

GREENHOUSE GAS REPORTING BUILDING BLOCKS FOR ACCOUNTANTS

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Global Accounting Alliance

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FOUNDATIONAL CONCEPTS

GHG Gas Protocol and scope definitions

Greenhouse gas (GHG) emissions reporting is undertaken in three scopes according to all current and forthcoming sustainability reporting standards and requirements:

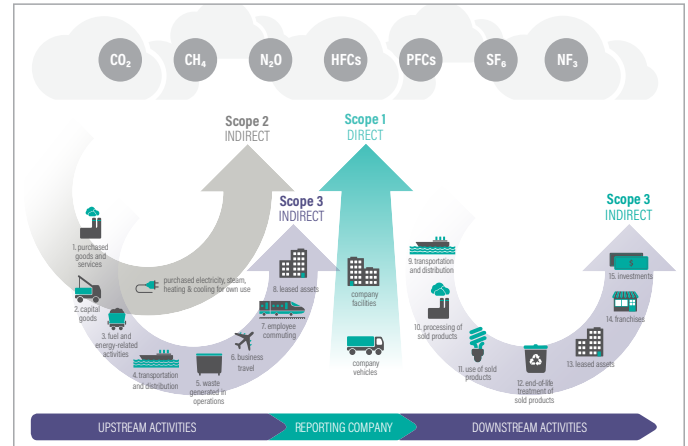
SCOPE 1

Direct emissions generated by the organization – from consuming/combusting fuels of all kinds related to an organization's operations on owned/leased-in assets including vehicles and buildings. For most organizations, it is sufficient to consider the fuel-consumptions/ combustions for scope 1, but in some businesses, especially in the primary sector like forestry, agriculture, and extractive activities, scope 1 emissions may also stem from other sources, such as livestock, soil, burning/flaring of other substances, venting, etc.

SCOPE 2

Indirect emissions based on energy consumption from purchased electricity, heating and cooling.

OVERVIEW OF GHG PROTOCOL SCOPES AND EMISSIONS ACROSS THE VALUE CHAIN

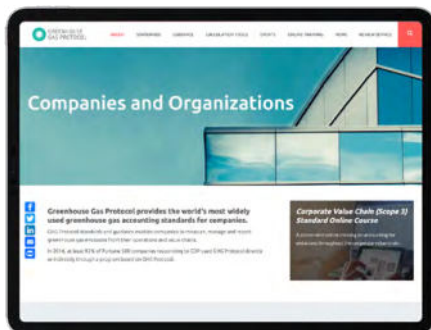


Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard (PDF)

SCOPE 3

Indirect emissions arising from the organization's impacts on the wider economy – arising from the value chain covering up-stream (purchased or acquired goods and services) and downstream (sold goods and services) but also for equity-shared affiliates, which are not included in scope 1 and 2.

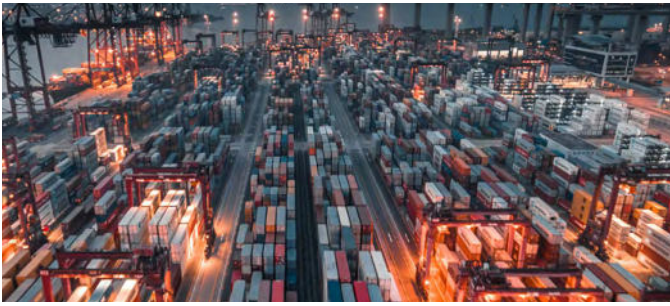
View the linked resources for more information about the various scopes, how they are impacted by the organizational boundaries selected, and the greenhouse gases covered by the [Kyoto Protocol](#) and [The Greenhouse Gas Protocol](#).



Reporting boundaries

The GHG Protocol's [Corporate Accounting and Reporting Standard](#), which is widely used by many organizations to calculate their GHG emissions, permits the use of three organizational boundary methods: The equity share approach or the operational or financial control approach.

- Whichever approach is used, details of the reporting boundaries and methodology used for calculating GHG emissions within reporting boundaries should be documented and applied consistently and disclosed as part of GHG reporting.
- The approach most comparable to the company's financial reporting, and the ability to ensure data is complete, is where the company has financial control, i.e., if the legal entity is fully or pro-rata consolidated in the financial accounts. Comparability to the financial information enables integrated controls between the GHG emissions and the financial information per legal entity, which is especially useful if there are many affiliates. For instance, if a subsidiary has operations, it will also have electricity consumption, or if the company has diesel trucks as tangible fixed assets, it will also have diesel consumption.



