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## 2 REPORTING THE NATIONAL INVENTORY

*This chapter contains step by step instructions for reporting a national greenhouse gas inventory.*

### How To Report Your Inventory

At the end of these reporting instructions you should have

- filled in the Sectoral Report Tables
- filled in the Summary Report and Overview Tables
- prepared an Inventory Report which contains the required numerical and text documentation (see step 5)

Do Step 1 if you have an existing inventory and would like to report it to the IPCC. If you are working from a completed CORINAIR inventory (see Annex 2). If you are using the *Workbook* methods and you now want to report your inventory, go directly to Step 2 to begin to fill out the Sectoral Report Tables.

Remember that the *Reference Manual (Volume 3)* contains background information and full explanations of the methodologies referred to here.

#### STEP 1 REVIEW THE IPCC COMMON REPORTING FRAMEWORK

### Inventory Scope

You are requested to provide a complete inventory for 1990. This should include all anthropogenic emissions by source and removals by sink of greenhouse gases and ozone precursors, except those covered by the Montreal Protocol.

You have the option to add other greenhouse gases or precursors to your inventory report. If you add other gases you should use the IPCC source category structure as far as possible. If you add or change the definitions of any categories to report these additional gases, you should clearly explain these changes. Use the spare copies of Tables 7A & 7B with blank column headings to report these emissions. Countries that wish to report Montreal Protocol substances for completeness may do so using this procedure.

### Standard Units (pollutants, activity data and emission factors)

All estimates should be reported in gigagrams (Gg) of the pollutant. Preferred units for activity data, emission factors and other data are indicated in each of the worksheets of the *Workbook (Volume 2)*.

### Source/Sink Categories

Your emissions inventories should use the IPCC source/sink categories as far as possible. The structure for reporting inventory information is summarised in the preceding chapter and in the Tables in this book.

Compare the IPCC source/sink categories (Chapter 1: Understanding the Common Reporting Framework) with the categories already used in your national inventory. Where there are differences it may be possible to allocate a larger category among appropriate smaller IPCC categories. Alternatively, if there is no way to allocate the category, you could report several of your smaller categories at a higher level of aggregation in the IPCC structure. .

If your inventory cannot be re-structured to fit the IPCC model, or if you must show estimates under an "other" category, you should:

- explain precisely where there are differences and what they are, and
- explain precisely what is included in "other" categories.

### Time Periods

Inventories are prepared on a calendar year basis. In the Agriculture and Land-Use Change/Forestry categories, it may be desirable to estimate average emissions over a several year period. The *Workbook* methods describe default recommendations which are summarised in the table below.

TABLE 2-1 TIME PERIODS	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	PERIOD
<b>1 Energy</b>	
A Fuel Combustion Activities	Yearly figures
B Fugitive Fuel Emission	Yearly figures
<b>2 Industrial Processes</b>	
	Yearly figures
	Previous yearly figures
<b>3 Solvent and Other Product Use</b>	
	Yearly figures
<b>4 Agriculture</b>	
A Enteric Fermentation	Three-year average
B Animal Wastes	Three-year average
C Rice Cultivation	Three-year average
D Agricultural Soils	Three-year average
E Prescribed Burning of Savannas	Three-year average
F Field Burning of Agricultural Residues	Three-year average
<b>5 Land-Use Change/Forestry</b>	
A Changes in Forest and Other Woody Biomass Stocks	Three-year average
B Forest and Grassland Conversion	
- Immediate release from on-site burning	Three-year average
- Delayed release from decay	Previous 10 years average
C Abandonment of Managed Lands	Cumulative figures over previous 20 years Total figures more than 20 years ago
D CO <sub>2</sub> Emissions and Removals from soil	Yearly figures Previous 20 year figures
<b>6 Waste</b>	
	Yearly figures

Review these assumptions and be prepared to:

- explain if, and precisely where, your inventory has different time period assumptions, and
- explain the reasoning why the averaging periods were chosen.

