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Introduction to Methodologies for GHG emissions inventories and Paris Agreement reporting

Part 2. General methodologies and reporting

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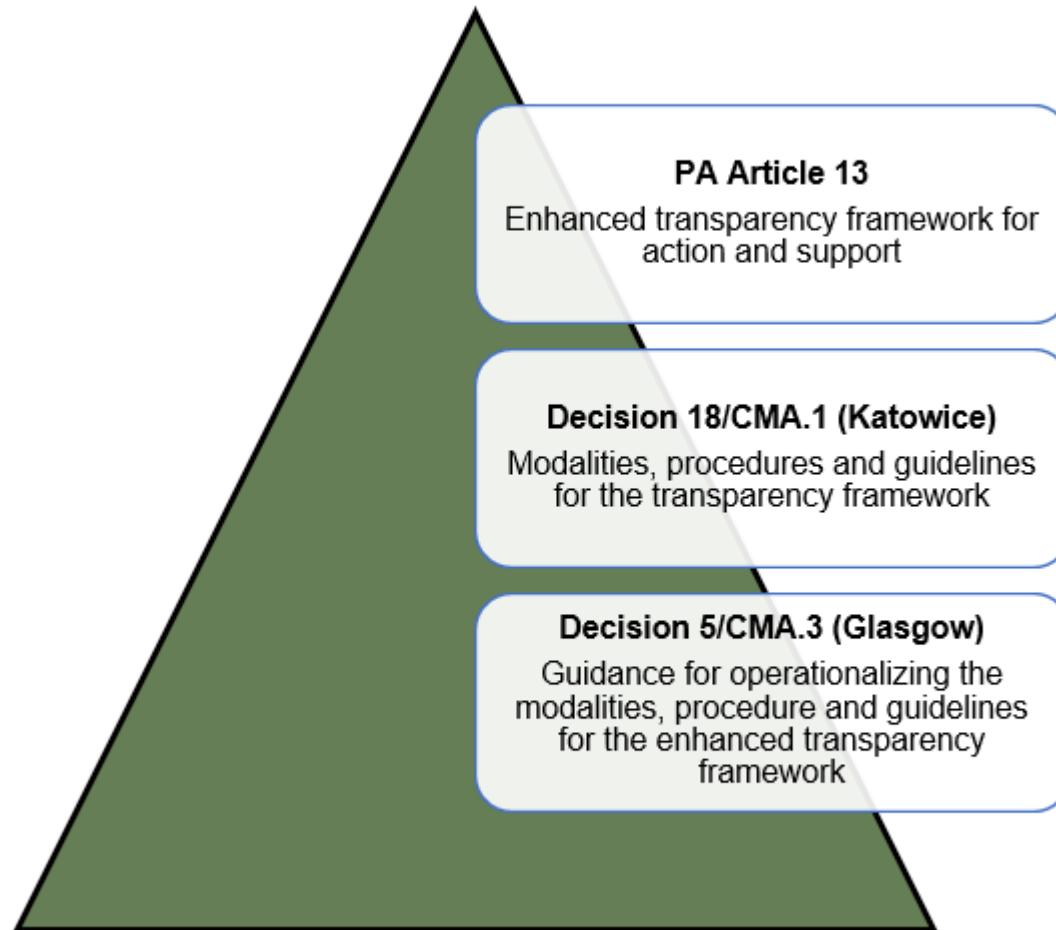
2022

A large, faint background graphic featuring a stylized tree with a thick trunk and a canopy of leaves, set against a circular sun with a serrated edge. The sun is light yellow, and the tree is a muted green. The entire graphic is centered on the slide.

