sup>(a)</sup>	Allocation <sup>(b)</sup> Indicator	Climate region	Animal Waste Management System						
			anaerobic lagoon	liquid system	daily spread	solid storage and dry lot	pasture range paddock	other	
Dairy Cattle	Allocation <sup>(b)</sup>	cool							
		temperate							
		warm							
Dairy Cattle	% MCP <sup>(b)</sup>	cool							
		temperate							
		warm							
Non-Dairy Cattle	Allocation <sup>(b)</sup>	cool							
		temperate							
		warm							
Non-Dairy Cattle	% MCP <sup>(b)</sup>	cool							
		temperate							
		warm							
Swine	Allocation <sup>(b)</sup>	cool							
		temperate							
		warm							
Swine	MCP <sup>(b)</sup>	cool							
		temperate							
		warm							

(a) Copy the above table as many times as necessary.

(b) Methane Conversion Factor (see page 4.9 of the Revised 1996 IPCC Guidelines, Volume 3 (Reference Manual)). In the case of use of other climate region categorization, please replace the entries in the cells with the climate regions for which the MCFs are specified.

**Documentation box:**







Year :

**TABLE 4.D SECTORAL BACKGROUND DATA FOR AGRICULTURE**  
**Agricultural soil**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS (kg N <sub>2</sub> O-N/kg N) <sup>(1)</sup>	EMISSIONS (Gg N <sub>2</sub> O) <sup>(2)</sup>
	Description	value		
<b>Direct Soil Emissions</b>				
Synthetic Fertilizers	<i>Use of synthetic fertilizers (kg N/yr)</i>			
Animal Wastes Applied to Soils	<i>Manure from dairy spread<sup>(3)</sup> (kg N/yr)</i>			
N-fixing Crops	<i>Dry pulses and soybeans produced<sup>(4)</sup> (kg dry biomass/yr)</i>			
Crop residue	<i>Dry production of other crops<sup>(4)</sup> (kg dry biomass/yr)</i>			
Cultivation of Histosols	<i>Area of cultivated organic soils (ha)</i>			
<b>Animal Production</b>	<i>N excretion on pasture range and paddock (kg N/yr)</i>			
<b>Indirect Emissions</b>				
Atmospheric Deposition	<i>Volatilized N (NH<sub>3</sub> and NOx) from fertilizers and animal wastes (kg N/yr)</i>			
Nitrogen leaching and Run-off	<i>N from fertilizers and animal wastes that is lost through leaching and run off (kg N/yr)</i>			
<b>Other (please specify)</b>				

(1) Note that the dimension of the activity data for cultivation of histosols is [kg N<sub>2</sub>O-N/ha].  
 (2) To convert from N<sub>2</sub>O-N to N<sub>2</sub>O emissions, multiply by 44/28.  
 (3) Take the value from the Sectoral background data table 4.B(b).  
 (4) Take the value from the Sectoral background data table 4.F.

**Documentation box:**

**Additional Information**

Fraction	Description	Value
Frac <sub>BURN</sub>	Fraction of crop residue burned	
Frac <sub>FUEL</sub>	Fraction of livestock N excretion in excrements burned for fuel	
Frac <sub>GASF</sub>	Fraction of synthetic fertilizer N applied to soils that volatilizes as NH <sub>3</sub> and NOx	
Frac <sub>GASM</sub>	Fraction of livestock N excretion that volatilizes as NH <sub>3</sub> and NOx	
Frac <sub>GRAZ</sub>	Fraction of livestock N excreted and deposited onto soil during grazing	
Frac <sub>LEACH</sub>	Fraction of N input to soils that is lost through leaching and runoff	
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	

(3) Use the fractions as specified on pages 4.92 - 4.113 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference manual).

Year :

**TABLE 4.E SECTORAL BACKGROUND DATA FOR AGRICULTURE**

**Prescribed burning of savanna  
(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES <i>(specify ecological zone)</i>	ACTIVITY DATA AND OTHER RELATED INFORMATION						IMPLIED EMISSION FACTORS (kg/t dm)		EMISSIONS (kg/t dm)	
	Area of Savanna Burned (k ha/yr)	Average aboveground biomass density (t dm/ha)	Fraction of savanna burned	Biomass burned (Gg dm)	Nitrogen fraction in biomass					
						CH <sub>4</sub>	N <sub>2</sub> O	CH <sub>4</sub>	N <sub>2</sub> O	

**Additional Information**

	<i>Living</i>	<i>Dead</i>
Fraction of aboveground biomass		
Fraction oxidized		
Carbon fraction		

**Documentation box:**

**TABLE 4.F SECTORAL BACKGROUND DATA FOR AGRICULTURE**  
**Field burning of agricultural residue**  
**(Sheet 1 of 1)**

Year :

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION						IMPLIED EMISSION FACTORS		EMISSIONS	
	Crop production (t)	Residue/ Crop ratio	Dry matter fraction	Fraction burned	Nitrogen fraction in biomass	CH <sub>4</sub> (kg/t dm)	N <sub>2</sub> O (kg/t dm)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)	
<b>1. Cereals</b>										
Wheat										
Barley										
Maize										
Oats										
Rye										
Rice										
Other (please specify)										
<b>2. Pulse <sup>(1)</sup></b>										
Dry bean										
Peas										
Soybeans										
Other (please specify)										
<b>3 Tuber and Root</b>										
Potatoes										
Other (please specify)										
<b>4 Sugar Cane</b>										
<b>5 Other (please specify)</b>										

<sup>(1)</sup> To be used in Sectoral Background Data Table 4 D: Agricultural Soil.