## STEP 2 FILL IN THE SECTORAL AND SUMMARY REPORT TABLES

You should fill in Sectoral and Summary Report Tables for the main source/sink categories that you have included in your inventory. If your data do not conform to the IPCC source/sink category structure, you should

clearly footnote on the corresponding table(s) any differences and provide an explanation of the differences in the documentation note of the inventory. If you have estimated ranges of uncertainty for emission or supporting data, read Task (c) of this step before beginning.

### Task a: Complete Sectoral Report Tables.

EITHER: transfer emission estimates data from worksheets

OR convert your existing inventory data into Sectoral Report format (Tables 1 to 6). As explained above under Step 1, this may require transforming your data to fit the IPCC source/sink category structure.

### Task b: Complete Summary Report Tables.

This is done by transferring data from the Sectoral Report Tables into Summary Report Tables 7A & 7B.

### Task c: Report Uncertainty Ranges

An approach to estimating the uncertainty associated with point emission estimates and emission factors is described in Annex 1.

If you have ranges of uncertainty for point emission estimates by source/sink of greenhouse gas, as well as for emission factors or activity data, you can report the ranges by using the same Sectoral and Summary Report Tables. These tables should be in addition to the point estimates that are requested in Task (a) and (b) of this Step (above).

If you have ranges that you would like to report, please:

- make copies of the Sectoral or Summary Report Tables.
- mark them clearly with a heading "UNCERTAINTY RANGES" and the corresponding uncertainty area, e.g. EMISSION ESTIMATES, EMISSION FACTORS and/or ACTIVITY DATA.
- for each data point fill in the ranges if available.

## STEP 3 VERIFICATION

### Task a: Checking Results

Countries are asked to carry out the following types of verification and summarise results (in text form) in the inventory report:

- checks for arithmetic errors
- checks of country estimates against independently published estimates
- checks of national activity data with international statistics (default data)
- checks of CO<sub>2</sub> emissions from fuel combustion calculated using national methods with the IPCC Reference Approach (see below).

Further verification checks that may be done centrally, or assisted centrally are:

- cross-country comparisons of estimates through use of a single set of source categories

### CONVERTING CORINAIR INVENTORIES

CORINAIR is one type of detailed inventory system. Guidance for converting a CORINAIR Inventory into an IPCC inventory is given in Annex 2.

- cross-country comparisons of emission factors

A more detailed sample set of questions for countries to consider in reviewing the quality of their own inventories is provided below.

### **Verification**

In completing the inventory you should also make a report in which you summarise the verification procedures you have used. This report should include an overall assessment of the quality and completeness of each of the main source and sink estimates for each greenhouse gas. You should ask yourself the following questions about your inventory when attempting to provide an overall assessment of the inventory's quality and completeness.

### **Method**

- Is the approach well documented and reproducible?
- Have results been checked against other methods of estimation?
- Are measurement data part of the estimate? If so, has the source activity been summarised in part (for the remaining non-measured part of the activity) and has it been summarised in total? Have you verified that the emissions from a given activity are not included in several source categories?

### **Emission estimates**

- Have any estimates been compared with measured emission and concentration data?
- In some instances it is possible to cross-check emission estimates against roughly comparable statistics (e.g. for NMVOC, solvent production + imports - exports should equal total of applications). Have these checks been done and if so how do these data compare?
- Have results been compared for reasonableness with outside or independently published estimates? This could include comparison with estimates from a country of similar size or economic profile.

### **Activity data assumptions**

- Does the level of activity reported cross-check reasonably well with other sources of information on this activity, e.g. with international statistics?
- Do units match emission factors reported?

### **Emission factors**

- Do emission factors represent operating cycles or conditions from the region reporting?
- Are the sources of emission factors well documented? Are the conventions the same as those found in the activity data e.g. using net calorific value?
- Have emission factors been compared with other sources (taking into account technologies, maintenance, operating cycles, or other conditions that may influence emission factors)?

