



CO2 cross-border transport and storage in IPCC GHG Inventories Guidelines

February 8, 2024

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Obligation about GHG Inventory under Article 4.1 (a) of UNFCCC

- ▶ Article 4.1 (a) of the United Nations Framework Convention on Climate Change (“UNFCCC”) sets forth the Parties’ obligations regarding “GHG Inventory” as follows:

1. All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:
 - (a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;
— (Omitted)—

Function of GHG Inventory in Japan

- ▶ On its website, the Ministry of the Environment (Japan) explains the function of its GHG Inventory as follows: ※

The amount of greenhouse gas emissions and absorptions in the GHG Inventory is important basic data for assessing the progress and achievement of Japan's internationally stated greenhouse gas emission reduction targets, such as the 2020 emission reduction targets under the Cancun Accords, the 2030 emission reduction targets under the Paris Agreement, and the realization of carbon neutrality by 2050.

It will also be used as basic data for the Global Warming Countermeasures Plan, which stipulates various domestic measures and measures to achieve these goals.

※ <https://www.env.go.jp/earth/ondanka/ghg-mrv/overview.html>, as of January 2024.

Decision 24 at COP 19

- ▶ **Decision 24, adopted by the Conference of the Parties (“COP 19”) held in Warsaw in November 2013 (24/CP. 19) revised the UNFCCC Reporting Guidelines of the GHG Inventory included in Annex I to UNFCCC as follows*:**

The Conference of the Parties,

Recalling Article 4, paragraph 1, Article 10, paragraph 2, and Article 12, paragraph 1, of the Convention;

— (Omitted)—

1. Adopts the revised “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” contained in annex I, the revised common reporting format tables contained in annex II and the global warming potential values contained in annex III;

— (Omitted)—

* <https://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf>

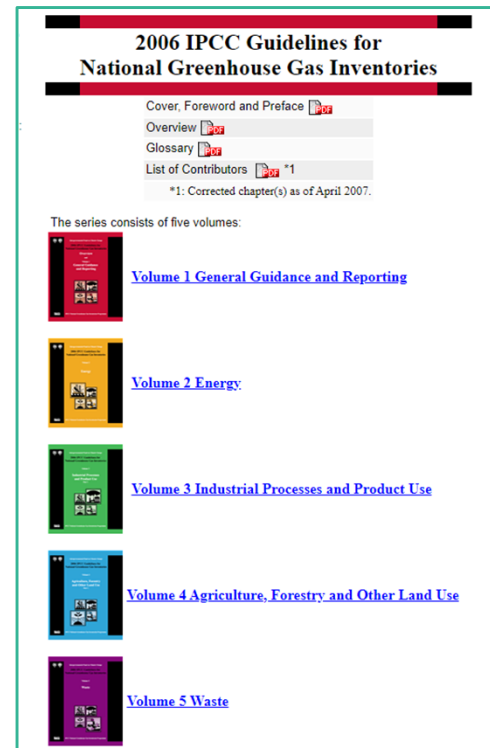
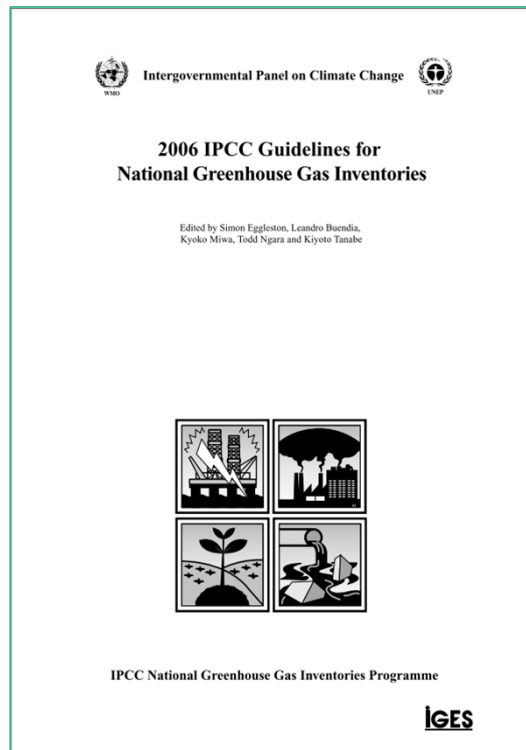
The UNFCCC Guidelines revised by Decision 24 at COP 19

- The UNFCCC Guidelines, revised by Decision 24 at COP 19, which is attached as “Annex I” to the COP 19 report,[※] states that in principle, the Parties shall use the methodologies provided in the IPCC GHG Inventories Guidelines, as follows:

Methodology

- 9. Annex I Parties shall use the methodologies provided in the 2006 IPCC Guidelines, unless stated otherwise in the UNFCCC Annex I inventory reporting guidelines, and any supplementary methodologies agreed by the COP, and other relevant COP decisions to estimate anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol.**
- 10. Annex I Parties may use different methods (tiers) contained in the 2006 IPCC Guidelines, prioritizing these methods in accordance with the 2006 IPCC Guidelines. Annex I Parties may also use 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.**

CCS in IPCC GHG Inventories Guidelines



<https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>

CO2 Transfer and Storage in IPCC GHG Inventories Guidelines

[Vol.1 General Guidance and Reporting] [Chapter 8 Reporting Guidance and Tables]

► 8.5 of Vol.1 General Guidance and Reporting] [Chapter 8 Reporting Guidance and Tables] explains Table 8.2, stating that “Table 8.2 introduces the classification and definition of categories and subcategories of emissions and removals (consistent with the sectoral, sectoral background and cross-sectoral tables provided in Annex 8A.2)”. Table 8.2 also categorizes and defines “CO2 transport and storage” and “CO2 Injection and Storage,” as shown on the right:

Category Name	Code	and	Definition	96 GLs Category Code	Gases
1 C	Carbon Dioxide Transport and Storage		Carbon dioxide (CO2) capture and storage (CCS) involves the capture of CO2 from anthropogenic sources, its transport to a storage location and its long-term isolation from the atmosphere. Emissions associated with CO2 transport, injection and storage are covered under category 1C. <u>Emissions (and reductions) associated with CO2 capture should be reported under the IPCC Sector in which capture takes place (e.g. Fuel Combustion or Industrial Activities).</u>		CO2,
1 C 1	Transport of CO2	of	<u>This comprises fugitive emissions from the systems used to transport captured CO2 from the source to the injection site.</u> These emissions may comprise losses due to fugitive equipment leaks, venting and releases due to pipeline ruptures or other accidental releases (e.g., temporary storage).		CO2,
1 C 1 a	Pipelines		Fugitive emissions from the pipeline system used to transport CO2 to the injection site.		CO2,
1 C 1 b	Ships		Fugitive emissions from the ships used to transport CO2 to the injection site.		CO2,
1 C 1 c	Other (please specify)		Fugitive emissions from other systems used to transport CO2 to the injection site and temporary storage		CO2,
1 C 2	Injection and Storage	and	<u>Fugitive emissions from activities and equipment at the injection site and those from the end containment once the CO2 is placed in storage.</u>		CO2,
1 C 2 a	Injection		Fugitive emissions from activities and equipment at the injection site.		CO2,
1 C 2 b	Storage		Fugitive emissions from the end equipment once the CO2 is placed in storage.		CO2,
1 C 3	Other		Any other emissions from CCS not reported elsewhere.		CO2,

CO2 Capture in IPCC GHG Inventories Guidelines

[Vol.2] [Chapter 2]

- ▶ With regard to carbon capture, [2.3.4 Carbon dioxide capture] of [Vol.2] [Chapter 2] notes that “Because this is an emerging technology, it requires plant-specific reporting at Tier 3. Plants, with capture and storage will most probably meter the amount of gas removed by the gas stream and transferred to geological storage. Capture efficiencies derived from the measured data can be compared with the values in Table 2.11 as a verification cross-check. Under Tier 3, the CO2 emissions are therefore estimated from the fuel consumption estimated as described in earlier sections of this chapter minus the metered amount removed,” and provides the following Equation 2.7:

TREATMENT OF CO2 CAPTURE

$$\text{Emissions}_s = \text{Production}_s - \text{Capture}_s$$

Where:

- S** = Source category or subcategory where capture takes place
Captures = Amount captured
Productions = Estimated emissions, using these guidelines assuming no capture
Emissionss = Reported emission for the source category or sub-category

CO2 cross-border transport in IPCC GHG Inventories Guidelines

[Vol.2 Energy] [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage]

- ▶ **[5.10 REPORTING AND DOCUMENTATION]** of [Vol.2 Energy] [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage] sets forth treatments in the case of CO2 being transported cross-border for CCS, as follows:

CO2 may be captured in one country, Country A, and exported for storage in a different country, Country B.

Under this scenario, Country A should report the amount of CO2 captured, any emissions from transport and/or temporary storage that takes place in Country A, and the amount of CO2 exported to Country B.

Country B should report the amount of CO2 imported, any emissions from transport and/or temporary storage (that takes place in Country B), and any emissions from injection and geological storage sites.

CO2 cross-border storage in IPCC GHG Inventories Guidelines

[Vol.2 Energy] [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage]

- ▶ **[5.10 REPORTING AND DOCUMENTATION]** of **[Vol.2 Energy] [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage]** sets forth treatments of CO2 cross-border storage and leakage as follows:

If CO2 is injected in one country, Country A, and travels from the storage site and leaks in a different country, Country B, Country A is responsible for reporting the emissions from the geological storage site. If such leakage is anticipated based on site characterization and modelling, Country A should make an arrangement with Country B to ensure that appropriate standards for long-term storage and monitoring and/or estimation of emissions are applied (relevant regulatory bodies may have existing arrangements to address cross-border issues with regard to groundwater protection and/or oil and gas recovery).

If more than one country utilizes a common storage site, the country where the geological storage takes place is responsible for reporting emissions from that site. If the emissions occur outside of that country, they are still responsible for reporting those emissions as described above. In the case where a storage site occurs in more than one country, the countries concerned should make an arrangement whereby each reports an agreed fraction of the total emissions.

CO2 import and export in IPCC GHG Inventories Guidelines

[Vol.2 Energy] [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage]

- From the viewpoint of quality assurance and quality control of GHG Inventory, 「5.9 INVENTORY QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)」 of 「Vol.2 Energy」 [Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage] states as follows:

Ideally, $(\text{Capture} + \text{Imports}) = (\text{Injection} + \text{Exports} + \text{Leakage})$

If $(\text{Capture} + \text{Imports}) < (\text{Injection} + \text{Exports} + \text{Leakage})$ then there is need to check that:

Exports are not overestimated

Imports are not underestimated

Data for CO2 injection does not include EOR operations not associated with storage

If $(\text{Capture} + \text{Imports}) > (\text{Injection} + \text{Exports} + \text{Leakage})$ then need to check that:

Exports are not underestimated

Imports are not overestimated

CO2 capture designated as 'for long-term storage' is actually going to other short-term emissive uses (e.g., products, EOR without storage)



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