Documentation box:

**TABLE 5 SECTORAL REPORT FOR LAND-USE CHANGE AND FORESTRY**  
(Sheet 1 of 1)

Year :

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> Emissions	CO <sub>2</sub> Removals	Net CO <sub>2</sub> Emissions/ Removals	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO
<b>Total Land-Use Change and Forestry</b>							
<b>A. Changes in Forest and Other Woody Biomass Stocks</b>							
1. Tropical Forests							
2. Temperate Forests							
3. Boreal Forests							
4. Grasslands/Tundra							
5. Other (please specify)							
Harvested Wood <sup>(1)</sup>							
<b>B. Forest and Grassland Conversion <sup>(2)</sup></b>							
1. Tropical Forests							
2. Temperate Forests							
3. Boreal Forests							
4. Grasslands/Tundra							
5. Other (please specify)							
<b>C. Abandonment of Managed Lands</b>							
1. Tropical Forests							
2. Temperate Forests							
3. Boreal Forests							
4. Grasslands/Tundra							
5. Other (please specify)							
<b>D. CO<sub>2</sub> Emissions and Removals from Soil</b>							
Cultivation of Mineral Soils							
Cultivation of Organic Soils							
Liming of Agricultural Soils							
Forest Soils							
Other (please specify) <sup>(3)</sup>							
<b>E. Other (please specify)</b>							

<sup>(1)</sup> Following the IPCC Guidelines, the harvested wood should be reported under Changes in Forest and Other Woody Biomass Stocks (see page 5.17 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference Manual)).

<sup>(2)</sup> Include only the emissions of CO<sub>2</sub> from Forest and Grassland Conversion. Associated removals should be reported under section D.

<sup>(3)</sup> Include emissions from soils not reported under sections A, B and C.

**Note:** This table should be used by all Parties. Sectoral Background Data Tables on Land-use Change and Forestry should be filled in only by Parties using the IPCC default methodology. Parties that use country specific methods and models should report information on them in a transparent manner, also providing suggestions for a possible Background Table suitable for their calculation method.

**TABLE 5.A SECTORAL BACKGROUND DATA TABLE FOR LAND-USE CHANGE AND FORESTRY** Year:

**Changes in forest and other woody biomass stocks**  
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES			ACTIVITY DATA		EMISSION FACTORS	ESTIMATES
			Area of Forest/Biomass Stocks (kha)	Average Annual Growth Rate (t dm/ha)	Implied Carbon Uptake Factor (t C/ha)	Carbon Uptake Increment (Gg C)
Tropical	Plantations	<i>Acacia spp.</i>				
		<i>Eucalyptus spp.</i>				
		<i>Tectona grandis</i>				
		<i>Pinus spp</i>				
		<i>Pinus caribaea</i>				
		Mixed Hardwoods				
		Mixed Fast-Growing Hardwoods				
		Mixed Softwoods				
	Other Forests	Moist				
		Seasonal				
		Dry				
	Other (specify)					
Temperate	Plantations					
	Commercial	Evergreen				
		Deciduous				
	Other					
Boreal						
Non-Forest Trees (specify type)			Number of trees (1000s of trees)	Annual Growth Rate (kt dm/1000 trees)	Carbon Uptake Factor (t C/tree)	Carbon Uptake (Gg C)
Total Annual Growth Increment						
Gg CO <sub>2</sub>						
			Amount of Biomass Removed (kt dm)	Carbon Emission Factor (t C/t dm)	Carbon Release (Gg C)	
Total biomass removed in Commercial Harvest						
Traditional Fuelwood Consumed						
Total Other Wood Use						
Total Biomass Consumption from Stocks <sup>(1)</sup>						
Annual Fellings (incl. Harvest)						
Other Changes in Carbon Stocks						
Gg CO <sub>2</sub>						
Net Annual Carbon Uptake (+) or Release (-) (Gg C)						
Net Annual CO <sub>2</sub> Emissions (+) or Removals (-) (Gg CO <sub>2</sub> )						

<sup>(1)</sup> Make sure that the quantity of biomass burned off-site is subtracted from this total.