Outline

- 1. Key decisions and methodological guidelines**
- 2. Methodologies for estimating and reporting GHG emissions and removals**

Hierarchy of decisions

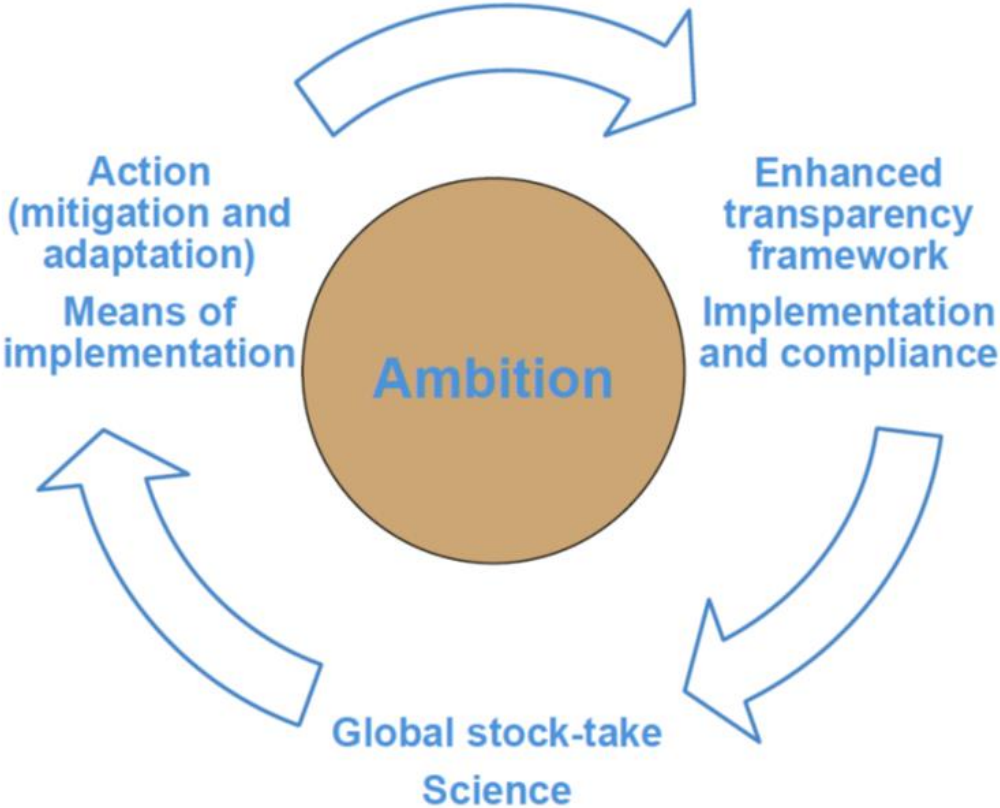


Key decisions and methodological guidelines

Reporting of greenhouse gas (GHG) anthropogenic emissions and removals is governed by **Article 13 of the Paris Agreement**:

- “In order to build mutual trust and confidence and to promote effective implementation, **an enhanced transparency framework for action and support**, with built-in flexibility which takes into account Parties' different capacities and builds upon collective experience is hereby established.”
- The transparency framework shall build on and enhance the transparency arrangements under the Convention, recognizing the special circumstances of the least developed countries and small island developing States, and be implemented in a facilitative, non-intrusive, non-punitive manner, respectful of national sovereignty, and avoid placing undue burden on Parties.
- The purpose of the framework for transparency of action is to provide a clear understanding of climate change action in the light of the objective of the Convention as set out in its Article 2, including clarity and tracking of progress towards achieving Parties' individual nationally determined contributions under Article 4... including good practices, priorities, needs and gaps, to inform the global stocktake under Article 14.

Role of the Enhanced Transparency Framework in the implementation of the Paris Agreement



Source: UNFCCC

Modalities, procedures and guiding principles for the enhanced transparency framework (MPGs)

MPGs were adopted by the **Decision 18/CMA.1 (Katowice, 2018)**. Their guiding principles are:

- The importance of facilitating improved reporting and transparency over time;
- Providing flexibility to those developing country Parties that need it in the light of their capacities;
- Promoting transparency, accuracy, completeness, consistency and comparability;
- Avoiding duplication of work and undue burden on Parties and the secretariat;
- Ensuring that Parties maintain at least the frequency and quality of reporting in accordance with their respective obligations under the Convention;
- Ensuring that double counting is avoided;
- Ensuring environmental integrity.

