National Inventories of Greenhouse Gas Emissions

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Inventory of Greenhouse Gas Emissions

United Nations Framework Convention on Climate Change (UNFCCC)

Paragraph 6: "Each non-Annex I Party shall, in accordance with Article 4,… of the Convention, communicate to the Conference of the Parties a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol…."

Gases Reported in National Communications

- **Obliged to report on:**
  - *Carbon Dioxide (CO2)*
  - *Methane (CH4)*
  - *Nitrous Oxide (N2O)*

- **Encourage to provide information:**
  - *Hydrofluorocarbons (HFCs)*
  - *Perfluorocarbons (PFCs)*
  - *Sulphur hexafluoride (SF6)*
  - *Carbon monoxide (CO)*
  - *Nitrogen oxide (NOx)*
  - *Non-methane volatile organizc compounds (NMVOCs)*
  - *Sulphur oxides (SOx)*

Sectors in GHG inventories

- Energy
- Industrial Processes
- Solvents and Other Products Use
- Agriculture
- Land-Use Change and Forestry
- Waste

- **Methodology: IPCC Guidelines for National Greenhouse Gas Inventories**
- **Base Year: 2000**
- **More countries providing inventories for a series of years**

Reporting Table. Inventory of National GHG Emissions

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 emissions (Gg)	CO_2 removals (Gg)	CH_4 (Gg)	N_2O (Gg)	CO (Gg)	NO_x (Gg)	NMVOCs (Gg)	SO_x (Gg)
Total national emissions and removals	X	X	X	X	X	X	X	X
1. Energy	X	X	X	X	X	X	X	X
A. Fuel combustion (sectoral approach)	X		X	X	X	X	X	X
1. Energy industries	X		X	X	X	X	X	X
2. Manufacturing industries and construction	X		X	X	X	X	X	X
3. Transport	X		X	X	X	X	X	X
4. Other sectors	X		X	X	X	X	X	X
5. Other (please specify)	X		X	X	X	X	X	X
B. Fugitive emissions from fuels	X		X		X	X	X	X
1. Solid fuels			X		X	X	X	X
2. Oil and natural gas			X		X	X	X	X
2. Industrial processes	X	X	X	X	X	X	X	X
A. Mineral products	X				X	X	X	X
B. Chemical industry	X		X	X	X	X	X	X
C. Metal production	X		X	X	X	X	X	X
D. Other production	X				X	X	X	X
E. Production of halocarbons and sulphur hexafluoride								
F. Consumption of halocarbons and sulphur hexafluoride								
G. Other (please specify)	X		X	X	X	X	X	X
3. Solvent and other product use	X			X			X	
4. Agriculture			X	X	X	X	X	X
A. Enteric fermentation			X					
B. Manure management			X	X			X	
C. Rice cultivation			X				X	
D. Agricultural soils			X	X			X	
E. Prescribed burning of savannahs			X	X	X	X	X	
F. Field burning of agricultural residues			X	X	X	X	X	
G. Other (please specify)			X	X	X	X	X	
5. Land-use change and forestry	X[b]	X[b]	X	X	X	X	X	X
A. Changes in forest and other woody biomass stocks	X[b]	X[b]						
B. Forest and grassland conversion	X	X	X	X	X	X		
C. Abandonment of managed lands		X						
D. CO_2 emissions and removals from soil	X[b]	X[b]						
E. Other (please specify)	X	X	X	X	X	X		
6. Waste			X	X	X	X	X	X
A. Solid waste disposal on land			X		X		X	
B. Waste-water handling			X	X	X	X	X	
C. Waste incineration					X	X	X	X
D. Other (please specify)			X	X	X	X	X	X
7. Other (please specify)	X	X	X	X	X	X	X	X
Memo items								
International bunkers	X		X	X	X	X	X	X
Aviation	X		X	X	X	X	X	X
Marine	X		X	X	X	X	X	X
CO_2 emissions from biomass	X							

Notes: Shaded cells do not require entries.

[a] The following standard indicators should be used, as appropriate, for emissions by sources and removals by sinks of GHGs: **NO** (not occurring) for activities or processes that do not occur for a particular gas or source/sink category within a country, **NE** (not estimated) for existing emissions and removals which have not been estimated, **NA** (not applicable) for activities in a given source/sink category which do not result in emissions or removals of a specific gas, **IE** (included elsewhere) for emissions and removals estimated but included elsewhere in the inventory (Parties should indicate where the emissions or removals have been included), **C** (confidential) for emissions and removals which could lead to the disclosure of confidential information.

[b] Do not provide an estimate of both CO_2 emissions and CO_2 removals. "Net" emissions (emissions - removals) of CO_2 should be estimated and a single number placed in either the CO_2 emissions or CO_2 removals column, as appropriate. Note that for the purposes of reporting, the signs for removals are always (-) and for emissions (+).

Challenges of data collection

- A wide range of sectors and sources of emissions within sectors (almost all socio-economic areas are involved)
- Lack of data for a given source for the base year
- Complete lack of data for a given source
- Reliability of available information
- Inconsistencies of time series, e.g. changes in definition, survey methods
- Data classification system incompatible with required format as per the GHG inventory methodology
- Access to activity data may be restricted (e.g. confidentiality issues)

Challenges of data collection, cont.

- Statistics at national level often lacks the capacity and resources to meet data needs for GHG inventory purposes
- Difficulties in identifying institutions responsible for data collection
- More than one institution retaining data for a given source category
- Contradictory data from different sources of information
- Legal issues or fees associated with obtaining data

Key factors to consider in GHG inventory

- Compiling a national GHG inventory requires a fairly lengthy and interconnected series of tasks.
- GHG inventory requires fundamental decisions on
  - Methods for data collection to meet inventory needs,
  - network of contacts (stakeholders)
  - institutional arrangements required to ensure continuity,
  - system for data management,
  - quality assurance and quality control,
  - documentation and archiving.
- Inventory process should thus be planned, operated and managed to ensure quality, efficiency and sustainability
- Addressing data gaps and improving reliability of database are critical, as countries produce their future inventories and intend to provide inputs to relevant policy decisions.

The way forward

- Ensure close coordination between statistics units and National Communications teams
- Understand data requirements, including format, frequency, spatial resolution, etc.
- Identify gaps and prioritize according to relevance of source (e.g. contribution to total GHG emissions)
- Identify opportunities for improvement of current data procedures
- Design a strategy for gap fillings and sustainability of data collection and management