**Documentation box:**

**TABLE 5.B SECTORAL BACKGROUND DATA TABLE FOR LAND-USE CHANGE AND FORESTRY**  
**Forest and grassland conversion**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION					IMPLIED EMISSION FACTORS				EMISSIONS			
	Area Converted Annually (kha)	On and off site burning		Average Area Converted (kha)	Average Annual Net Loss of Biomass (t dm/ha)	Average Quantity of Biomass Left to Decay (kt dm)	Burning		Decay	Burning		Decay	
		Annual Net Loss of Biomass (kt dm)	on Site (kt dm)				off Site (kt dm)	on site		off site	on site		off site
Vegetation types	(kha)	(kt dm)	(kt dm)	(kha)	(t dm/ha)	(kt dm)	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	
Tropical													
Wet/Very Moist													
Moist, short dry season													
Moist, long dry season													
Dry													
Montane Moist													
Montane Dry													
Tropical Savanna/Grasslands													
Temperate													
Coniferous													
Broadleaf													
Mixed Broadleaf/													
Coniferous													
Grasslands													
Boreal													
Mixed Broadleaf/													
Coniferous													
Coniferous													
Forest													
Grasslands/Tundra													
Other													

<sup>(1)</sup> Activity data are for default 10-year average. Specify the average decay time which is appropriate for the local conditions, if other than 10 years.

**Additional Information**

Emissions/Removals (Gg)	Fractions	
	on site	off site
Immediate Carbon Release from Burning		
<i>total</i>		
Delayed Emissions from Decay		
Total Annual Carbon Release		
CO <sub>2</sub> emissions		

**Documentation box:**

--

**TABLE 5.C SECTORAL BACKGROUND DATA TABLE FOR LAND-USE CHANGE AND FORESTRY**  
**Abandonment of managed lands**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION						IED EMISSION FAC		ESTIMATES	
	Total Area Abandoned and Regrowing <sup>(1)</sup>		Annual Rate of Aboveground Biomass Growth		Carbon Fraction of Aboveground Biomass		Rate of Aboveground Biomass Carbon Uptake (t C/ha/yr)	Annual Carbon Uptake in Aboveground Biomass (Gg C/yr)	Annual Carbon Uptake in Aboveground Biomass (Gg C/yr)	
	first 20 years (kha)	>20 years (kha)	first 20 years (t dm/ha)	>20 years (t dm/ha)	first 20 years	>20 years				
Original natural ecosystems										
Tropical										
	Wet/Very Moist									
	Moist, short dry season									
	Moist, long dry season									
	Dry									
	Montane Moist									
	Montane Dry									
Tropical Savanna/Grasslands										
Temperate										
	Mixed									
	Broadleaf/Coniferous									
	Coniferous									
	Broadleaf									
Grasslands										
Boreal										
	Mixed									
	Broadleaf/Coniferous									
	Coniferous									
	Forest									
Grasslands/Tundra										
Other										
							Total Annual Carbon Uptake (Gg)			
							CO <sub>2</sub> removal (Gg)			

<sup>(1)</sup> If lands are regenerating to grassland, then the default assumption is that no significant changes in above-ground biomass occur.

Documentation box:



Year :

**TABLE 5.D SECTORAL BACKGROUND DATA TABLE FOR LAND-USE CHANGE AND FORESTRY  
CO<sub>2</sub> emissions and removals from soil**  
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS		ESTIMATES		Additional Information									
	Land Area (year t) (Mha)	Land Area (year t-20) (Mha)	Soil carbon content (t) (Mg C/ha)	Soil carbon content (t-20) (Mg C/ha)	Net change in soil carbon in mineral soils	Net change in Mineral Soils (Tg C over 20 yr)	Climate (a)	land-use/ management system	High activity soils	Low activity soils	activity soils	Sandy soils	Volcanic	Wetland (Aquic)	Organic soil	
<b>Cultivation of mineral soils</b>																
High activity soils																
Low activity soils																
Sandy																
Volcanic																
Wetland (Aquic)																
Other (specify)																
Total <sup>(2)</sup>																
	Land Area (ha)		Annual Loss Rate (Mg C/ha/yr)		Carbon Emissions from Organic Soils (Mg/yr)											
<b>Cultivation of Organic Soils</b>					Net carbon loss from organic soils											
<i>Cool temperate</i>																
Upland crops																
Pasture/Forest																
<i>Warm temperate</i>																
Upland crops																
Pasture/Forest																
<i>Tropical</i>																
Upland crops																
Pasture/Forest																
Total Annual Amount of Lime (Mg)			Carbon Conversion Factor		Carbon Emissions from Liming (Mg C)											
<b>Liming of agricultural soils</b>					Total carbon emissions from liming											
Limestone Ca(CO <sub>3</sub> )																
Dolomite CaMg(CO <sub>3</sub> ) <sub>2</sub>																
Total annual net carbon emissions from agriculturally impacted soils (Gg)																
Total annual net CO <sub>2</sub> emissions from agriculturally impacted soils (Gg)																

<sup>(a)</sup> See Table 5-9 (page 5.26) of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 (Workbook)

<sup>(1)</sup> Ratio of soils under native vegetation to agriculturally impacted soils.  
<sup>(2)</sup> Make sure that the land areas in the activity data columns are equal.

**Documentation box:**

**TABLE 6 SECTORAL REPORT FOR WASTE**  
(Sheet 1 of 1)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES							
(Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub> <sup>(1)</sup>	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
<b>Total Waste</b>							
<b>A. Solid Waste Disposal on Land</b>							
1. Managed Waste Disposal on Land							
2. Unmanaged Waste Disposal Sites							
3. Other (please specify)							
<b>B. Wastewater Handling</b>							
1. Industrial Wastewater							
2. Domestic and Commercial Waste-water							
3. Other (please specify)							
<b>C. Waste Incineration</b>							
<b>D. Other (please specify)</b>							

<sup>(1)</sup> Note that CO<sub>2</sub> from waste incineration should only be included if it stems from non-biological or inorganic waste sources.