- When the organization's financial reporting boundaries are used as the basis of calculating GHG emissions, emissions data is comparable and aligned to financial data. This will also ensure integrated KPIs such as GHG Intensity (GHG emissions/revenue) make sense to investors. Where financial boundaries are being used for GHG emissions data collection, it is helpful to use one consolidation system to avoid duplication and a separate chart of accounts.

INDIVIDUAL LEGAL ENTITY REPORTING

Scopes 1 and 2 GHG emissions

Scope 1 and 2 are relatively straightforward for many organizations involving identifying and aggregating consumptions in quantities. These quantities will typically be found on invoices, for instance when buying fuel or purchasing electricity from a utility provider or landlord. Even relatively mature bookkeeping and ERP systems are typically able to handle such quantities on invoice entries.

- Many accounting or bookkeeping systems utilize scanned invoices, from which both the cost and the quantities are or can be recorded in the system. Consequently, the data collection and evidence of the quantities can be automated with existing tools and only marginally extended processes. With such an approach, it is also relatively easy to apply automated internal controls. For instance, with common unit errors (GJ vs kWh or Tonnes vs Gallons), "check balances" can be included to validate the price per unit against a "normal" price per unit in the ruleset to enable mistakes to be corrected at the time of data entry.
- Once all the consumption quantities are gathered and validated, scopes 1 and 2 GHG emissions data can be calculated by fuel and consumption type. The consumption quantities are multiplied by emission factors to determine the GHG emissions. These can be sourced from various places (see Emission Factor Sources and Calculators)

Supplementary scope 1 emissions from the primary sectors such as forestry, agriculture and extractive activities can be obtained from the production data and/or invoices. For instance, growing area, crop types and outcome, type and quantity of livestock, feed, use of manure, fertilizer-use, flaring of gasses, etc. Emission factors and calculation tools are also made for these specific businesses.

From a validation point of view, there are two key criteria:

- **Correct and complete consumption/production quantities**
- **Relevant and current emission factors**

It is best practice to collect the data as close to the source as possible and implement as many automated controls in the existing systems as possible, whereby GHG emissions data can be validated, and if needed, corrected during the year. In this way, the workload is not entirely at year-end, which also risks creating less time for other financial reporting tasks.

EMISSION FACTOR SOURCES AND CALCULATORS

Many sources provide GHG emission factors for use when making GHG calculations. The primary source which holds emission factors (but does not include a calculation tool) is the International Energy Agency (IEA). IEA is particularly useful for companies with activities in multiple countries given the scope 2 factors are provided per country.

There are many alternative reputable international or domestic sources that also include generic and sector specific calculation tools, including:

[UN Climate Change \(UNFCCC\)](#)

[GHG Protocol](#)

[EPA \(US\)](#)

[DEFRA \(UK\)](#)

[Clean Energy Regulator \(Australia\)](#)

[The Carbon Emissions Calculator](#)
(New Zealand)

[SME Climate Hub/Normative \(SMEs\)](#)

[API \(oil & gas\)](#)

[IPPC-NGGIP \(land use\)](#)

[FAO \(livestock\)](#)

[Cool Farm Alliance](#)
(livestock and soil)

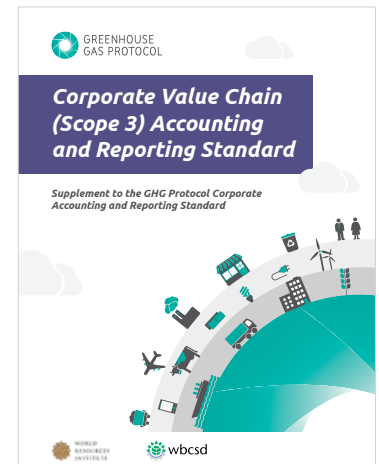
[GHG protocol special sector calculation tools](#) (e.g. cement, iron, wood).



Scope 3 GHG emissions

The GHG Protocol [Corporate Value Chain Accounting Reporting Standard](#) identifies 15 categories for scope 3 GHG emissions: 8 for the upstream emissions and 7 for the downstream emissions.

Upstream Categories	Downstream Categories
Purchased goods and services	Downstream transportation and distribution
Capital goods	Processing of sold products
Fuel- and energy-related activities (not included in scope 1 or scope 2)	Use of sold products
Upstream transportation and distribution	End-of-life treatment of sold products
Waste generated in operations	Downstream leased assets
Business Travel	Franchises
Employee commuting	Investments
Upstream leased assets	



Risk and materiality assessments will identify those categories and activities most relevant and material to the organization. For many organizations, these assessments will take a full value chain and life cycle perspective to adequately identify and manage risks within the supply chain and customer use of products, given scope 3 emissions typically account for much of an organization's emissions footprint.

