

# ELABORATING THE PARIS AGREEMENT: NATIONAL GREENHOUSE GAS INVENTORIES



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A fundamental feature of the “enhanced transparency framework” established by Article 13 of the Paris Agreement is the regular provision by each party of a national inventory report of greenhouse gas emissions by sources and removals by sinks. Article 13 also states that the transparency framework shall provide flexibility “to those developing country parties that need it in the light of their capacities.”

This brief provides an overview of the Agreement’s inventory provisions; existing inventory requirements under the U.N. Framework Convention on Climate Change (UNFCCC); key dimensions of inventory reporting where flexibility may be a consideration; and options for operationalizing flexibility to developing countries that need it.

## THE AGREEMENT’S INVENTORY PROVISIONS

Article 13.7 of the Paris Agreement requires that each party regularly provide a national inventory of greenhouse gas emissions and removals, as well as the information necessary to track progress in implementing and achieving its nationally determined contribution. Article 13.8 states that this information shall undergo a technical expert review. The governing body of the Paris Agreement, known as the CMA, is to adopt common modalities, procedures, and guidelines (MPGs) implementing these and other provisions of the transparency framework.

Reliable greenhouse gas inventories are important in tracking both parties’ individual progress in achieving their nationally determined contributions (NDCs) and collective progress toward the agreement’s long-term goals. Article 13.7(a) specifies that greenhouse gas inventory reports should be prepared “using good practice methodologies accepted by the Intergovernmental Panel on Climate Change” (IPCC) and agreed upon by the CMA. A decision by parties accompanying the Paris Agreement, called Decision 1/CP.21, further states that the MPGs should “maintain at least the frequency and

quality of reporting” presently required of parties, and should facilitate “improved reporting and transparency over time.”

Along with providing flexibility to developing countries needing it in light of their capacities, Article 13 states that support shall be provided to build transparency-related capacity “on a continuous basis.” In addition, Decision 1/CP.21 establishes the Capacity-building Initiative for Transparency, which aims to strengthen national institutions and provide tools, training, and assistance.

## INVENTORY REPORTING UNDER THE CONVENTION

Present greenhouse gas inventory requirements, like other reporting requirements under the Convention, differ for developed and developing countries.

Reporting requirements are mandatory for Annex I (developed) countries, which submit national inventories annually as a separate report, as well as information on inventories in their national communications and biennial reports. Non-Annex I (developing) countries report inventory information,

**TABLE 1: Existing Inventory Requirements**

	ANNEX I PARTIES	NON-ANNEX I PARTIES
<i>Methodologies</i>	2006 IPCC Guidance	Encouraged to use 1996 IPCC Guidance
<i>Scope</i>	All Gases / Sectors	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O (as appropriate, to the extent possible)
<i>Detail</i>	Common Reporting Format	Encouraged to use tables in 1996 Guidance
<i>Time Series</i>	<b>Start:</b> 1990 <b>End:</b> Reporting Year minus 2 (x-2) <b>Consistency:</b> Time series consistent methodologies from 1990.	<b>Start:</b> single year - 1990 or 1994 for NC1; 2000 for NC2 <b>End:</b> Reporting Year minus 4 (x-4) <b>Time Series not required</b>
<i>Frequency</i>	Annual	Biennial
<i>Vehicle</i>	National Inventory Report; Biennial Report; National Communication	Biennial Update Report; National Communication

without mandatory requirements on level of detail or format, in their national communications and biennial updates reports (BURs), not as a stand-alone report, and have far greater discretion in what and how they report. Least developed countries report at their discretion. **Table 1** summarizes these and other differences in current reporting requirements.

The ability to present reliable high-quality data on a regular basis generally requires some form of national arrangement to facilitate data collection and estimation.. Many developing countries still compile and report greenhouse gas inventories on an ad-hoc basis, in association with their national communications or BURs, relying heavily in some cases on external expertise. Many have yet to establish strong internal capacities, particularly with respect to sources or sectors that are not significant in their national emissions profiles.

## KEY DIMENSIONS OF INVENTORY REPORTING

In elaborating on Article 13’s general provision of flexibility to developing countries in light of capacity, Decision 1/CP.21 states that such flexibility can be in the “scope, frequency, and level of detail of reporting.”

How flexibility is operationalized may vary across the various elements of the transparency framework. One key consideration in each case is the question of “who” – which parties require flexibility, and how that is determined. The MPGs could address that question by establishing criteria for when flexibility applies and/or by

leaving it to each developing country to decide for itself.

In the case of greenhouse gas inventories, the question of flexibility could apply across some or all of the key dimensions of inventory reporting, which include

- the methodologies employed
- inventory scope (sectors and gases)
- time series consistency (how a party applies changes in methodology to previous years)
- how far back a party’s inventory reflecting these changes extends)
- the frequency of reporting
- data reporting formats
- reporting vehicle.