Year :

**TABLE 6.A SECTORAL BACKGROUND DATA FOR WASTE**  
**Solid waste disposal**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTOR		EMISSIONS	
	Annual MSW at the SWDS (t)	MCF degraded (t)	CH <sub>4</sub> <sup>(1)</sup> (t/t MSW)	CO <sub>2</sub> (t/t MSW)	CH <sub>4</sub> <sup>(1)</sup> (Gg)	CO <sub>2</sub> (Gg)
1 Managed Waste Disposal on Land						
2 Unmanaged Waste Disposal Sites						
- deep (>5 m)						
- shallow (<5 m)						
3 Other (please specify (e.g. industrial wastes))						

**TABLE 6.C SECTORAL BACKGROUND DATA FOR WASTE**  
**Waste incineration**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA Amount of incinerated wastes (t)	IMPLIED EMISSION FACTOR					EMISSIONS		
		CO <sub>2</sub> <sup>(3)</sup> (g / t waste)	CO <sub>2</sub> <sup>(4)</sup> (g / t waste)	CH <sub>4</sub> (g / t waste)	N <sub>2</sub> O (g / t waste)	CO <sub>2</sub> <sup>(3)</sup> (Gg)	CO <sub>2</sub> <sup>(4)</sup> (Gg)	CH <sub>4</sub> (Gg)	N <sub>2</sub> O (Gg)
Incinerated wastes (please specify (biogenic) <sup>(2)</sup> (plastics) <sup>(3)</sup> )									

MSW - Municipal Solid Waste, SWDS - Solid Waste Disposal Site, MCF - Methane Correction Factor, DOC - Degradable Organic Carbon (see section 6.2.4. of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference Manual). MSW includes household waste, yard/garden waste, commercial/market waste, significant quantity of organic industrial solid waste (without industrial and construction waste).

(1) Before recovery.  
 (2) CO<sub>2</sub> emissions from biogenic wastes are not included in the totals.  
 (3) CO<sub>2</sub> emissions from non-biogenic wastes are included in the totals.

**Documentation box:** Parties that use country specific models should note this with a brief rationale in the documentation box and fill the relevant cells only.

**Additional Information**

Total population (1000 inhabitants <sup>(a)</sup> ):	
Urban population (1000 persons)	
Waste generation rate (kg/capita/day):	
Fraction of MSW disposed to SWDS (%):	
Fraction of DOC in MSW:	
Fraction of wastes incinerated:	
Fraction of wastes recycled:	
CH <sub>4</sub> oxidation factor <sup>(b)</sup> :	
CH <sub>4</sub> fraction in landfill gas:	
Number of SWDS recovering CH <sub>4</sub> :	
CH <sub>4</sub> recovered and flared or utilized(Gg/yr):	
CH <sub>4</sub> generation rate constant (k): <sup>(b)</sup>	
Time lag considered (yr): <sup>(b)</sup>	
Composition of landfilled waste (%):	
Paper and paperboard	
Food and garden waste	
Plastics	
Glass	
Textiles	
Other (specify)	
other - inert	
other - organic	

(a) Specify whether total or urban population is used and the rationale for doing so.

(b) See page 6.9 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference Manual).

(c) For Parties using Tier 2 methods.

**TABLE 6.B SECTORAL BACKGROUND DATA FOR WASTE**  
**Wastewater handling**  
**(Sheet 1 of 1)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA <sup>(1)</sup>			IMPLIED EMISSION FACTOR			EMISSIONS		
	Total organic product Wastewater (kg DC <sup>(1)</sup> /yr)	Sludge	CH <sub>4</sub> recovered and/or flared (Gg)	CH <sub>4</sub> <sup>(2)</sup>		N <sub>2</sub> O (kg/kg DC)	CH <sub>4</sub> <sup>(2)</sup>		N <sub>2</sub> O (Gg)
				Wastewater (kg/kg DC)	Sludge (kg/kg DC)		Wastewater (Gg)	Sludge (Gg)	
Industrial Wastewater									
Domestic and Commercial Wastewater									
Other (please specify)									

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTOR		EMISSIONS	
	Protein consumption (protein in kg/person/yr)	N fraction (kg N/kg protein)	N <sub>2</sub> O (kg N <sub>2</sub> O-N/kg sewage N produced)	N <sub>2</sub> O (Gg)	N <sub>2</sub> O (Gg)	N <sub>2</sub> O (Gg)
<b>N<sub>2</sub>O from human sewage</b>						

<sup>(1)</sup> DC - degradable organic component. DC indicators are COD (Chemical Oxygen Demand) for industrial wastewater and BOD (Biochemical Oxygen Demand) for Domestic/Commercial wastewater/sludge. See pages 6.14, 6.18 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference Manual).

<sup>(2)</sup> Before recovery.

