

Understanding the Greenhouse Gas (GHG) Inventory

Key Trends and Actionable Insights

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The U.S. Environmental Protection Agency (EPA) recently published the latest GHG Inventory, which analyzes U.S. emission sources, sinks, and trends of greenhouse gases. Containing 841 pages and 9 annexes filled with valuable information, the GHG Inventory is crucial to nationally tracking the effects of policy and socioeconomic trends on emissions and climate goals. This tracking helps to ensure that the U.S. meets its commitments under the United Nations Framework Convention on Climate Change. To help you better understand the GHG Inventory and its key takeaways, we have summarized some of the large-scale trends from the report and provided some actions that you can take to help reduce GHG emissions and mitigate climate change.

2022 GHG Inventory Highlights

The GHG Inventory describes several large-scale trends:

- Largest GHG Emitting Sectors: The transportation, energy, and industrial sectors stood as the largest emitters in the U.S. economy over the period of 1990–2020.
- Annual Emissions Decreasing Trend: There was

 a 9% decrease in 2020 emissions relative to 2019,
 reflecting the impact of COVID-19 on travel, as well
 as the credit of sustained energy efficiency measures
 and market trends.



- Increase in Wind and Solar Energy Production:
 2020 heralded wind and solar energy production
 levels 100 times greater than 1990 production levels.
- Energy-Efficient Technologies Implementation:
 The widespread implementation of energy-efficient technologies represents industry efforts to improve environmental performance and mirrors consumer trends, such as declining energy use and emissions per capita.³

These trends are not surprising given the societal focus on climate change, but they also provide areas of focus and opportunity for those in the private sector.

Actionable Steps Based on Trends from the GHG Inventory

The GHG Inventory provides enough detail about relevant trends for firms to create opportunities that maximize potential credits and leverage ongoing projects for GHG reductions.

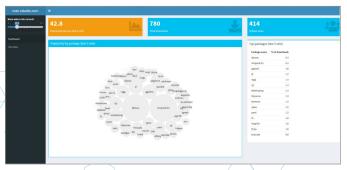
Key Recommended Action #1

Use GHG Inventory metrics as part of Environmental, Social, and Governance (ESG) analytics and reporting to demonstrate the alignment of private sector activities with federal initiatives for reducing GHG emissions.

As environmental reporting gains breadth and depth across the economy, the once-niche trend of tracking environmental and social indicators is evolving from interesting to imperative. Known by many names (e.g., ESG, corporate social responsibility, corporate sustainability), the voluntary reporting system continues to mature into corporate norms and regulations, while distinct reporting guidelines consolidate and align with national and global reporting paradigms.⁴ In March 2022, the Securities and Exchange Commission even proposed climate disclosure rules.⁵

Companies that understand the value of their own information become exceptional. Just as EPA's GHG Inventory paints the big picture for stakeholders, firms that maintain their own inventory of environmental and social metrics see their big picture, and therefore their opportunities, more clearly.

But how? Stakeholders are justifiably wary of firms circumventing reporting with greenwashing, but firms are equally cautious of shifting extensive reporting demands. The solution is to balance contextual relevance with the goals of a firm. The key question is



An example of E\$G reporting analytics dashboards.

whether a firm is making progress on the climate change or GHG reduction goals relevant for ESG areas applicable to its business and its context. Key metrics will vary across sectors. For example, reducing transportation emissions may be an important consideration for grocery stores, whereas implementing energy-efficient technologies may be an important consideration for manufacturers. Evaluations of these metrics within ESG reporting help to tell the complete story of the actions your company is taking, as well as identify additional areas where you can implement GHG reductions to help mitigate climate change.

Key Recommended Action #2

Implement ecological restoration projects to provide immediate impacts to the Land Use, Land-Use Change, and Forestry (LULUCF) category in the GHG Inventory.

The LULUCF category of the GHG Inventory evaluates emissions and removals of CO_2 , and emissions of CH_4 and $\mathrm{N}_2\mathrm{O}$, from land use, land-use change, and forestry. In the GHG Inventory, this is the only category with negative carbon emissions or, in other words, that land-use changes were able to reduce emissions and/or capture and trap carbon from the atmosphere (i.e., carbon sequestration). The GHG Inventory also noted that net capacity for carbon sequestration in natural systems has decreased by almost 10% over the last 30 years, due to drained organic soil in forests, wood stock reduction, agriculture, and land development. This can be off-set by improving forestry practices or by converting or restoring land use to systems with high-carbon storage capacity.

Ecological restoration is emerging as an effective tool to address land-use changes by converting land use from high-emissions uses (e.g., agriculture) to lower-emissions uses (e.g., forests), and by focusing on preserving and restoring natural ecosystems with high-carbon storage capacity (e.g., wetlands, bogs, forests) that can mitigate carbon emissions and enhance ecosystem services. The United Nations Decade on Ecosystem Restoration (2021–2030) has created a window of opportunity to leverage projects, grants, and funding that can maximize the value gained for implementing these types of restoration projects.

However, not all ecological restoration is equal. Well-designed ecological restoration projects can produce multiple benefits simultaneously, including reducing GHG emissions, improving carbon sequestration, providing ecological habitat, increasing resilience of local communities and infrastructure, and providing community recreational opportunities, among others. Coastal wetlands are one such ecosystem that can provide value for carbon sequestration while also providing protection from sea level rise, flooding, and surge-related natural disasters. By considering GHG impacts as part of the ecological restoration design, firms can fully realize all of the potential benefits restoration may provide.



Wetlands may provide high-carbon storage potential to reduce GHGs.

Putting It All Together

The GHG Inventory is a bridge between the science community's research on climate emissions and the wider economy's statistics on the emissions sources underpinning the climate crisis. Actionable steps, like enhanced ESG reporting and targeted restoration projects, can help companies take concrete actions to incorporate GHG reduction and climate change mitigation into their operations, providing additional value to the stakeholders and the global community.

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