## IPCC METHODOLOGIES

Article 13.7(a) specifies that inventory reports should be prepared “using good practice methodologies accepted by” the IPCC and “agreed by the CMA.”

Methodologies describe the approaches to be used in estimating greenhouse gas emissions and removals. The IPCC regularly updates its guidance to reflect new science and research that allows for greater detail and improved accuracy. The latest updated guidance, provided by the IPCC in 2006, is mandatory for developed countries. Developing countries may continue to rely on the IPCC’s earlier guidance, provided in 1996, although many have chosen to adopt the 2006 guidance. The IPCC is currently working on new updates, expected in 2019. Its new guidance may be a simple iterative update of the 2006 guidance or represent a fully new suite.

Both the 1996 and the 2006 the guidance provide inherent flexibility in estimating greenhouse gas estimates through a party's choice of "tiers." Tier 1 methodologies are available for a broader set of categories—these methodologies are simpler, and provide for complete reporting, but with less accuracy. Tier 2 and 3 methodologies are progressively more accurate and complex. Parties may choose different tiers for different reporting categories. Beyond the tiers, the IPCC good practice guidance provides flexibility in the level of detail provided and in the determination of a consistent time series.

Both the 1996 and the 2006 guidance provide for greater or lesser detail in describing the methods, data sources and assumptions used in greenhouse gas estimations. In categories where no estimates are provided, Parties can use "notation keys" to indicate where emissions have been aggregated with other categories (Included Elsewhere, or IE), are not estimated (NE), or are not occurring (NO). Parties provide documentation and justification for the use of notation keys with a goal to provide explicit estimates over time.

For time series consistency, in both the 1996 and 2006 guidance, the presentation of trends and time series consistency is encouraged, yet there is flexibility to present estimates for single or a range of years, and simple guidance on developing time series consistent approaches is provided.

The 2006 IPCC guidance represents a move to a more complete set of methodologies relative to the 1996 guidance. For example, it contains updated methods for estimation and includes these for a broader set of sources and sinks. It also contains updated default emissions factors and provides an online tool for simple estimation.

The 2006 guidance provides parties additional flexibility relative to the 1996 guidance by offering tier 1 methodologies for a broader set of categories and by simplifying the choice of method relative to available resources.

However, transitioning from 1996 to 2006 guidance can pose challenges as a party adopts new methodologies, and support likely would be needed in some cases. Switching from the 1996 to the 2006 guidance will also result in a party's inventory reflecting different and, in many cases, higher greenhouse gas totals. This could be problematic where a party has planned for NDC

implementation using previous estimates. The application of new emissions factors might also be challenging for parties that have developed country-specific tier 2 or 3 methodologies for a particular sector using the 1996 guidance.

One way to apply flexibility is for the MPGs to encourage the use of the most recent guidance and make this mandatory only for the subsequent NDC. With strong capacity-building support, more parties likely would apply the most recent guidance, but this likely would mean that some would not apply the latest available guidance until 2031.

## SCOPE

Another potential area of flexibility is in the scope of the sectors and gases covered by a party's inventory. The IPCC has developed key category analysis to assist parties in deciding which emissions or removals categories to prioritize in order to make the most efficient use of available resources. A category is considered "key" if, when categories are ordered by magnitude, it is one of those contributing to 95 percent of total national emissions or removals, or to 95 percent of the trend in national emissions or removals.

In the context of flexibilities, a party would presumably prioritize the gases and sectors covered by its NDC. When a party is unable to report on all gases and sectors, even using simple tier 1 estimates, it may be necessary to report on a limited number of gases/sectors, such as those indicated in the key category analysis, or to start with a very simple sub-tier 1 estimate. The concept of key category analysis could be expanded in the MPGs to offer greater flexibility. For instance, the threshold could be set lower than 95 percent to ensure that available resources are focused on the most important sources of emissions.

## TIME SERIES AND TIME SERIES CONSISTENCY

A time series—which provides annual estimates of emissions over a series of years, applying a consistent methodology to both current and previous years—provides valuable information on emissions and removals trends. To provide an accurate trend, a time series needs to be consistent in its methodology, data sets, and assumptions. Emissions estimates need to be updated for each year in the time series when

new methodologies, data sources or assumptions are applied; this may present a challenge for parties that to date have only reported emissions on an ad hoc basis for single years.

A longer time series is more helpful in identifying significant trends. However, for some parties an early base year (e.g., 1990) may not be possible due to a lack of data. Similarly, the more recent the emissions data, the more accurately an inventory reflects a country's emissions. For developed countries, the current system requires that national inventories be produced on the basis of current year "minus 2" (referred to as X-2, where a 2014 report contains the greenhouse gas inventory estimates of emissions and removals up to 2012). For developing countries, reporting is on a current year "minus 4" basis (referred to as X-4, where a 2014 report contains the greenhouse gas inventory of or up to emissions in 2010). The ability to report emissions in more recent years is largely a function of the capacity and national arrangements in place for the compilation of an inventory.