Documentation box:

Additional Information

Total wastewater (m<sup>3</sup>):

Treated wastewater (%):

Year :

Waste-water streams:	Wastewater output (m <sup>3</sup> )	DC (kgCOD/m <sup>3</sup> )
<b>Industrial wastewater</b>		
iron and steel		
non-ferrous		
fertilizers		
food and beverage		
paper and pulp		
organic chemicals		
other		
	DC (kg BOD/1000 person/yr)	
<b>Domestic</b>		
<b>Other</b>		

Handling systems:	Industrial waste-water treated (%)	Ind sludge treated (%)	Domestic waste-water treated (%)	Domestic sludge treated (%)
aerobic				
anaerobic				
other (specify)				

<sup>(3)</sup> Specify whether total or urban population is used in the calculations and the rationale for doing so. Provide both figures.

**TABLE 7 OVERVIEW TABLE FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 8A)**  
(Sheet 1 of 3)

OVERVIEW TABLE																					
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		HFCs		PFCs		SF <sub>6</sub>		NO <sub>x</sub>		CO		NMVOC		SO <sub>2</sub>		
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	
<b>Total National Emissions and Removals</b>																					
<b>1 Energy</b>																					
A Fuel Combustion Activities																					
Reference Approach																					
Sectoral Approach																					
1. Energy Industries																					
2. Manufacturing Industries and Construction																					
3. Transport																					
4. Other Sectors																					
5. Other (please specify)																					
B. Fugitive Emissions from Fuels																					
1. Solid Fuels																					
2. Oil and Natural Gas																					
<b>2 Industrial Processes</b>																					
A Mineral Products																					
B. Chemical Industry																					
C. Metal Production																					
D Other Production																					
E. Production of Halocarbons and Sulphur Hexafluoride																					

Note: To fill in the table use the notation key as given on page Tables.37 of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1.

**TABLE 7 OVERVIEW TABLE FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 8A)**  
(Sheet 2 of 3)

OVERVIEW TABLE																					
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		HFCS		PFCs		SF <sub>6</sub>		NO <sub>x</sub>		CO		NMVOC		SO <sub>2</sub>		
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	
<b>2 Industrial Processes (continued)</b>																					
F. Consumption of Halocarbons and Sulphur Hexafluoride																					
Potential <sup>(1)</sup>																					
Actual <sup>(2)</sup>																					
G Other (please specify)																					
<b>3 Solvent and Other Product Use</b>																					
<b>4 Agriculture</b>																					
A Enteric Fermentation																					
B Manure Management																					
C Rice Cultivation																					
D Agricultural Soils																					
E. Prescribed Burning of Savannas																					
F. Field Burning of Agricultural Residues																					
G Other (please specify)																					
<b>5 Land-Use Change and Forestry</b>																					
A Changes in Forest and Other Woody Biomass Stocks																					
B Forest and Grassland Conversion																					

<sup>(1)</sup> Potential emissions based on Tier 1 Approach.

<sup>(2)</sup> Actual emissions based on Tier 2 Approach.

**TABLE 7 OVERVIEW TABLE FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 8A)**  
**(Sheet 3 of 3)**

OVERVIEW TABLE																					
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		HFCs		PFCs		SF <sub>6</sub>		NO <sub>x</sub>		CO		NMVOC		SO <sub>2</sub>		
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	
<b>5 Land-Use Change and Forestry (continued)</b>																					
C. Abandonment of Managed Lands																					
D. CO <sub>2</sub> Emissions and Removals from Soil																					
E. Other (please specify)																					
<b>6 Waste</b>																					
A. Solid Waste Disposal on Land																					
B. Wastewater Handling																					
C. Waste Incineration																					
D. Other (please specify)																					
<b>7 Other (please specify)</b>																					
Memo Items:																					
International Bankers																					
Aviation																					
Marine																					
Multilateral Operations																					
CO <sub>2</sub> Emissions from Biomass																					

**TABLE 8(a) RECALCULATION**  
**Recalculated year:**  
**(Sheet 1 of 2)**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O	
	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)
	difference <sup>(1)</sup> (%)	difference <sup>(1)</sup> (%)	difference <sup>(1)</sup> (%)	difference <sup>(1)</sup> (%)	difference <sup>(1)</sup> (%)	difference <sup>(1)</sup> (%)
<b>1. Energy</b>						
<b>1.A. Fuel Combustion Activities</b>						
1.A.1. Energy Industries						
1.A.2. Manufacturing Industries and Construction						
1.A.3. Transport						
1.A.4. Other Sectors						
1.A.5. Other						
1.B. Fugitive Emissions from Fuels						
1.B.1. Solid fuel						
1.B.2. Oil and Natural Gas						
<b>2. Industrial Processes</b>						
2.A. Mineral Products						
2.B. Chemical Industry						
2.C. Metal Production						
2.D. Other Production						
2.G. Other						
<b>3. Solvent and Other Product Use</b>						
<b>4. Agriculture</b>						
4.A. Enteric Fermentation						
4.B. Manure Management						
4.C. Rice Cultivation						
4.D. Agricultural Soils						
4.E. Prescribed Burning of Savannas						
4.F. Field Burning of Agricultural Residues						
4.G. Other						
<b>5. Land-Use Change and Forestry (net)</b>						
5.A. Changes in Forest and Other Woody Biomass Stocks						
5.B. Forest and Grassland Conversion						
5.C. Abandonment of Managed Lands						
5.D. CO <sub>2</sub> Emissions and Removals from Soil						
5.E. Other						

<sup>(1)</sup> Estimate the change due to recalculation with respect to the previous submission (previous submission = 100%). All cases of recalculation of the estimate of the source/sink category, should be addressed and explained in Table 8(b).



