Carbon Accounting & Reporting Methodology

Methodology

Goldman Sachs applies greenhouse gas (GHG) inventory accounting principles throughout its methodology that are consistent with The GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol Corporate Standard) developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

Reporting Period

Goldman Sachs reports GHG emissions on a calendar year basis, from January 1 through December 31 of each year.

Organizational Boundary

Goldman Sachs operates a global portfolio of facilities and captures the global portfolio in its GHG inventory. We use the operational control approach to establish the organizational boundary of our GHG and energy reporting. As defined by the GHG Protocol, this includes operations where we have the full authority to introduce and implement operating policies. Under this approach, 100% of our activities (GHG emissions, fuels and energy consumption, and refrigerant usage) from all owned and leased facilities and vehicles globally over which we have operational control are counted.

While Goldman Sachs is the primary occupant of many owned or leased facilities, there are many occurrences where the firm occupies a multi-tenant facility. For multi-tenant buildings, many services, including energy utilities, are shared among tenants, and property managers allocate fees on a percent occupied area basis. This includes full-service gross-leased offices and co-located data centers where the energy and water utilities are paid for by the property manager and/or not specifically metered for the firm's operations. In these situations, primary data is typically unavailable, and the firm's environmental impact is estimated.

Operational Boundary

The Scope 1 and Scope 2 GHG emissions inventory includes direct and indirect energy consumed by Goldman Sach's operationally controlled offices, data centers and vehicles. These energy sources include natural gas, diesel, jet fuel, purchased electricity, chilled water and steam (see Table 1). Goldman Sachs also directly emits HFC emissions from heating, ventilation, and air conditioning (HVAC) systems and chillers.

Goldman Sachs also reports Scope 3 category 6 emissions from business travel. These include those arising from travel (flights, rail and ferries) and ground transportation (car/taxi) used by employees for business purposes as well as hotel accommodation.

The Scope 1, Scope 2 and Scope 3 GHG inventory includes all of the six Kyoto gases, as relevant. Specifically, CO_2, CH_4, and N_2O emissions from electricity and fuel consumption and HFC emissions from refrigerant use. Goldman Sachs does not report emissions of SF_6, PFCs, or NF_3 as no sources within the operational control boundary have been identified to date. The emissions of each GHG (CO_2, CH_4, N_2O, HFC) are converted to CO_2-equivalents (CO_2e) by applying relevant emission factors.

Table 1: GHG Emissions Source Identification

Activity	Source	GHG Emission
Scope 1 – Required Direct Emissions (CO_2e)		
Emergency power generation (i.e.outages)	Diesel	CO_2, CH_4, N_2O
Facility heating & cooling	Natural gas	CO_2, CH_4, N_2O
Fugitive refrigerants	HVAC Units	HFCs
Air travel	Jet fuel	CO_2, CH_4, N_2O
Ground transportation	Vehicle gasoline; vehicle diesel	CO_2, CH_4, N_2O
Scope 2 – Required Indirect Emissions (CO_2e)		
Lighting, HVAC units	Purchased electricity	CO_2, CH_4, N_2O
Space heating	Purchased electricity; purchased steam	CO_2, CH_4, N_2O
Space cooling	Purchased electricity; purchased chilled water	CO_2, CH_4, N_2O
Scope 3 Category 6 – Optional Indirect Emissions (CO_2e)		
Commercial air travel	Commercial flights	CO_2, CH_4, N_2O
Other travel	Road travel; rail travel; ferry; charter jet travel; hotel accommodation	CO_2, CH_4, N_2O

Quantification Methodology & Data Management

All GHG activity data and emissions are tracked through a third party carbon accounting platform, which records global facility utility information. This tool follows guidelines from the GHG Protocol's Corporate Accounting and Reporting Standard, Scope 2 Guidance and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard, as well as other relevant guidance documents from the GHG Protocol. Their methodologies and emission factors undergo updates and third-party reviews that result in a statement of limited assurance twice per year. These updates include incorporating newer emission factors, improving the granularity of measurement approaches, and creating custom methodologies to assist customers with needs outside the standard sector guidance.

For Scope 1, activity data from fuels used for heating buildings is collected for each building or shared workspace used by the company through meter-level utility invoices for natural gas and supplier invoices for diesel fuel. If primary activity data is not available, benchmarks for fuel consumption per floor area by building type and fuel type breakdown by location are applied as secondary activity data to estimate consumption. Benchmark data is pulled from the US Department of Energy's Building Performance Database for sites within the US, and from the EIA's Energy Efficiency Indicators for other locations.

Hydrofluorocarbon (HFC) emissions from refrigerants are estimated based on building floor area using the US EPA HFC Accounting Tool.

For owned/leased vehicle combustion emissions, activity data includes vehicle and fuel type, mileage data, number of vehicles and location which is obtained from the Goldman Sachs Ground Transportation Team.