If you have already performed some verification, please describe what you did and what you found.

### **Task b: CO<sub>2</sub> from Fuel Combustion - Standard Verification**

With respect to CO<sub>2</sub> emissions from energy, all users are asked to provide a standard set of information that will assist the verification process. This means that:

- Users who have estimated their CO<sub>2</sub> emissions from energy using the Reference Approach outlined in *Volume 2* of the *Guidelines* should include the worksheets used to estimate these emissions in the documentation submitted with their inventory.
- Users who have used their own methodology or the IPCC Sectoral Approach to estimate CO<sub>2</sub> emissions from energy should present the results of their work in the Sectoral Table for Energy provided in the Reporting Instructions, along with the worksheets used for calculations. They should also estimate their CO<sub>2</sub> emissions from energy using the Reference Approach provided in *Volume 2* of the *Guidelines*. It is recommended that users provide (in text form) an explanation for any significant differences between these two sets of results.

### **Task c: Assessing Quality**

Prepare a brief self-assessment of the quality of the resulting inventory and of the verification that has been performed. A simplified format for reporting on the quality and completeness of the inventory is suggested in the Overview Table and Disaggregation Key (Tables 8A and 8B) in this book. This should be included with the other tables in the Inventory Report.

## STEP 4 DOCUMENTATION

Prepare text to accompany the inventory which should:

- describe any differences from IPCC source/sink category structure;
- describe any differences from IPCC default methods for the estimation of greenhouse gases and precursors;
- clearly describe the estimation methods, as well as major assumptions that may not have been captured in the worksheets, for all greenhouse gases contained in the inventory;
- provide complete references to all data sources used to construct the inventory;
- highlight any new or interesting data sources, references or research findings used to construct the inventory;
- describe any significant changes in emission factors and other assumptions from those used in previous inventories that have been submitted.

You are also invited to report any difficulties you faced in developing and reporting the inventory (e.g. lack of data, lack of resources etc.).

## STEP 5 ASSEMBLING AND TRANSMITTING THE INVENTORY

Assemble all elements of the National Inventory, including:

- Sectoral Report Tables
- Summary Report Tables
- Overview Table
- Uncertainty Estimates (if available)
- Written documentation
- Computer diskette containing data (if applicable)
- Any supporting documents

Mail the complete package to:

**IPCC/OECD/IEA PROGRAMME FOR NATIONAL  
GHG INVENTORY.**  
**OECD, Environment Directorate**  
**2, rue André-Pascal**  
**75775 PARIS CEDEX 16**  
**FRANCE**

**FAX: (33-1) 45 24 78 76**

## DOCUMENTATION STANDARDS

- National inventory reports should provide minimum information to enable the results to be reconstructed, and to justify the choice of methodology and data used. This means, for example, that to the extent possible, activity data should be provided at the level of detail at which the emissions are estimated.

- If worksheets from *Volume 2* of the *Guidelines* have been used to estimate greenhouse gas emissions in the inventory, these worksheets should be part of the documentation included in the inventory submission. Comparable worksheets should be provided when estimation procedures other than the IPCC Guidelines are used.

- Documentation should contain enough information to explain differences between national methods and data, and the IPCC default methods and assumptions. Reasons for the differences should be explained and sources of emission factors and other national data should also be clearly cited. Minimum requirements include: emission factors, activity data, and a list of references documenting any differences from IPCC recommendations.

- Measurement studies containing new values should be referenced, and made available upon request. It is preferable that new emission factors be taken from published sources.

- Any significant changes in emission factors and other assumptions from those used in previous inventories that have been submitted should be clearly referenced and explained.

- Documentation should be kept for future years (by the country and by the IPCC) and countries are encouraged to publish the documentation of their inventories. This extensive record keeping will facilitate the recalculation of historical inventory estimates when changes in national methods or assumptions occur.