**TABLE 8(a) RECALCULATION**  
 Recalculated year:  
 (Sheet 2 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		difference <sup>(1)</sup> (%)
	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)	previous submission (Gg CO <sub>2</sub> eq.)	latest submission (Gg CO <sub>2</sub> eq.)	
<b>6. Waste</b>							
6.A: Solid Waste Disposal on Land							
6.B: Wastewater Handling							
6.C: Waste Incineration							
6.D: Other							
<b>7. Other</b>							
<b>TOTALS</b>							
<b>Memo Items</b>							
<b>International Bunkers</b>							
<b>Multilateral Operations</b>							
<b>CO<sub>2</sub> Emissions from Biomass</b>							
<b>Actual emissions of</b>							
<b>HFCs</b>							
<b>PFCs</b>							
<b>SF<sub>6</sub></b>							
2.C: Aluminium production							
2.E: Production of HFC/PFC and SF <sub>6</sub>							
2.F: Consumption of HFC/PFC and SF <sub>6</sub>							
<b>Total actual emissions</b>							
<b>OVERALL CO<sub>2</sub> EQUIVALENT EMISSIONS</b>							
<b>Previous submission</b>							
<b>Latest submission</b>							
<b>change</b>							

<sup>(1)</sup> Estimate the change due to recalculation with respect to the previous submission (previous submission = 100%). All cases of recalculation of the estimate of the source/sink category, should be addressed and explained in Table 8(b).



**TABLE 9 COMPLETENESS**  
(Sheet 1 of 2)

Sources and sinks not reported (NE) <sup>(1)</sup>			
GHG	Sector <sup>(2)</sup>	Source/sink category <sup>(2)</sup>	Explanation
CO <sub>2</sub>			
CH <sub>4</sub>			
N <sub>2</sub> O			
HFCs			
PFCs			
SF <sub>6</sub>			
Sources and sinks reported elsewhere (IE) <sup>(3)</sup>			
GHG	Source/sink category	Allocation as per IPCC Guidelines	Allocation used by the Party
			Explanation

<sup>(1)</sup> Please, clearly indicate sources and sinks which are considered in the IPCC Guidelines but are not considered in the submitted inventory. Explain the reason for excluding these sources and sinks, in order to avoid arbitrary interpretations. An entry should be made for each source/sink category for which the indicator "NE" is entered in the sectoral tables.

<sup>(2)</sup> Indicate omitted source/sink following the IPCC source/sink category structure (e.g. sector: waste, source: wastewater handling).

<sup>(3)</sup> Please clearly indicate sources and sinks in the submitted inventory that are allocated to a sector other than that indicated by the IPCC Guidelines. Show the sector indicated in the IPCC Guidelines and the sector to which the source or sink is allocated in the submitted inventory. Explain the reason for reporting these sources and sinks in a different sector. An entry should be made for each source/sink for which the indicator "IE" is used in the sectoral tables.

**TABLE 9 COMPLETENESS**  
(Sheet 2 of 2)

Additional GHG emissions reported <sup>(1)</sup>					
GHG	Source category	Emissions (Gg)	Estimated GWP (100-year horizon)	Emissions (Gg CO <sub>2</sub> eq.)	Explanation <sup>(2)</sup>

<sup>(1)</sup> Parties are encouraged to provide information on emissions of greenhouse gases whose GWP values have not yet been agreed upon by the COP. Please include such gases in this table if they are considered in the submitted inventory.

<sup>(2)</sup> Please provide additional information on the estimation methods used and reference to the data source of GWP value.

**TABLE 10 EMISSIONS TRENDS (CO<sub>2</sub>)**  
(Sheet 1 of 5)

Year:

GHG Source and Sink Categories CO <sub>2</sub> equivalent emissions (Gg)	Emissions (Gg)									
	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>1. Energy</b>										
A. Fuel Combustion (Sectoral Approach)										
1. Energy Industries										
2. Manufacturing Industries and Construction										
3. Transport										
4. Other Sectors										
5. Other										
B. Fugitive Emissions from Fuels										
1. Solid Fuels										
2. Oil and Natural Gas										
<b>2. Industrial Processes</b>										
A. Mineral Products										
B. Chemical Industry										
C. Metal Production										
D. Other Production										
E. Production of Halocarbons and SF <sub>6</sub>										
F. Consumption of Halocarbons and SF <sub>6</sub>										
G. Other										
<b>3. Solvent and Other Product Use</b>										
<b>4. Agriculture</b>										
A. Enteric Fermentation										
B. Manure Management										
C. Rice Cultivation										
D. Agricultural Soils										
E. Prescribed Burning of Savannas										
F. Field Burning of Agricultural Residues										
G. Other										
<b>5. Land-Use Change and Forestry<sup>(2)</sup></b>										
A. Changes in Forest and Other Woody Biomass Stocks										
B. Forest and Grassland Conversion										
C. Abandonment of Managed Lands										
D. CO <sub>2</sub> Emissions and Removals from Soil										
E. Other (please specify)										
<b>6. Waste</b>										
A. Solid Waste Disposal on Land										
B. Waste-water Handling										
C. Waste Incineration										
D. Other										
<b>7. Other (please specify)</b>										
<b>Total Emissions/Removals<sup>(3)</sup></b>										
<b>Total (without LUCF)<sup>(3)</sup></b>										
<b>Memo Items:</b>										
<b>International Bunkers</b>										
Aviation										
Marine										
<b>Multilateral Operations</b>										
<b>CO<sub>2</sub> Emissions from Biomass</b>										

<sup>(1)</sup> Specify the base year adopted by the Party under the Convention.

<sup>(2)</sup> Take the net emissions as reported in Table 1A. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

<sup>(3)</sup> The information in these rows is requested to facilitate comparison of data, since Parties differ in the way they report CO<sub>2</sub> emissions and removals from Land-Use Change and Forestry.

**TABLE 10 EMISSIONS TRENDS (CH<sub>4</sub>)**  
(Sheet 2 of 5)

Year:

GHG Source and Sink Categories	Emissions (Gg)									
	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Total Emissions</b>										
<b>1. Energy</b>										
A. Fuel Combustion (Sectoral Approach)										
1. Energy Industries										
2. Manufacturing Industries and Construction										
3. Transport										
4. Other Sectors										
5. Other										
B. Fugitive Emissions from Fuels										
1. Solid Fuels										
2. Oil and Natural Gas										
<b>2. Industrial Processes</b>										
A. Mineral Products										
B. Chemical Industry										
C. Metal Production										
D. Other Production										
E. Production of Halocarbons and SF <sub>6</sub>										
F. Consumption of Halocarbons and SF <sub>6</sub>										
G. Other										
<b>3. Solvent and Other Product Use</b>										
<b>4. Agriculture</b>										
A. Enteric Fermentation										
B. Manure Management										
C. Rice Cultivation										
D. Agricultural Soils										
E. Prescribed Burning of Savannas										
F. Field Burning of Agricultural Residues										
G. Other										
<b>5. Land-Use Change and Forestry</b>										
A. Changes in Forest and Other Woody Biomass Stocks										
B. Forest and Grassland Conversion										
C. Abandonment of Managed Lands										
D. CO <sub>2</sub> Emissions and Removals from Soil										
E. Other (please specify)										
<b>6. Waste</b>										
A. Solid Waste Disposal on Land										
B. Waste-water Handling										
C. Waste Incineration										
D. Other										
<b>7. Other (please specify)</b>										
<b>Memo Items:</b>										
<b>International Bunkers</b>										
Aviation										
Marine										
<b>Multilateral Operations</b>										
<b>CO<sub>2</sub> Emissions from Biomass</b>										

<sup>(1)</sup> Fill in the base year adopted by the Party under the Convention, if different from 1990

**TABLE 10 EMISSIONS TRENDS (N<sub>2</sub>O)**  
**(Sheet 3 of 5)**

Year:

GHG Source and Sink Categories	Emissions (Gg)									
	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Total Emissions</b>										
<b>1. Energy</b>										
A. Fuel Combustion (Sectoral Approach)										
1. Energy Industries										
2. Manufacturing Industries and Construction										
3. Transport										
4. Other Sectors										
5. Other										
B. Fugitive Emissions from Fuels										
1. Solid Fuels										
2. Oil and Natural Gas										
<b>2. Industrial Processes</b>										
A. Mineral Products										
B. Chemical Industry										
C. Metal Production										
D. Other Production										
E. Production of Halocarbons and SF <sub>6</sub>										
F. Consumption of Halocarbons and SF <sub>6</sub>										
G. Other										
<b>3. Solvent and Other Product Use</b>										
<b>4. Agriculture</b>										
A. Enteric Fermentation										
B. Manure Management										
C. Rice Cultivation										
D. Agricultural Soils										
E. Prescribed Burning of Savannas										
F. Field Burning of Agricultural Residues										
G. Other										
<b>5. Land-Use Change and Forestry</b>										
A. Changes in Forest and Other Woody Biomass Stocks										
B. Forest and Grassland Conversion										
C. Abandonment of Managed Lands										
D. CO <sub>2</sub> Emissions and Removals from Soil										
E. Other (please specify)										
<b>6. Waste</b>										
A. Solid Waste Disposal on Land										
B. Waste-water Handling										
C. Waste Incineration										
D. Other										
<b>7. Other (please specify)</b>										
<b>Memo Items:</b>										
<b>International Bunkers</b>										
Aviation										
Marine										
<b>Multilateral Operations</b>										
<b>CO<sub>2</sub> Emissions from Biomass</b>										

