

Greenhouse 100 Polluters Index Technical Notes

GHGRP Data

The Greenhouse Gas Reporting Program database (GHGRP), compiled by the U.S. Environmental Protection Agency (EPA) in response to the FY2008 [Consolidated Appropriations Act \(H.R. 2764; Public Law 110--161\)](#), annually reports the weight (in metric tons) of greenhouse gasses from both large direct emission sources and suppliers of fossil fuels. From an EPA [About the Program page](#): "In general, facilities that directly emit 25,000 metric tons of carbon dioxide equivalent or more per year are required to submit annual reports to EPA. In addition, suppliers of certain products that would result in GHG emissions if released, combusted or oxidized are required to report." Data has been reported so far (as of when this report was made) for 2010 through 2021.

Our analysis uses 2021 reports from large direct emission sources (i.e. facilities) from this database. Suppliers were included in PERI's Greenhouse Suppliers 100 list and considered separately, since some suppliers provide fuel to direct emission sources, and combining emitters and suppliers could result in the fuel being counted twice. The GHGRP database provides data on more industrial sectors than previous U.S. facility-specific databases since it covers more than the electricity generation sector -- it also covers petroleum and natural gas systems, refineries (the Greenhouse 100 uses data from them as direct sources of emissions, not as suppliers), chemicals, waste, metals, minerals, and pulp and paper.

We added up direct carbon dioxide emissions plus emissions of methane, nitrous oxide, and fluorinated gasses as carbon dioxide equivalents as reported within the GHGRP database. Biogenic carbon dioxide was not included within these totals. EPA converts other gasses to CO2 equivalents using GWPs from IPCC's AR4, with a 100-year GWP for gasses like methane.

We obtained the GHGRP data from the [Envirofacts Customized Search](#) Summary Subjects on March 2, 2023.

Parent Company Matching

Using information on company ownership of facilities from the GHGRP reports, company websites, the CrocTail database of SEC filings, and news reports, we matched each facility to its parent company. Each facility was assigned either one or two parents as follows:

If more than 50% of a facility was controlled by a single parent, that parent was assumed to have final control over the facility's operations, and was assigned full responsibility for the facility's pollution.

If two companies each controlled 50% of a facility (i.e. it was a 50/50 joint venture), then its pollution was divided between the two companies.

If a single company controlled 50% of a facility and no other single entity controlled the other 50%, that company was considered to be the parent of the facility.

If no parent controlled 50% of a facility, the facility was considered to be its own parent.

The GHGRP database includes detailed ownership percentages of facilities by multiple parents, and we could have used these to assign each facility's pollution to many parents instead of one or two. However, these percentages reported within the GHGRP are [percentages of ownership, not percentages of emissions](#). It is possible for power plants to have multiple generating units owned by different companies in which the percentage of ownership of the facility as a whole does not match the percentage of the facility's emissions from each set of generating units. Therefore, we consider that assigning pollution by corporate majority ownership better reflects the data.

Corporate ownership of facilities was reported to the GHGRP as it was on December 31, 2021. In

some cases we updated parent companies according to mergers, acquisitions, and corporate name changes that took place through mid 2023, under the principle that when one company acquires another, it takes responsibility for that company's past pollution. We also combined some U.S. subsidiaries of common foreign companies together.

The Greenhouse 100 list was created by ranking the 100 largest parent companies for carbon dioxide equivalent emissions (excluding biogenic carbon dioxide) from the [GHGRP database](#) of large fixed facilities, after parent companies were assigned as above. Facilities that were owned 50%/50% by two companies had half of their emissions assigned to each parent.

The Greenhouse 100 list and application lists both parent company carbon dioxide equivalent totals and percentages of the database. The application also shows data from individual facilities owned by each parent company and from industrial sectors at each. For each parent company, the percentage of the company's total emissions that are from a single facility is displayed in the Greenhouse 100 list. This helps to identify companies whose overall emissions are dominated by a single source.

Matches to Other Data

For comparison, the application also shows each parent company's percentage contribution to total U.S. greenhouse gas emissions including all sources, such as transportation, commercial, agricultural and residential emissions, as taken from the 2021 [U.S. Inventory](#). This percentage (of the parent company's emissions compared to all emissions within the U.S.) is listed in the Greenhouse 100 table.

The detailed Greenhouse 100 application shows links to a company's Toxic 100 Air, Toxic 100 Water, and Greenhouse Supplier 100 pages if the company also has data in those databases. Individual facilities displayed in the detailed application have been linked to their Toxic 100 Air data if the same facility is in both datasets. Finally, Greenhouse 100 companies have been linked to data on dollar penalties for each company from Good Jobs First's Violation Tracker and local, state, and Federal subsidies for each company from Good Jobs First's Subsidy Tracker.

EJ Data

For anthropogenic global climate change, the locations of the facilities emitting greenhouse gasses do not matter. But these facilities also commonly emit co-pollutants, such as particulate matter, carbon monoxide, and sulfur oxides, as well as other criteria and toxic air pollutants, that have harmful effects on people living nearby. For this reason we calculated facility locational environmental justice (EJ) ratios by using American Community Survey 2019 5-year average block group data on people living within 10 miles of each facility. The minority EJ ratio is the percentage share of racial and ethnic minorities in the total population living within the 10-mile radius around each facility; in the advanced data display, this is disaggregated into specific minority groups. Similarly, the poverty EJ ratio is the percentage of people living below the poverty line within this radius, and the "near poor" percentage is the percentage of people living up to twice the poverty level.

For EJ ratios for parent companies, we weighted population numbers within a ten mile radius of each facility by multiplying them by the CO2 emissions from that facility, then summed up the weighted numbers for all facilities in the company and divided the poor or minority weighted population sum by the total weighted population sum. This implicitly assumes that the amount of co-pollutants produced by each facility is on average proportional to the amount of CO2 it releases.