



Greenhouse gas Inventory Office of JAPAN

Greenhouse Gas Inventory Office of Japan

温室効果ガスインベントリオフィス



National Institute for Environmental Studies
Earth System Division



Center for Global Environmental Research

Objective of Establishing GIO

The Greenhouse Gas Inventory Office of Japan (GIO) was established in July 2002 at the Center for Global Environmental Research (CGER), the National Institute for Environmental Studies (NIES) for the purpose of compiling annual greenhouse gas (GHG) inventories, to conduct related research, and to execute related tasks such as international correspondence.

Main tasks of GIO

- [Domestic activities]
 - Preparing annual national GHG inventory
 - Providing support and assistance for the technical review of the national GHG inventory of Japan
 - Providing support and assistance for inventory related political actions such as the Committee for the GHG Emissions Estimation Methods
- [International activities]
 - Convening the Workshop on GHG Inventories in Asia (WGIA)
 - Contributing to the technical review of national GHG inventories of other Parties

What is a GHG Inventory ?

An emission inventory is an accounting of the amount of emissions of specific substances (such as air polluting substances and harmful chemicals) during a certain period of time. A greenhouse gas (GHG) inventory is such an emission inventory. It reports the amount of emissions and removals of GHGs that cause global warming such as carbon dioxide (CO₂), by sources and sinks.

In GHG inventories, the emissions of each gas are calculated for each sector and category (see Table 1), based on statistics rather than actual measurement data, as shown in Figure 2. These estimates are summarized in the Common Reporting Tables (CRT), which, together with emission estimates and estimation methods documented in the National GHG Inventory Document (NID), will constitute the official national GHG inventory.

Under the Paris Agreement, all parties shall periodically compile and submit national GHG inventories to the United Nations (UN).

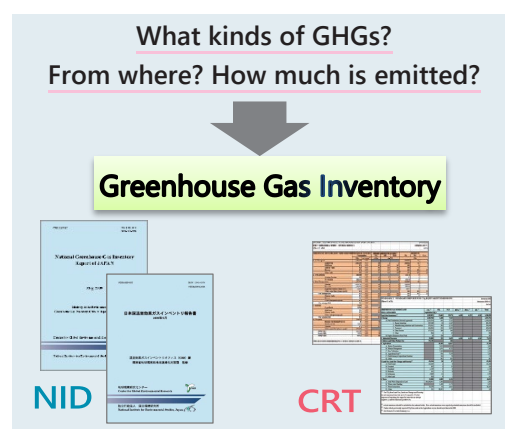


Figure 1: Image of Greenhouse Gas Inventory

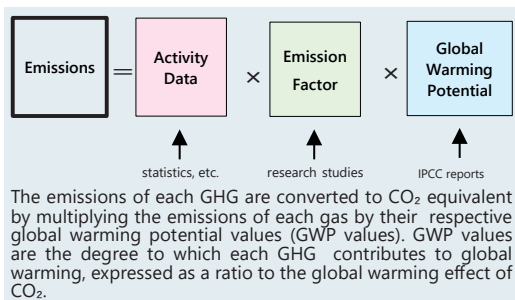


Figure 2: General estimation method

Table 1: Main GHG emission sources / removal sinks

GHG Sector	Carbon dioxide CO ₂	Methane CH ₄	Nitrous oxide N ₂ O	F-gases* ³
Energy	Fuel combustion	Fugitive emissions from fuel, Fuel combustion	Fuel combustion, Fugitive emissions from fuel	
IPPU* ¹	Cement production, Lime production	Chemical industry, Metal industry	Chemical industry, Semiconductor/ Liquid crystal manufacturing	Refrigeration, Air conditioning equipment, Foam blowing, Semiconductor/ Liquid crystal manufacturing, Solvents
Agriculture	Liming, Urea application	Rice cultivation (paddy fields), Enteric fermentation of livestock, Manure management	Agricultural soils, Manure management	
LULUCF* ²	Removals by biomass growth in forests	Emissions from organic soils	Emissions from N mineralization associated with loss of soil organic matter	
Waste	Waste incineration	Solid waste disposal, Wastewater treatment, Composting, Waste incineration	Wastewater treatment, Waste incineration, Composting	

*1: Industrial processes and product use

*2: Land use, land-use change and forestry

*3: Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur hexafluoride (SF₆), Nitrogen trifluoride (NF₃)

Institutional arrangement for the GHG Inventory preparation

Japan has in place institutional arrangements under which the Ministry of the Environment (MOE) acts as the single national entity with overall responsibility for the preparation, approval, and annual submission of the GHG inventory. GIO performs the actual work of inventory compilation, including calculations, editing, preparation of part of the activity data (AD), and the archiving and management of all inventory data. Relevant ministries/agencies provide the AD and emission factors required for preparing the inventory.