<sup>(1)</sup> Fill in the base year adopted by the Party under the Convention, if different from 1990

**TABLE 10 EMISSION TRENDS (HFC, PFC and SF<sub>6</sub>)**

Year:

(Sheet 4 of 5)

GHG Source and Sink Categories	Emissions (Gg)									
	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Emissions of HFCs<sup>(2)</sup></b>										
HFC-23										
HFC-32										
HFC-41										
HFC-43-10mee										
HFC-125										
HFC-134										
HFC-134a										
HFC-152a										
HFC-143										
HFC-143a										
HFC-227ea										
HFC-236fa										
HFC-245ca										
<b>Emissions of PFCs<sup>(2)</sup></b>										
CF <sub>4</sub>										
C <sub>2</sub> F <sub>6</sub>										
C <sub>3</sub> F <sub>8</sub>										
C <sub>4</sub> F <sub>10</sub>										
c-C <sub>4</sub> F <sub>8</sub>										
C <sub>5</sub> F <sub>12</sub>										
C <sub>6</sub> F <sub>14</sub>										
<b>Emissions of SF<sub>6</sub><sup>(2)</sup></b>										

<sup>(1)</sup> Fill in the base year adopted by the Party under the Convention, if different from 1990.

<sup>(2)</sup> Enter information on the actual emissions. Where estimates are only available for the potential emissions, specify this in a footnote.



**TABLE 10 EMISSION TRENDS (SUMMARY)**

Year:

(Sheet 5 of 5)

GHG emissions	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>CO<sub>2</sub> equivalent emissions (Gg)</b>										
Net CO <sub>2</sub> emissions/removals										
CO <sub>2</sub> emissions (without LUCF) <sup>(2)</sup>										
CH <sub>4</sub>										
N <sub>2</sub> O										
HFC										
PFC										
SF <sub>6</sub>										
Total (with net CO <sub>2</sub> emissions/removals)										
Total (without CO <sub>2</sub> from LUCF) <sup>(2)</sup>										

GHG emission sources/sinks	Base year <sup>(1)</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Emissions (Gg CO<sub>2</sub> equivalent)</b>										
1. Energy										
2. Industrial Processes										
3. Solvent and Other Product Use										
4. Agriculture										
5. Land-Use Change and Forestry <sup>(3)</sup>										
6. Waste										
7. Other										

<sup>(1)</sup> Fill in the base year adopted by the Party under the Convention, if different from 1990.

<sup>(2)</sup> The information in these rows is requested to facilitate comparison of data, since Parties differ in the way they report CO<sub>2</sub> emissions and removals from Land-Use Change and Forestry.

<sup>(3)</sup> Net emissions.

**TABLE 11 CHECK LIST of REPORTED INVENTORY INFORMATION<sup>(1)</sup>**

**Party:** \_\_\_\_\_ **Year:** \_\_\_\_\_

Contact info:	Focal point for national GHG inventories:			
	Address:			
	Telephone:	Fax:	E-mail:	
	Main institution preparing the inventory			

General info:	Date of submission:			
	Base years:	PFCs, HFCs, SF <sub>6</sub>		
	Year(s) covered in the submission:			
	Gases covered:			
Omissions in geographic coverage:				

Tables:		energy	ind.processes	solvent use	LUCF	agriculture	waste
	IPCC Sectoral report tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Background data tables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	IPCC Summary tables	IPCC Table 7A <input type="checkbox"/>		IPCC Table 7B <input type="checkbox"/>			
	CO <sub>2</sub> equivalent table	<input type="checkbox"/>					
	Uncertainty	IPCC Table 8A <input type="checkbox"/>	National information <input type="checkbox"/>				<input type="checkbox"/>
	Recalculation table	<input type="checkbox"/>					
Completeness table	<input type="checkbox"/>						

CO <sub>2</sub>	Comparison of	Worksheet 1-1	Percentage of difference	Explanation of differences
	CO <sub>2</sub> from fuel combustion	<input type="checkbox"/>		<input type="checkbox"/>

Recalculation:		energy	ind.processes	solvent use	LUCF	agriculture	waste
	CO <sub>2</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CH <sub>4</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	N <sub>2</sub> O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HFC,PFC,SF <sub>6</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Explanations:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CRF tables for sectors with changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Summary tables for all recalculated years	<input type="checkbox"/>						
Full CRF for the recalculated base year	<input type="checkbox"/>						

HFC, PFC, SF <sub>6</sub>		HFC		PFC		SF <sub>6</sub>	
	Disaggregation by species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Production of Halocarbons/SF <sub>6</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Consumption of Halocarbons/SF <sub>6</sub>	Actual <input type="checkbox"/>	Potential <input type="checkbox"/>	Actual <input type="checkbox"/>	Potential <input type="checkbox"/>	Actual <input type="checkbox"/>	Potential <input type="checkbox"/>
Potential/Actual emission ratio							

Reference to the National Inventory Report and/or national inventory \_\_\_\_\_

CRF - Common Reporting Format.  
LUCF - Land-Use Change and Forestry.

<sup>(1)</sup> For each omission, give an explanation for the reasons on a separate page attached to the check-list.