Guidance operationalizing the modalities, procedures and guidelines for the enhanced transparency framework

The Guidance was adopted at of the Glasgow conference in 2021.

In particular, were adopted:

- The common reporting tables for the electronic reporting of the information in the national inventory reports of anthropogenic emissions by sources and removals by sinks of greenhouse gases;
- The outlines for the biennial transparency report and national inventory document;
- The outline for the technical expert review report including of the national inventory;
- The training programme for technical experts participating in the technical expert review

The UNFCCC secretariat was requested to develop reporting tools for the electronic reporting of the common reporting tables and common tabular formats.

Also, the Glasgow decision encouraged developing country Parties to prepare and submit project proposals in order to receive financial support from the Global Environment Facility for preparing their biennial transparency reports (including the GHG inventory information).

Current UNFCCC decisions on the Annex I Parties inventory reporting and review

The PA enhanced transparency framework is built on the currently used transparency arrangements under the UNFCCC, mainly those adopted for the Annex I Parties reporting. Key reporting and review guidelines still in force in the pre-PA reporting period are:

- Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories
 - ✓ Adopted by the UNFCCC Conference of the Parties Decision 24/CP.19 in 2013.
- Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention under Article 14
 - ✓ Adopted by the UNFCCC Conference of the Parties Decision 13/CP.20 in 2014.

It is expected that the UNFCCC reporting guidelines for national GHG inventories will be harmonized with the PA reporting guidelines.

Methodologic Guidelines for the national inventories preparation

Guidelines adopted for mandatory use both under UNFCCC and PA:

- Intergovernmental Panel on Climate Change (IPCC) *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Guidelines adopted for voluntary use under UNFCCC and PA:

- The Intergovernmental Panel on Climate Change *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetland*

Guidelines adopted for voluntary use under PA:

- The Intergovernmental Panel on Climate Change *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Institutional arrangements

Each Party should implement and maintain national inventory arrangements, including institutional, legal and procedural arrangements for the continued estimation, compilation and timely reporting of national inventory reports in accordance with MPGs.

National inventory arrangements can vary by Party depending on their national circumstances and preferences, and change over time.

Each Party should, to the extent possible, identify, update regularly and include in the biennial transparency report information on improvements to its reporting, including with respect to GHG emissions and removals.

Methodologies: guiding principles

To estimate anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol the Parties shall use:

- Methodologies provided by the IPCC Guidelines and adopted by the UNFCCC Conference of the Parties and/or PA Meeting of the Parties;
- Any supplementary methodologies agreed by the COP;
- National methodologies which they consider better able to reflect their national situation, provided that these methodologies are compatible with the 2006 IPCC Guidelines and are well documented and scientifically based.

Estimates of emissions and removals are grouped **by sector**. Sectors combine homogeneous activities (processes), sources and sinks:

- Energy
 - ✓ Fuel Combustion;
 - ✓ Fugitive Emissions from Fuels;
- Industrial Processes and Fuel Use (IPPU);
- Agriculture;
- Land Use, Land Use Change and Forestry (LULUCF);
- Waste;
- Other (if any).

Key categories

In the development of the inventory, an analysis should be carried out to identify **key categories**. A key category is a category that has a significant influence on the total (aggregate) emissions of greenhouse gases, or on the trend of total emissions over time, or on the uncertainty of total emissions.

Identified key categories should be given priority in the allocation of resources on:

- Data collecting and analyzing;
- Quality assurance/quality control;
- The reporting development.

The analysis for identifying key categories is carried out in two ways: taking into account and excluding the land use, land-use change and forestry sector.

The inventory shall include the results of the identification of key categories for the base year and for the last reporting year.

Good practice and tiers

Good practice is a set of inventory methodological principles, actions and procedures.

Inventories that are consistent with good practice are those that appear to contain neither overestimation nor underestimation, and where uncertainties are reduced as much as practicable.

The 2006 IPCC Guidelines provide good practice guidance for specific emissions/sinks categories and for general inventory procedures.

