

Purpose and Uses of the National GHG Inventory

Overview

EPA's *Inventory of U.S. Greenhouse Gas (GHG) Emissions and Sinks (Inventory)* is the primary mechanism for demonstrating that the United States is a world leader in reducing greenhouse gas emissions while growing the economy. EPA has been compiling the Inventory on behalf of the federal government, and in cooperation with other federal agencies, since 1993.

The *Inventory* is widely used across the federal government, industry, state agencies and other organizations. EPA spends approximately \$1.5 million per year to publish the National and State Inventories as a transparent, trusted sources of data. If EPA were to discontinue publishing these Inventories, other entities such as the Environmental Defense Fund, the Rhodium Group, or the World Resources Institute would likely publish alternative estimates that would not have the same level of transparency, peer review, stakeholder inclusion, or documentation. Further, it is likely industry stakeholders such as API, AGA, the American Iron and Steel Association, and the American Farm Bureau would raise concerns if EPA were to discontinue publication of the *Inventory*. Industry views EPA's *Inventory* data as an unbiased source that demonstrates their emission reductions over time (see Appendix B). Furthermore, since States rely on *Inventory* data to meet state-legislated greenhouse gas inventories (e.g., Iowa, Nevada), it is likely that in the absence of a standardized national approach, States would use inconsistent approaches to developing inventories (see Appendix C) leading to challenges for States in comparing data and understanding the impacts of policy and programmatic efforts. Differences in methodological and accounting approaches by States inevitably lead to double-counting and gaps in emissions estimation, particularly with respect to mobile sources and fugitive methane emissions.

The draft 2025 *Inventory* shows that net total emissions have declined 20% over the last 20 years while the economy has grown 41 percent. Over that same period, U.S. energy-related emissions decreased 21%, while energy production increased 53 percent. The rigor and transparency of the *Inventory* has made it possible for the U.S. to pressure trade competitors such as China, India and Brazil to disclose their emissions and ensure valid comparisons of performance across countries. Without the U.S. example, trade competitors would likely backslide on their obligations, and international comparisons would have to rely on lower quality United Nations (International Energy Agency) data for carbon dioxide emissions, and simplified global averages for non-CO₂ emissions that do not reflect U.S. achievements in reducing emissions.

Uses of the *Inventory*

- Statutory obligations
 - The *Inventory* satisfies the U.S. legal obligation for Parties to the UNFCCC Treaty (ratified by the Senate in 1992) to submit and update national greenhouse gas inventories.
- Rulemakings/Regulatory Analysis
 - The *Inventory* supports Clean Air Act rulemaking analyses by providing robust national level emissions data for contextualizing the size and impact of emissions from various economic sectors. In the absence of the *Inventory*, EPA would not have a reliable, widely-accepted data source for characterizing economy-wide U.S. greenhouse gas emissions and sinks to determine whether emission sources meet significance thresholds (e.g., for NSPS

categories). Stakeholders disagreeing with EPA GHG related rulemaking proposals would likely claim weaknesses in the GHG data foundation as part of their public comments.

- IRS's 45Y/48E tax credit final rule¹ explicitly cites the use of the *Inventory* power sector data as the metric for triggering the eventual phase-out of tax credits (when emissions from the power sector are equal to or less than 25 percent of 2022 levels).
- Economic modeling
 - *Inventory* data is used to calibrate a large number and variety of EPA and open-source economic models. EPA examples include the Non-CO₂ GHG Projections and Mitigation Cost Models and the Vintaging Model, all of which are used to support the development of EPA technical reports and EPA rulemakings, while the non-CO₂ models provide important data sets used in many open-source economic models. Open-source examples include energy-economic models (e.g., Pacific Northwest National Lab's Global Change Analysis Model (GCAM) and Purdue University's Global Trade Analysis Project (GTAP)) and lifecycle models, (e.g., Argonne National Laboratory's Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) model), which are used to support EPA rulemakings and IRS tax credits. In the absence of *Inventory* data, models would use a wide range of alternative sources, some of which are proprietary and less reliable in terms of frequency of publication (so also potentially dated), or less transparent on how they are compiled. The outcome would be a lack of comparability, interpretability, and confidence in results.
 - OAQPS's emissions modeling platform (2022v1 Platform) relies on *Inventory* livestock data and supports states in emissions modeling to conduct NAAQS SIP modeling (i.e., ozone, PM_{2.5}). The modeling platform relies on this data from the *Inventory* because it is comprehensive and complete time series data. Estimation of accurate emissions from livestock management requires detailed characterization of livestock population and is compiled regularly for the *Inventory* using USDA's annual statistics in combination with other process/growth models.
- Trade and Exports
 - *Inventory* data often can be used to show that U.S. manufacturing² is more efficient than production in other countries. Without the inventory data, countries validating U.S. manufacturer claims on carbon intensities (e.g., for carbon border adjustment mechanisms (CBAM) would likely rely on estimates such as those from the International Energy Agency (IEA), which could disadvantage U.S. industries.
 - DOE has used the *Inventory* for verifying the emission intensity of LNG exports, which may be used to help demonstrate the low methane emissions rates required by the EU Methane Regulations.³ Under these regulations, if national-level UNFCCC inventory data are unavailable, it may be more difficult to exempt U.S. companies from requirements to quantify supply chain emissions. Additionally, the lack of data may make U.S. LNG less