Jet fuel mileage consumption data (in gallons and miles) is provided by the Goldman Sachs Travel team. This methodology utilizes flight records and aircraft make/model to estimate fuel consumption where fuel data is not available directly.

For Scope 2, purchased heat, steam, or cooling emissions are evaluated in Scope 2 consistent with GHG Protocol guidance. This methodology collects energy data on district heat, cooling, and steam consumption for each office and data center within the company's boundary. If consumption data is not available, benchmarks for district heat and steam consumption per floor area by country are applied to estimate consumption.

Electricity consumption data for each building used by the company and for computing equipment at each data center is provided monthly using utility invoices. In cases where utilities are unavailable or included in full service gross leases, we apply a benchmark to the square footage using the Department of Energy's Building Performance Database to identify the appropriate Electric Energy Use Intensity (EUI) metric.

In the case of energy use in co-located data centers, if only IT electricity is provided, we apply a power usage effectiveness (PUE) factor to calculate non-IT electricity. If a data center specific PUE factor is provided, we use that. If no factor is available, we use a representative average value.

For scope 3 category 6 business travel, emissions from commercial air, charter jet, rail, hotels, ferry, and car rental are captured. For air travel, data is derived from flight booking records or charter aircraft type. The flight data is then mapped to the relevant flight categories and multiplied by the CO2e emission factor (EF) for that flight category. For ground transportation (road and rail) and hotel stays, data on distance, spend or number of nights is applied to relevant emission factors.

Emissions Factors

The emissions factors applied are summarized in Table 2.

For Scope 2, emissions from purchased electricity are calculated and reported using both the market-based and location-based approach, consistent with the GHG Protocol Scope 2 guidance.

The location-based method considers average emission factors for the electricity grids that provide electricity. The market-based method considers contractual arrangements under which the reporting company procures power from specific sources, such as renewable energy.

An emission factor of zero is used to quantify market-based Scope 2 emissions for all locations with market (i.e. country)-matched renewable electricity products. For regions where it was not feasible to procure market-matched Renewable Energy Certificates or Energy Attribute Certificates due to product or price limitations, the location-based factors are used to quantify market-based emissions.

Tracking Emissions Over Time

Goldman Sachs adheres to the GHG Protocol accounting procedures that require historic emissions data be recalculated as organizations undergo significant structural changes such as acquisitions, divestments, mergers or methodology changes such as error correction and changes in calculation methodology. The historic year adjustments are necessary as structural and methodological changes will alter the historical reporting profile, making meaningful comparisons over time difficult. To maintain consistency over time, or in other words, to keep comparing "like with like", historic emission data must be recalculated. Goldman Sachs uses a threshold of 5% of current year emissions as the recalculation threshold.

Table 2: Scope 1, Scope 2 (location-based), and Scope 3 Category 6 GHG Inventory Emission Factors

Emission Source	Source Reference
Scope 1 – Required Direct Emissions (CO_2e)	
Stationary & mobile fuels: Including natural gas & diesel	US Environmental Protection Agency (EPA) Emissions factor hub If relevant, EFs from UK Department for Environment, Food & Rural Affairs (DEFRA) are used.
Refrigerants	EPA HFC accounting tool California ARB (2021) for high-GWP refrigerants, AR6 GWP is applied and AR5 GWP for refrigerant mixes.
Owned & leased vehicles	US EPA UK DEFRA, adjusted for AR6 GWP Ecoinvent for other countries
Jet fuel	US EPA Emissions factor hub
Scope 2 – Required Indirect Emissions (CO_2e)	
Purchased electricity: United States	eGRID Subregion Emission Factors Department of Energy's Building Performance Database (data as of April 2023)
Purchased Steam: Con-Edison in New York City	Department of Energy's Building Performance Database (data as of April 2023)
Purchased electricity: Outside United States	United Kingdom: Conversion factors from DEFRA (for the calendar year of the footprint) Australia: Australia National GHG Accounts Factors for Australian states' grids (Feb 2023 release) Canada: Canada National Inventory Report 1998 - 2020 for Canada states' grids (2023 release based on 2021 data) "Energy End-uses and Efficiency Indicators", IEA, Paris. Ecoinvent 3.8 or 3.9.1 (beginning 1/2023) Emissions Factor for each country's grid if not available above
Scope 3 category 6 – Optional Indirect Emissions (CO_2e)	
Commercial air	UK DEFRA factors by flight class and distance for airfare; factors without radiative forcing are used.
Ground transport	UK DEFRA and US EPA EF Hub and Ecoinvent are used for rail, fuels, and ground transport modes. Expensed mileage uses US EPA EEIO factors or vendor-specific factors from CDP.
Hotel accommodation	UK DEFRA factors are used for hotel stays.