For each source or sink category, the 2006 Guidelines provide at least two methodologies for estimating emissions or removals of greenhouse gases.

- **Tier 1 methodologies** are the simplest, requiring less resources on collection the necessary data and producing emission/sink estimates.
- **Tier 2 and tier 3 methodologies** may involve the collection of information from individual facilities, mass balance approach, using nationally developed emission factors, etc.

Good practice and tiers

To estimate GHG emission or removal in the specific category of sources or sinks the numeric information on **activity data** and **emission factor** are necessary.

For each category, the 2006 IPCC Guidelines contain the tier 1 (default) methodologies.

These methodologies include default emission factors and, in some cases, default activity data.

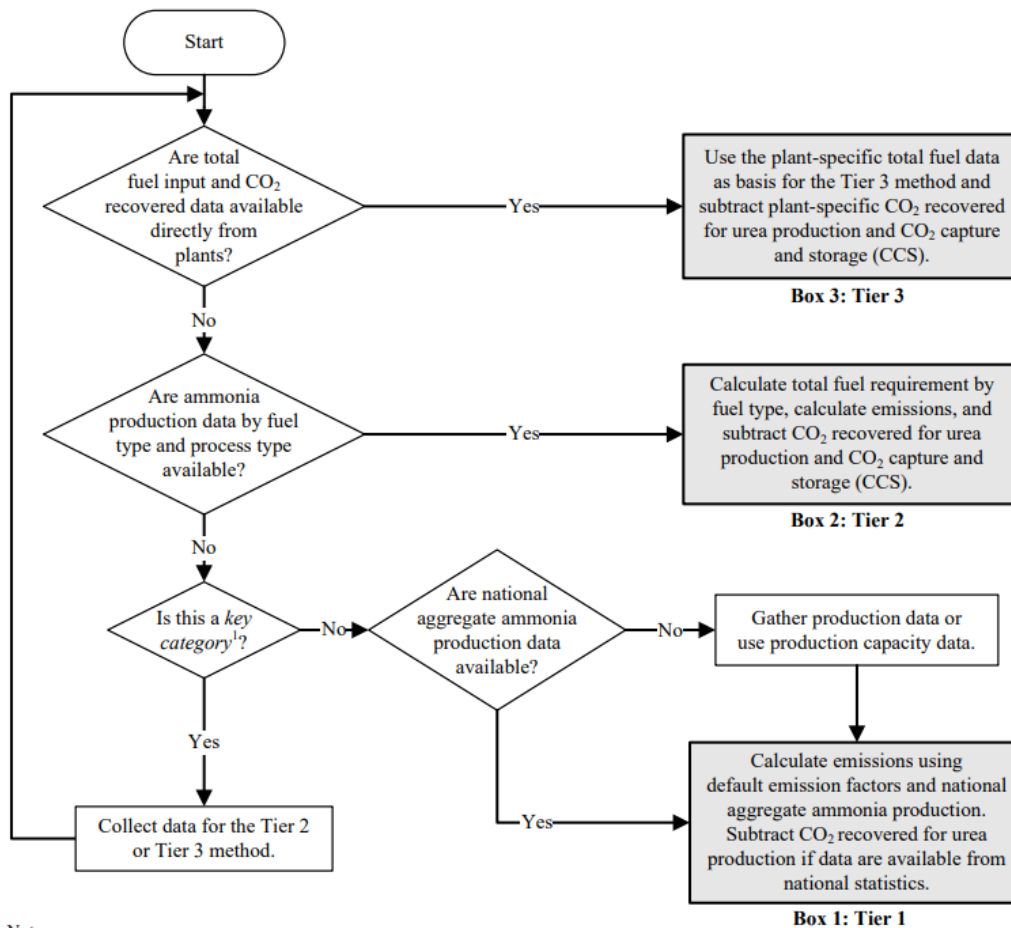
For the key sources tier 2 or tier 3 methodologies should be used.

Parties should use their own national emission factors or methodologies and if available, provided that they are developed in accordance with the IPCC Guidelines and considered to be more accurate than the default ones.

