



Greenhouse Gas Data Overview

OAR Briefing
February 4, 2024



Outline

- GHG Data Overview
- Greenhouse Gas Inventory (GHGI)
 - Uses of Data
 - Annual Process
 - Preliminary Findings from Draft 2025 GHG Inventory
- Greenhouse Gas Reporting Program (GHGRP)
 - Annual Process
 - Uses of Data
- 2025 Upcoming Actions



Long-standing Comprehensive Data

- EPA has been providing publicly available greenhouse gas (GHG) data since the early 1990s
- EPA implements GHG data collection and publication programs at the national, state and facility level
 - *Inventory of U.S. GHG Inventory Emissions and Sinks Report (GHGI)*
 - State-level GHG inventories and Facility reports
 - Facility-level Greenhouse Gas Reporting Program (GHGRP)

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We have been collecting data for a long time. States were trying to do this at a granular level. We required industry facility level reporting. We have made improvements over the years by expanding and creating a detailed dataset that is made public. It is used by industry, nonprofits, inform CAA policy.

We have improved GHGI by incorporating improved GHGRP data over time. We work each year to continually improve the inventory across sectors, incorporating new data, including GHGRP data and recalculating the time series.

In the early 2000s States and NGOs were developing or had implemented facility-level GHG reporting, but inconsistently and without any federal leadership



Widely-Used Reliable Data

- The programs work together to provide transparent, consistent, high quality greenhouse gas data for the U.S.
- Data are used by a diverse set of stakeholders, including states, industry, other federal agencies, researchers, and the general public.
- Data are used for a wide range of purposes, such as informing state and local policies, regulatory analysis, voluntary programs, corporate benchmarking, and trade policy



Ensuring High Quality Data

- The U.S. is the **global leader** in rigorous and transparent GHG data
- GHGRP is considered the **"gold standard"** for mandatory reporting programs
- EPA methodologies and emission factors are used by other countries
- EPA uses the **international standards development** process to ensure that other countries can be held accountable to report data that is comparable to U.S. data quality
- US experts have played a key role in the **development of rigorous international standards** based on peer-reviewed research
- U.S. experts engage in review and assessment of GHG data published by other countries to ensure they are transparent and complete (e.g., European Union, China)
- U.S. experts have historically provided targeted technical assistance to emerging economies (e.g., South Africa, India) to help them improve the transparency and accuracy of their estimates, which makes them more comparable to U.S. estimates



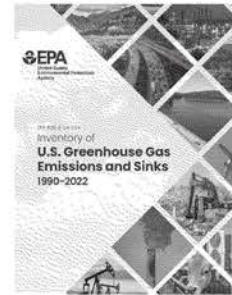
Publicly Available and Accessible Data

Resource	Best for...	Links
National GHG Inventory Report	Understanding historic and current national-level GHG trends by gas, source, and sector	Report/detailed data https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks Interactive data query tool (download charts, data) https://cfpub.epa.gov/ghgdata/inventoryexplorer/
GHGI Inventory by State	Viewing comprehensive state-by state GHG data and information on methods used to disaggregate national GHGI	Report/detailed data https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals Interactive data query tool (download charts, data) https://cfpub.epa.gov/ghgdata/inventoryexplorer/
Facility-Level Information on GHG Tool (FLIGHT)	Viewing all facility and supplier data reported to EPA through a user-friendly, interactive map-based tool	https://ghgdata.epa.gov/ghgp/main.do
Find and Use GHGRP Data	Navigating all GHGRP products (including tools, summaries, downloads) through an interactive one-stop shop	www.epa.gov/ghgreporting/find-and-use-ghgrp-data



GHG Inventory (GHGI) Background

- GHGI is a comprehensive accounting of all U.S. GHG anthropogenic emissions and sinks over time by gas, source, and economic sector
 - Covers all GHGs: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and NF₃
 - Time series (e.g., annual data from 1990-2023 in next publication)
- EPA leads the interagency effort to compile the inventory, coordinating with USDA, USFS, DOE/EIA, DOT/FAA, DOD, USGS and NOAA.
- EPA initiated its first national GHG inventory in 1993 and has published this report annually since then.



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Each year, since 1993, EPA prepares an annual report, the Inventory of U.S. Greenhouse Gas Emissions and Sinks (Inventory), which provides data on current and historical annual GHG emissions and removals by source, economic sector and gas.

The report provides annual emissions back to 1990, so this next report will provide emissions from 1990-2020.

This report is prepared on behalf of US Government, it is impartial and policy neutral.

It fulfills our commitment under UN Framework Convention on Climate Change.