¹ Federal Register Volume 90, Issue 9 (January 15, 2025), <https://www.govinfo.gov/content/pkg/FR-2025-01-15/pdf/2025-00196.pdf>

² For example, see the U.S. International Trade Commission emission intensities for steel and aluminum. [HYPERLINK "https://www.usitc.gov/publications/332/pub5584_0.pdf"]

³. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202401787&pk_campaign=todays_OJ&pk_source=EURLEX&pk_medium=X&pk_keyword=energy_sector&pk_content=Regulation&pk_cid=EURLEX_todaysOJ

attractive in other import markets (e.g., Japan) where emissions intensity is an important attribute.

- Benchmarking
 - DOE technology development programs focused on lowering production costs for American farmers use *Inventory* data as the only available source of comprehensive data to benchmark for current levels of carbon stored in soils for calibrating soil carbon sensors.
 - The U.S. Bureau of Economic Analysis (BEA) reports data under the OECD's System of Environmental-Economic Accounting (SEEA) based on the *Inventory*. There are over 90 countries that report this data, including most OECD countries. Without the *Inventory* there would be no reliable way to produce the data for the U.S. This reporting demonstrates how the U.S. has outperformed OECD in terms of emissions reductions using internationally harmonized methodologies and definitions. While this has no direct impact on private U.S. companies, it does provide consistent and comparable data that could be used for issues such as risk management, investment, supply chain management and compliance with regulations.
- Other Reporting
 - EIA's Annual Energy Outlook incorporates *Inventory* data into emissions projections; without EPA factors the emission projections would be less accurate.
 - USDA uses the *Inventory* in several ways. Without EPA inventory data, it would be harder for farmers, ranchers, and landowners to demonstrate the environmental and economic benefits of their operations. As a result, it could result in lower market value for their products and land as well as limit their ability to participate in emerging environmental service markets.
 - USDA uses *Inventory* data as a metric to track the adoption/effects of Natural Resources Conservation Service (NRCS) conservation programs authorized under the *Farm Bill* and consistent with the *Food, Conservation, and Energy Act of 2008* directing USDA to measure environmental service benefits from conservation and land management activities that facilitate the participation of farmers, ranchers, and landowners in emerging environmental services markets.
 - USDA uses *Inventory* data, methods and models in the Entity-Scale Methods Report required under Section 2709 of the *Food, Conservation, and Energy Act of 2008*. This report serves as the basis for the NRCS COMET-Farm decision-support tool allowing farmers to identify inefficiencies in their farming practices, such as overuse of fertilizers or energy, and adopt more efficient management practices that can reduce costs, improve soil health, raise crop yields, and increase drought resilience.
 - USDA uses *Inventory* data, methods and models in the analyses that facilitates participation of farmers in biofuel markets, consistent with *E.O.s 14154 and 14156*. The *Inventory* provided the data necessary for USDA's January 2025 interim rule on Technical Guidelines for Climate-Smart Agriculture Crops Used as Biofuel Feedstocks and for the USDA Feedstock Carbon Intensity Calculator, which allows biofuel feedstock producers to determine their eligibility and receive additional market value for low-carbon biofuel feedstocks.
- Organizations that support states, such as the Association of Air Pollution Control Agencies (AAPCA) use the *Inventory* to show progress in reducing emissions in their annual report.

GHGRP and the Inventory

The Inventory provides an aggregate picture of GHG emissions from all sources and sinks for the entire country and makes it possible to understand how U.S. emissions from various sectors are changing over time. The Inventory is also the only tool for making comparisons with other countries. Some Inventory estimates are based on aggregate national statistics (e.g., automobiles), while other estimates draw from information reported by individual facilities (e.g., municipal solid waste landfills).