The “Trend in Japan’s Greenhouse Gas Emissions” shown below is taken from materials published domestically in conjunction with the submission of the GHG inventory to the UN.

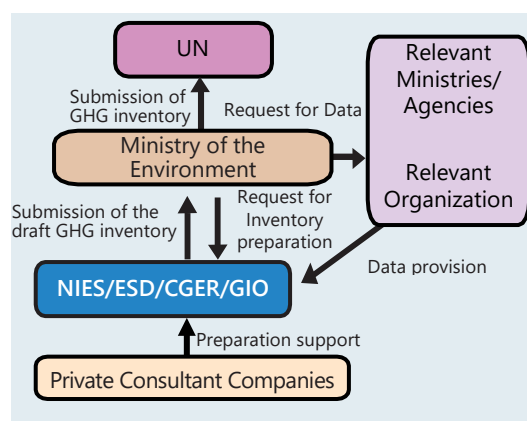


Figure 3: Japan's institutional arrangement for the national GHG inventory preparation

Trend in Japan's Greenhouse Gas Emissions

Japan's GHG emissions and removals in fiscal year* (FY) 2024 were 994 million tonnes of carbon dioxide equivalents (Mt CO₂ eq.). (Emissions: 1,046 Mt CO₂ eq. (Figure 4), Removals: 52.3 Mt CO₂ eq.)

The emissions decreased by 1.9% (20.3 Mt CO₂ eq.) compared to FY2023. The main factors for the decrease are reduced energy consumption due to reduced production in the manufacturing industries sub-sector and the decrease in CO₂ emissions from electricity production due to the wider use of decarbonized electricity (resumption of nuclear power plant operations and wider adoption of renewable energy).

The emissions decreased by 24.9% (347.1 Mt CO₂ eq.) compared to FY2013. The main factors for the decrease are reduced energy consumption (improved energy conservation, etc.) and the decrease in CO₂ emissions from electricity production due to the wider use of decarbonized electricity.

Additionally, the emissions of hydrofluorocarbons, which had been increasing every year from 2005 to 2021, decreased for the third consecutive year.

*Japan's fiscal year runs from April 1 to March 31.

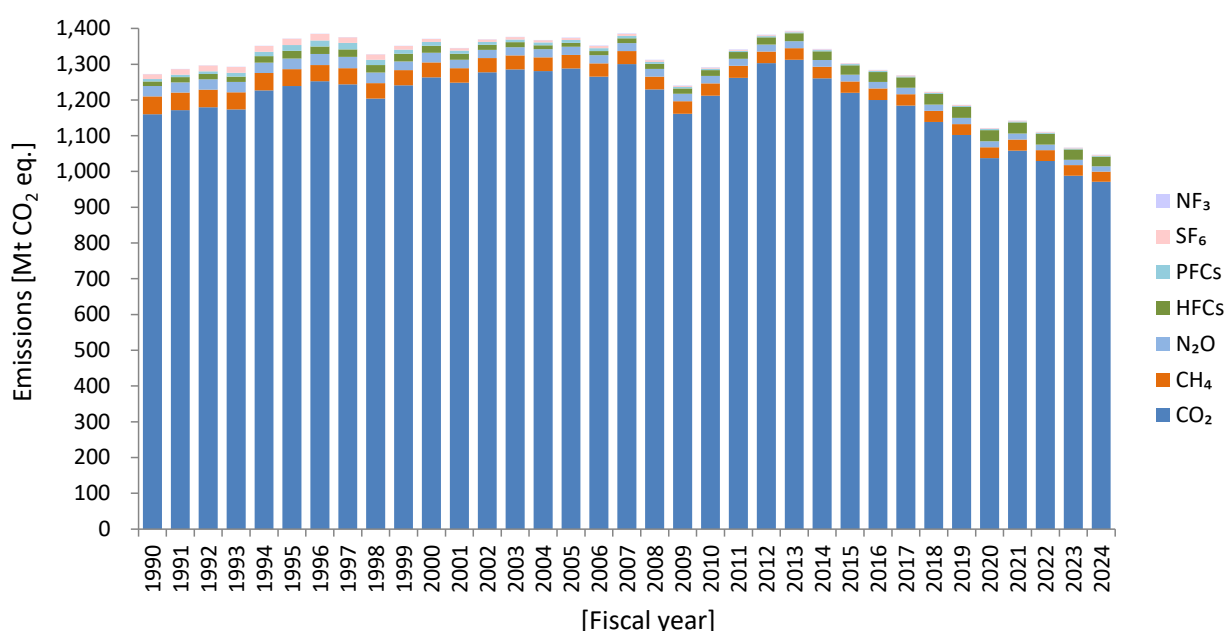


Figure 4: Trends in GHG emissions (FY1990 to FY2024)

International Cooperation and Supporting Activities of GIO (WGIA)

Since 2003, the Ministry of the Environment of Japan and GIO have organized the Workshop on Green-house Gas Inventories in Asia (WGIA) to improve GHG inventories in Asia.