Uses of GHGI Data

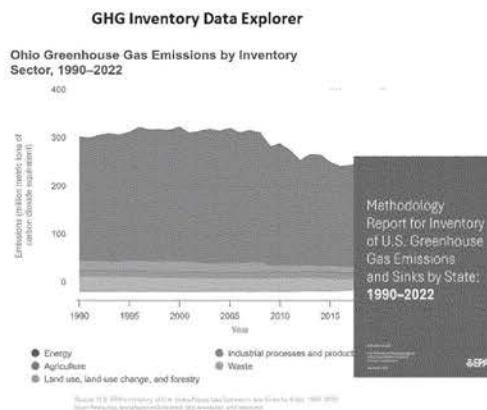
- National inventory data is widely used by a diverse set of stakeholders for many different purposes, including:
 - Developing state and local air emissions inventories and analyzing co-benefits
 - Evaluating GHG intensities of trade-intensive sectors
 - Informing regulatory analysis
 - Using inventory data for benchmarking/comparisons (e.g., industry organizations (America Chamber of Commerce), utilities (Florida Gas Utility))
 - Calibrating economic modeling (e.g., other federal agencies, investment firms (e.g., Morgan Stanley))
- EPA submits the national inventory annually to the United Nations Framework Convention on Climate Change (UNFCCC) as ratified by Congress



State GHG Inventory Data

State-level GHG data fully disaggregating national GHG Inventory

- Consistent with the national GHGI across the time series
- Updated annually August/September
- Publication via EPA GHG Data Explorer
- Peer reviewed methods
- Wide use
 - Data referenced by over 35 states in state inventories
 - Analysis by organizations representing states (e.g., AAPCA State Air Trends and Success Report)



<https://cfpub.epa.gov/ghgdata/inventoryexplorer/>



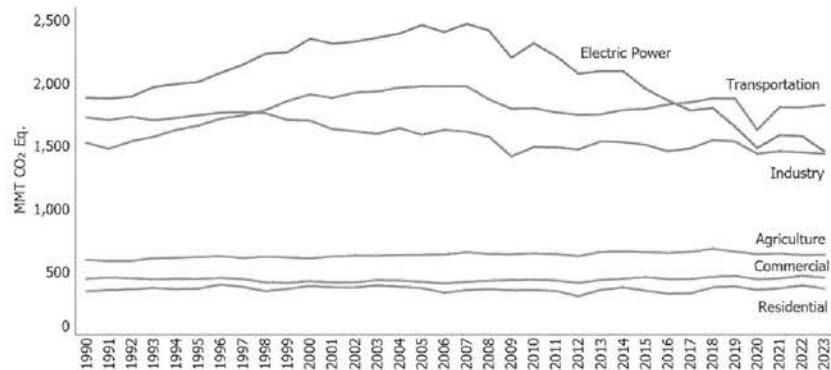
Annual GHGI Compilation Process

Timing	Milestone
July	Interagency meeting to kick-off each cycle, discuss schedule, and improvements
August-September	Work to compile initial estimates, recalculation of time series for improvements
October-November	Expert review of draft estimates to get objective review and feedback from technical experts not involved in compiling estimates
January-March	Public review of draft
Mid-April	Publish and submit final report
May-June	Compile initial state-level GHGI
July-August	Expert review of draft state-level GHG
August-September	Publish updated state-level GHG inventory



Draft GHGI - Trends by Economic Sector

Net emissions, accounting for sequestration, decreased 3.3% in 2023 and decreased by almost 20% over the last 20 years.



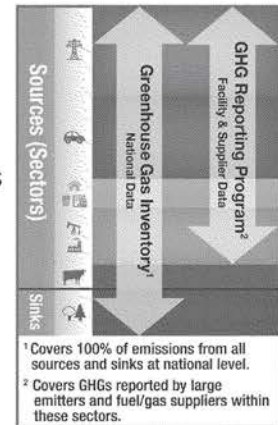
In 2023, Transportation Sector (~29%) remains largest sector, followed by Electric Power and Industry (both 23%), Agriculture (~10%), Commercial (~7%), and Residential Sectors (~6%). All sectors

Note: the figure excludes the Land Use, Land Use Change and Forestry (LULUCF) sector



Relationship between GHGI and GHGRP

- GHGI provides official information on annual U.S. emissions across all sectors of the economy compiled with collaboration across USG
- GHGRP is a regulatory program that collects detailed emissions data from large GHG emitting facilities and suppliers in the United States
 - GHGRP covers most (**but not all**) U.S. GHG emissions
 - GHGRP does **not** include agriculture, land use, and small sources
- GHGRP data is a key annual input to the GHGI across energy, industrial and waste sectors and facilitates a range of improvements



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GHGRP is a key resource for the GHGI, has facilitated improvements and supported additional QA/QC. The GHGRP provides emissions information, activity data, data to derive country-specific/region specific/technology-specific EFs to the GHGI.