The Greenhouse Gas Reporting Program (GHGRP), in contrast, receives data from the approximately 8,000 largest emitting facilities in the country, making up just over one-half of total national emissions. GHGRP data are a key input to many estimates in the Inventory, providing higher accuracy and detail needed to track GHG reductions taking place in numerous industry sectors. Without GHGRP data, we would not be able capture these improvements and would both overestimate emissions and understate reductions. In this context, for significant sources⁴ using GHGRP data in the *Inventory*, the range of uncertainty collectively decreased with use of GHGRP data relative to use of pre-GHGRP methods by 60%.

NEI and the Inventory

The GHG Inventory (GHGI) and National Emissions Inventory (NEI) are two distinct air emissions inventories in terms of purpose and scope compiled by EPA's OAR. The GHGI compiles economy-wide greenhouse gas emission and sink data every year, updating time series data starting in 1990, comprehensively covering all GHGs, i.e. CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and NF₃. The GHGI tracks total national emissions and national trends over time and supports statutory obligations as a Party to the UNFCCC.

The NEI is compiled on a 3-year development cycle for a single year. The current NEI is for 2020, with the 2023 NEI currently in development. The NEI compiles emissions of criteria air pollutants (CO, PM, SO_x, NO_x, Pb, etc.), the precursors of criteria air pollutants (e.g., NH₃, VOCs), and hazardous air pollutants (HAPs) submitted by state, local and tribal agencies (SLT) under the Air Emissions Reporting Requirements (AERR) ([HYPERLINK "<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-51/subpart-A>"]). NEI consolidates data collected to support air quality modeling and assessment of statutory goals. See Appendix A for more information.

⁴ Landfills (MSW and industrial), natural gas systems (CH₄ and CO₂), petroleum systems (CH₄ and CO₂), active coal mines (CH₄), cement, ammonia production, and petrochemical production (CO₂).

Appendix A: Differences between the GHG Inventory and National Emissions Inventory (NEI)

The GHG Inventory and NEI are two distinct air emissions inventories in terms of purpose and scope compiled by EPA's OAR. OAP and OAQPS do coordinate and collaborate on data, where applicable.

	National Emissions Inventory (NEI)	GHG Inventory (GHGI)
Scope	The NEI is compiled on a 3-year development cycle for a single year. The current NEI is for 2020, with the 2023 NEI currently in development. The NEI compiles emissions of criteria air pollutants, the precursors of criteria air pollutants, and hazardous air pollutants submitted by state, local and tribal agencies under the Air Emissions Reporting Requirements ([HYPERLINK "https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-51/subpart-A"]). NEI consolidates data collected to support air quality modeling and assessment of statutory goals.	The GHGI compiles economy-wide greenhouse gas emission and sink data every year, updating time series data starting in 1990, comprehensively covering all GHGs, i.e. CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and NF₃. The GHGI tracks total emissions and national trends over time and supports statutory obligations as a Party to the UNFCCC.
Approach	Consolidates data submitted from SLT air agencies from large point sources, non-point sources and event sources consistent with AERR reporting thresholds by pollutant. While consolidated, source data from different SLT agencies may not be consistent or comparable across states for the current NEI or previous NEI year, etc. The NEI is also not recalculated with each subsequent NEI.	Compiled using consistent methods and data for sources across the time series for complete coverage of sources in the U.S., incorporating higher resolution data into methods where available (e.g., use of GHGRP data). The GHG Inventory is also re-evaluated every year so that impacts of updates are recalculated for the entire time series, not just the current year, as applicable.
Website	https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei	https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