WGIA23 (3-8 August 2026,
in Bandar Seri Begawan, Brunei)



The Report published
as a CGER-REPORT

Activity History of GIO

July,	2002	Establishment of Greenhouse Gas Inventory Office of Japan/ CGER/ NIES
August,	2002	Submitted National Greenhouse Gas Inventories (Submitted every year since 2002)
November,	2003	Convened First Workshop on GHG Inventories in Asia Region (WGIA1), Phuket, Thailand
February,	2005	Convened Second Workshop on GHG Inventories in Asia Region (WGIA2), Shanghai, China
February,	2006	Convened the 3rd Workshop on GHG Inventories in Asia Region (WGIA3), Manila, Philippines
August,	2006	Submitted the Initial Report under Article 7.4 of the Kyoto Protocol to the UN
February,	2007	Contributed to the In-country Review of the Initial Report under the Kyoto Protocol and 2006 Inventory Submission of Japan Organized by the UN
February,	2007	Convened the 4th Workshop on GHG Inventories in Asia (WGIA4), Jakarta, Indonesia
September,	2007	Convened the 5th Workshop on GHG Inventories in Asia (WGIA5), Kuala Lumpur, Malaysia
July,	2008	Convened the 6th Workshop on GHG Inventories in Asia (WGIA6), Tsukuba, Japan (NIES)
July,	2008	Convened the "Open Symposium on the Estimation of the Greenhouse Gas (GHG) Emissions - How to Estimate the Emissions in the Commitment Period" Tokyo, Japan
October,	2008	Convened the Korea and Japan Joint Workshop on GHGs Management, Seoul, Republic of Korea
July,	2009	Convened the 7th Workshop on GHG Inventories in Asia (WGIA7), Seoul, Korea
July,	2009	Convened the 8th Workshop on GHG Inventories in Asia (WGIA8), Vientiane, Lao P.D.R.
November,	2010	Convened the Korea and Japan GHG Inventory Meeting, Seoul, Korea
July,	2011	Convened the 9th Workshop on GHG Inventories in Asia (WGIA9), Phnom Penh, Cambodia
July,	2012	Convened the 10th Workshop on GHG Inventories in Asia (WGIA10), Hanoi, Vietnam
July,	2013	Convened the 11th Workshop on GHG Inventories in Asia (WGIA11), Tsukuba, Japan
August,	2014	Convened the 12th Workshop on GHG Inventories in Asia (WGIA12), Bangkok, Thailand
August,	2015	Convened the 13th Workshop on GHG Inventories in Asia (WGIA13), Bali, Indonesia
July,	2016	Convened the 14th Workshop on GHG Inventories in Asia (WGIA14), Ulaanbaatar, Mongolia
July,	2017	Convened the 15th Workshop on GHG Inventories in Asia (WGIA15), Nay Pyi Taw, Myanmar
July,	2018	Convened the 16th Workshop on GHG Inventories in Asia (WGIA16), New Delhi, India
July,	2019	Convened the 17th Workshop on GHG Inventories in Asia (WGIA17), Singapore
July,	2020	Convened the Mutual Learning on GHG Inventories in 2020, online
July,	2021	Convened the 18th Workshop on GHG Inventories in Asia (WGIA18), online
July,	2022	Convened the 19th Workshop on GHG Inventories in Asia (WGIA19), online
June,	2023	Convened the 20th Workshop on GHG Inventories in Asia (WGIA20), Tomakomai, Japan
July,	2024	Convened the 21st Workshop on GHG Inventories in Asia (WGIA21), Putrajaya, Malaysia
July,	2025	Convened the 22nd Workshop on GHG Inventories in Asia (WGIA22), Phnom Penh, Cambodia
April,	2026	Submitted National GHG Inventories (FY1990 to FY2024) to the UN
August,	2026	Convened the 23rd Workshop on GHG Inventories in Asia (WGIA23), Bandar Seri Begawan, Brunei

Contact us•Website

Greenhouse Gas Inventory Office of JAPAN (GIO)
Center for Global Environmental Research (CGER)
Earth System Division (ESD)
National Institute for Environmental Studies (NIES)

16-2 Onogawa Tsukuba, Ibaraki, 305-8506 JAPAN
E-mail: www-gio@nies.go.jp
Website: <https://www.nies.go.jp/gio/en/index.html>