Where country-specific information is not available, emission factors or other parameters provided in the IPCC Emission Factor Database (EFDB) may be used, if a Party can demonstrate that these parameters are appropriate for its specific national circumstances and are more accurate than the default values in the IPCC Guidelines.

Decision trees

To ensure the correct approach to selecting methodologies, the IPCC Guidelines provide **decision trees**.



Note:

Example: decision tree for the *Ammonia Production* category in the *Industrial Processes and Product Use* sector.

The IPCC Guidelines provide three methodological levels for this category. The choice of level depends on national circumstances and on whether ammonia production is a key category.

Uncertainties

Emissions/removals uncertainty estimates should be quantified for all source and sink categories. An analysis of the uncertainty of the total GHG emissions and the uncertainty of the total emission trend shall be also done.

The IPCC Guidelines provide two approaches to assessing uncertainties:

- Approach 1 is based on using a relatively simple method (error propagation method);
- Approach 2 involves the use of the Monte Carlo or similar methods.

As a minimum, approach 1 should be implemented in the inventory.

Use of approach 2 or a combination of approaches 1 and 2 is also recommended.

Uncertainty estimates should be done for the base year, for the last year of the Inventory, and for the trend of total emission between those two years.

General methodological issues

In each category, estimates of emissions and removals for the entire time series included in the inventory (base year and all subsequent years) should be made using the same methodologies; activity data and emission factors should be obtained in a consistent manner.

- This approach provides undistorted estimate of emission/removal trend.

In some cases it may not be possible to use the same methods and consistent datasets for all years. In such cases, emissions or removals are calculated using alternative methods. Alternative methods are provided in the 2006 IPCC Guidelines.

- Information on the alternative methods used should be documented and included in the inventory.

Recalculations of emissions and removals are performed to improve the accuracy and/or completeness of the inventory. Reasons for recalculations is discussed in more detail in the IPCC Guidelines. When performing recalculations, the consistency of time series should be ensured.

- In the event of a change in the methodology or method of collecting the respective activity data or emission factor, Parties should recalculate their inventories for the base year and subsequent years of the time series.

Quality assessment and quality control (QA/QC)

Each Party shall develop an inventory QA/QC plan and implement the overall quality control procedures in accordance with the plan, following the 2006 IPCC Guidelines.

Category-specific quality control procedures should also be applied for key categories and for those categories that have undergone significant methodological changes and/or data revision.

In addition, it is necessary to carry out an independent peer reviews of inventories in accordance with the 2006 IPCC Guidelines; this reviews is also an element of quality assurance procedures.

A significant role in improving the quality of the inventory is played by the implementing recommendations of the **technical expert reviews** and **facilitative, multilateral consideration of progress**.

Flexibility for developing countries

The application of **flexibility** for those developing country Parties that need it in the light of their capabilities is left to the discretion of the reporting Party. The Party shall clearly indicate the provision to which flexibility applies, briefly explain its limitations, and indicate its self-determined approximate time frame for improvements associated with such limitations of its capabilities.

- The right to identify key categories using a threshold of at least 85% (instead of the 95% threshold specified in the 2006 IPCC Guidelines);
- The right to provide a qualitative uncertainty analysis instead of a quantitative one for key categories (in cases where there are no quantitative data for uncertainty analysis);
- The right to apply higher thresholds to cut off minor (not assessed in inventories) categories.
- The right to develop a quality assurance and control plan and to provide information on general quality control procedures on a voluntary basis.

Flexibility for developing countries

The mandatory provisions for developing countries using flexibility are:

- Providing information on at least three greenhouse gases (CO₂, CH₄ and N₂O);
- Reporting on HFCs, PFCs, SF₆ and NF₃ if they are included in their nationally determined contributions under Article 4 of the Paris Agreement, or if they are covered by an activity under Article 6 of the Paris Agreement, or if they have already been reported information earlier.

Each Party shall provide annual data series since 1990; those developing countries that need flexibility should, at a minimum, provide data covering the base year (period) for their nationally determined contributions and, in addition, annual data series going back to at least 2020.



Thank you!

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