Appendix B: Industry Uses of Inventory

- **American Petroleum Institute (API) comment on 2024 GHGI:**
 - “API supports timely and accurate reporting and transparency by the oil and natural gas industry – and all other emitting sectors of GHG emissions – through EPA’s GHG Inventory (GHGI).
 - “The U.S. is leading the world on energy production and emissions reductions, and thanks to industry action, methane emissions have fallen by 37% between 2015 and 2022.” ([HYPERLINK "https://www.api.org/news-policy-and-issues/news/2024/11/12/api-statement-on-final-methane-fee-rule" \l "":~:text=The%20U.S.%20is%20leading%20the,37%25%20between%202015%20and%202022."])
- **American Gas Association (AGA) comment on 2023 GHGI:**
 - “We are pleased to see the Draft Inventory shows methane emissions from natural gas local distribution systems across the country declined by 70 percent from 1990 to 2021. The data reflect the work AGA member gas utilities have been doing to modernize their systems and implement best practices.”
- **American Iron and Steel Institute**
 - “The American steel industry is the cleanest of the leading steel industries in the world. Of the major steel-producing countries, the U.S. has the lowest CO₂ emissions per ton of steel produced.” ([HYPERLINK "https://www.steel.org/wp-content/uploads/2023/06/American-Steel-Carbon-Advantage_-_Final-2023_updated-June-6-2023.pdf"], 2023)
 - “And EPA data indicates that the production of iron, steel and metallurgical coke in the U.S. amounted to less than one percent of national CO₂ emissions, compared to the global scale of total CO₂ emissions from steel —which is nearly seven percent. ([HYPERLINK "https://www.steel.org/wp-content/uploads/2021/03/Sustainability-Key-Messages.pdf"]).”
- **US Chamber of Commerce: Latest EPA GHG Inventory Shows Continued Progress on Emissions Reductions in 2019.** See [HYPERLINK "https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.uschamber.com%2Fregulations%2Flatest-epa-ghg-inventory-shows-continued-progress-emissions-reductions-2019&data=05%7C02%7CDesai.Mausami%40epa.gov%7C4960f060b8ea4145a27708dd57514bed%7C88b378b367484867acf976aacbeca6a7%7C0%7C0%7C638762728851581374%7CUnknown%7CTWFPbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiJlLjAUMDAwMCIslAIiOiJXaW4zMilslkFOljoiTWFpbiClslldUljoyfQ%3D%3D%7C0%7C%7C%7C&sdata=QstVxrEA96QqjfjK%2FibWyl%2B5QE%2FRI2%2BG%2ByCPHxXPmmQ%3D&reserved=0" \h]:
 - Few (if any) countries around the world have been able to reduce emissions while growing their economy as effectively as the United States. In fact, between 2005 and 2019, net economy-wide GHG emissions have fallen by 855 MMT CO₂e—an amount far greater than that of any other country, ever. Moreover, these emissions reductions have occurred alongside a growing economy—a recent break from historical norms. For decades, U.S. GHG emissions tended to rise in concert with population and economic growth, but in the mid-/late-2000s, the trends decoupled. What has driven this decoupling? In two words, natural gas and the shale revolution.”
- **American Farm Bureau Federation (AFBF)**
 - “The latest numbers demonstrate farmers’ and ranchers’ commitment to growing the food and fiber America’s families rely on while improving the land, air and water, a benefit to the farm and

the climate,” said AFBF President Zippy Duvall. “The drop in agricultural emissions highlights the success and importance of voluntary and market-based programs that support farmer efforts in sustainable agriculture practices. The latest numbers should also serve as inspiration to lawmakers who can build on this progress by passing a farm bill, which not only provides a safety net for farmers, but also helps them meet sustainability goals.” [HYPERLINK "https://www.fb.org/news-release/agriculture-emissions-fall-to-lowest-levels-in-10-years" \h]

Appendix C: States with GHG requirements that rely on EPA’s U.S. GHG Inventory.

- **Colorado** Bill 19-096 requires the air quality control commission in the department of public health and environment (department) to develop and publish a statewide GHG inventory at minimum every two years.
- **Iowa** Code 455B 104 requires the Department of Natural Resources to report annual to the governor and general assembly on state-wide greenhouse gas emissions and trends.
- **Pennsylvania** (2008 Act 70) requires Pennsylvania’s Department of Environmental Protection to develop an annual state-wide GHG Inventory.
- Under **Maryland**’s Md. Environment Code Ann. § 2–1203, Department of the Environment is required to publish a statewide GHG emissions inventory every three years beginning 2011. **New Hampshire** relies on and links to EPA GHG Inventory data for state-wide estimates.
- **New Jersey** per EO #54 shall provide on an annual basis a state-wide GHG Inventory.
- **New York** has a statutory requirement to publish an annual report on statewide greenhouse gas emissions, pursuant to Section 75-0105 of the Environmental Conservation Law. GHGRP data are used in developing and updating methodologies, but also annual GHGRP data are used in the reports, such as for aluminum, ferroalloy, iron and steel, lead, cement, semiconductor and other industries.
- **Nevada** NRS 445.389 requires the Department of Conservation and Natural Resources to issue at least every 4 years, a statewide GHG inventory.
- **North Carolina** uses regular statewide inventory to benchmark progress for Session Law (SL) 2021-165 (House Bill 951 (Energy Solutions for North Carolina)).
- **Vermont** has a statutory requirement to publish an annual GHG inventory until 2028 (10 V.S.A. § 582). Vermont’s Department of Environmental Conservation uses GHGRP data for industrial sectors, such as semiconductor manufacturing.
- **Washington** requires a biennial state-wide GHG inventory per RCW 70.235.020(2)