GHG Reporting Program (GHGRP) Background

- **Dec 26, 2007:** Congress directed EPA to create a rule to “require mandatory reporting of GHG emissions above appropriate thresholds in all sectors of the economy of the United States ” (H.R.2764/PL-110-161)
- **Oct 30 2009:** EPA finalized the annual GHGRP:
 - Applies to large (>25,000 tons CO₂eq per year) industrial sources (~8,000 facilities) across 46 source categories that report each year
 - Facilities report directly to EPA electronically via EPA’s GHG Reporting Tool (e-GGRT)
 - Transparency of data and sound methodologies are essential elements of the program
 - Over 12 years of published data showing industry trends in reducing GHG emissions
- EPA has promulgated several updates and technical correction rulemakings since 2009.
 - The National Waste and Recycling Association (NWRA) submitted petitions for reconsideration and judicial review on the most recent rulemaking, finalized in March 2024. EPA granted reconsideration in August 2024 and will be expected to take action in Summer 2025.

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25,000 metric tons is equivalent to the emissions from approximately 5,000 average passenger vehicles driven in an year or from combusting 139 rail cars of coal



Annual GHGRP Reporting & Verification Process

Timing	Milestone
Dec 31st	End of reporting year
January	EPA prepares for reporting season (annual form and help content updates)
February	EPA opens electronic system for reporting by industry EPA hosts webinars on how to report
March 31st	Regulatory reporting deadline
April-August	EPA verifies data, contacts reporters about potential errors Industry resubmits data, as needed
Mid-August	Annual and prior year data frozen (no more changes)
September	Final development and polishing of GHGRP data products with frozen data
October	EPA publishes GHGRP data for prior year
November	EPA hosts webinars on finding and using GHGRP data



Uses of GHGRP Data

- GHGRP data is published across a wide number of pages and data formats to meet different public needs
- GHGRP data is used by many States, e.g.:
 - Iowa for annual GHG report to General Assembly
 - Helps meet reporting requirements for state reporting programs (e.g., WA, CO)
- Leveraged by other EPA programs
 - 2020 American Innovation and Manufacturing (AIM) Act HFC Phasedown
 - oil and gas regulations
 - landfill regulations
 - partnership programs
- Relied upon by other federal agencies, e.g.,
 - Department of Treasury tax credits for CCS (45Q)
 - Used to evaluate sector-based carbon intensities such as iron & steel tariffs





2025 Upcoming Actions

Data	Milestone	Projected Schedule
GHGRP	Begin RY24 Reporting	February 2025
GHGRP	Annual "how-to" reporting webinars	February - March 2025
GHGI	Currently adding material to the Public Review (PR) docket	Open until March 17, 2025
GHGRP	RY2024 Reporting Deadline	March 31st, 2025
GHGI	Preview Final GHGI Report – OAR briefings	Late March/Early April 2025
GHGI	Publish Final GHGI, submit to UN	April 10, 2025 (Thursday, earliest)
GHGRP	Take action on request for reconsideration	Summer 2025
GHGI	Publish GHGI by State	August 2025
GHGRP	Publish RY2024 Data	October 2025

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Appendix



Source Categories Covered by GHGRP

Power	Refining & Petrochem	Other Chemicals	Combustion	Waste	Metals	Minerals	Pulp & Paper	High GWP Gases
- D, Electricity Generation* - SS, Electrical Equipment Mfg. - DD, Electrical Equipment Use	- Y, Petroleum Refineries* - X, Petrochem. Production* - WW, Coke Calciners	- E, Adipic Acid* - G, Ammonia* - XX, Calcium Carbide - P, Hydrogen Production - V, Nitric Acid* - Z, Phosphoric Acid* - EE, Titanium Dioxide* - YY, Caprolactam, Glyoxal and Glyoxylic Acid	- C, Stationary Combustion	- TT, Industrial Waste Landfills - II, Industrial Wastewater Treatment - HH, Municipal Solid Waste Landfills	- F, Aluminum* - K, Ferroalloy - Q, Iron & Steel - R, Lead - T, Magnesium - BB, Silicon Carbide* - GG, Zinc	- H, Cement* - N, Glass - S, Lime* - U, Misc. Carbonate Use - CC, Soda Ash* - ZZ, Ceramics	- AA, Pulp & Paper	- I, Electronics Mfg. - L, Fluorinated GHG Production - O, HFC-22 Prod./HFC-23 Destruction* - QQ, Pre-Charged Equipment Import/Export - OO, Industrial Gas Suppliers
Oil & Gas			Fuel Suppliers			Carbon Capture & Sequestration		Mining
- W, Petroleum and Natural Gas Systems			- LL, Coal-Based Liquid Fuels Suppliers - NN, Natural Gas and Natural Gas Liquids Suppliers - MM, Petroleum Product Suppliers			- RR, Geologic Sequestration of CO₂ - VV, Geologic Sequestration of CO₂ with EOR - UU, Injection of CO₂ - PP, CO₂ Suppliers		- FF, Underground Coal Mines
*No reporting threshold - "All-In" sources								Direct Emitters Suppliers CO ₂ Injection