In the context of flexibility, the MPGs could provide for time series consistency as far back as practical given the availability of historic data. For instance, parties could report inventories for the past 10 years or back to the base year, if relevant, that they chose in defining their NDC. All parties also could initially be encouraged, and over time required, to report inventories on a current year "minus two" basis

## REPORTING FREQUENCY

Decision 1/CP.21 requires that parties maintain the frequency of current reporting requirements and that they report a greenhouse gas inventory at least biennially. It also specifies that LDCs and SIDS submit at their discretion.

Updating greenhouse gas estimates regularly helps parties retain expertise, data flows, and stakeholder engagement. It also facilitates the regular demonstration of individual and collective progress. These benefits need to be weighed against the capacity and resource requirements required to report more frequently and the ability of the system to manage reported information, including through review.

For the application of flexibility, the MPGs could encourage, and over time require, all parties to report annually.

## DATA REPORTING FORMATS

The use of standard reporting formats allows greater comparability across national inventory reports. Where they call for greater detail, these common tabular formats also contribute to stronger transparency and understanding. At the same time, it may not be possible for all parties to report at the specified level of detail and/or in the specified format, particularly when their capacity to estimate emissions and removals is limited.

To offer flexibility, the MPGs could provide for a standard format that allows for flexibility in the level of detail provided, using or building on the flexibility already provided in the IPCC guidance through notation keys.

## REPORTING VEHICLE

Currently, developed country parties submit a national inventory annually as a stand-alone report. Information on greenhouse gas inventories is submitted by developing countries in their biennial update report and national communications. A stand-alone national inventory report has some advantages in terms of transparency and review, as information related to greenhouse gas emissions and the methods and arrangements used in their estimation is considered by itself, and not in conjunction with the other information required in the enhanced transparency framework. At the same time, a stand-alone inventory report creates an additional reporting obligation for developing countries which could require additional resources.

## OPTIONS: FLEXIBILITY IN INVENTORY REPORTING

The above discussion highlights a number of broad approaches for operationalizing flexibility in greenhouse gas inventory reporting for developing countries that require it in light of their capacities. Generally, these approaches provide for continuous improvement in inventory reporting while allowing for capacity-based flexibility in the initial stages. (They do not explicitly address requirements for LDCs and SIDS who report at their discretion.) The following summarizes ways flexibility could be applied, including

through some transitional arrangements which still ensure that the MPGs can apply to all parties from the outset:

### **Methodologies**

- Developing countries are initially encouraged to use the most recent IPCC guidance (e.g. 2006) and obliged to move to current guidance over time (e.g. from 2025, for the subsequent NDC etc).

### **Scope**

- Developing countries are required to report on all categories included in their NDC using at least tier one estimates, and on all key categories based on a 95 percent (or lower) threshold.

### **Time Series and Consistency**

- *Start Date*—Developing countries are encouraged to report from 1990, and required to report from

the earliest start date possible either depending on data availability; for the last 10 years; from 2010; or from historical base years indicated in their NDC.

- *End Date*—Developing countries are encouraged to report on a “minus two” basis and are required to move to a “minus two” basis over time.
- *Consistency*—Developing countries encouraged to provide time series consistency from the start date and obliged to provide time series consistency for at least 10 years.

### **Reporting Detail**

- All parties report using a common tabular format which provides flexibility to reflect different levels of detail.

## Other C2ES Resources:

*Accounting Approaches Under Article 6 of the Paris Agreement*, August 2018

<https://www.c2es.org/document/accounting-approaches-under-article-6-of-the-paris-agreement/>

*Elaborating the Paris Agreement: Transparency of Finance*, August 2018

<https://www.c2es.org/document/elaborating-the-paris-agreement-transparency-of-finance/>

*General Issues in Elaborating the Paris Agreement*, April 2018

<https://www.c2es.org/document/general-issues-in-elaborating-the-paris-agreement>

*Accounting for Bottom-Up Trading Under the Paris Agreement*, April 2018

<https://www.c2es.org/document/accounting-for-bottom-up-trading-under-the-paris-agreement>

*Elaborating the Paris Agreement: Implementation and Compliance*, November 2017

<https://www.c2es.org/document/elaborating-the-paris-agreement-implementation-and-compliance>

*Elaborating the Paris Agreement: Information and Accounting*, November 2017

<https://www.c2es.org/document/elaborating-the-paris-agreement-information-and-accounting>

*ICAO's CORSIA and the Paris Agreement: Cross-Cutting Issues*, November 2017

<https://www.c2es.org/document/icaos-corsia-and-the-paris-agreement-cross-cutting-issues/>

*Elaborating the Paris Agreement: Potential Linkages Between Articles 13, 14, and 15*, October 2017

<https://www.c2es.org/document/elaborating-the-paris-agreement-potential-linkages-between-articles-13-14-and-15>



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