Scope 3 for *upstream* GHG emissions can be assessed in three ways, which each lead to different quality levels. As organizations mature in their approach, they can move through the three methods, where these are available, to enhance the quality of the data:

- **Spend-based method:** Determine the monetary spend per category and multiply it by average emission factors (Environmentally Extended Input-output factors (EEIO), which also typically provide the EEIO scope 3 GHG emissions factors. This method is the easiest, but also the most imprecise and subject to various distortions such as from changes in prices and foreign exchange rates, and the fact that the conversion factors are based on historical data and averages based on many different products.
- **Activity/quantity-based method:** Collect the quantities of used goods and services (e.g., for business travel: collect the miles travelled every time a business travel flight is booked in the accounting system) and multiply with quantity-defined average emission factors provided in a generic calculation tool, or for instance via the industry based calculator solution from the International Civil Aviation Organization, which supports GHG emissions calculation specifically for passengers and cargo

aviation (for more information, see [ICAO Carbon Emissions Calculator](#)). The emission factors used for the activity/quantity-based method are more precise than spend-based factors, as price distorting elements are eliminated.

- **Supplier-specific method:** Utilize primary data from supply chain partners as a basis, a more advanced approach. The emissions factor is based on information from an individual supplier and specific to the services or goods purchased. For instance, most utility providers provide the exact emissions per purchased kWh of energy from their specific utility. An increasing number of

organizations also provide the GHG emissions data for goods/services sold directly on the invoices, which then can be extracted when the invoice is scanned or typed in, for instance can professional service-providers like consultants, auditors and/or lawyers easily include the emissions per FTE-hour invoiced on the offer and invoice. This makes the dialogue much faster and more precise for both the supplier and the customer. This method also enables the organization to make better decisions regarding GHG emissions for specific suppliers. Blockchain platforms such as the [EY OpsChain ESG](#) potentially also help provide accurate and verifiable GHG emissions data.



Scope 3 for *downstream* GHG emissions is more challenging to calculate, as it is often difficult to know how customers use a good or service, and for goods, when and how they will be scrapped. This will typically require the organization to make assumptions about the use of the services and products and their disposal. The methods and assumptions should be clearly described and documented, which will also assist in developing suitable criteria that the auditor or assurance practitioner will need for their procedures on the downstream data. The main input from the accounting process is from the sale records (i.e., quantities sold). Subsequently, GHG emission factors can be based on one of the following, but these methods may not be useable for every type of downstream emissions:

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| <ul style="list-style-type: none"> • Industry associations' average factors: Some industry associations develop factors that can be used for scope 3 downstream GHG emissions. As for use of average factors on upstream emissions, these are less precise, and the organization cannot readily measure the impact of GHG emission reduction initiatives they have undertaken for their customers. However, they are usually better than more generic factors. | <ul style="list-style-type: none"> • Company-specific factors are typically based on numerous inputs such as customer surveys, and technical tests of lifetime data input from sold products (e.g., for electronic products which still correspond with the producing factory). For example, many newly produced cars provide data back to the car factory automatically about the usage of the car and perhaps also maintenance or | <p>amounts of returned products for scrapping. Some organizations have made it possible to return the used product to the company, whereby the company takes care of the disposal, enabling them to control how it is done and to measure the emissions more precisely.</p> |
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- **Collecting actual GHG emissions:** For equity-investments, the shareholder company can often collect the actual GHG emissions from the investee company's GHG emissions reports either directly or via third parties such as ESG rating agencies. If such reports are not available, investors can use average GHG emission factors (EEIO) provided by these third parties which are less precise but can be used to secure the completeness of the scope 3 GHG emissions footprint. Regardless of the method, investments should be included proportional to the equity share which the CFO and controllership function should validate. Particularly for

companies within financing and insurance, the Partnership for Carbon Accounting Financials (PCAF) has developed methods for measuring financed and insured GHG emissions.

GHG emissions and financial accounting are deeply connected, no matter the methods used. An external auditor or assurance practitioner will be able to evaluate the coverage of bought and sold services and goods, to ensure completeness of scope 3 GHG emissions reported – whether it is done using average conversion factors – or in a more advanced way with more accurate emissions for suppliers and customers.



CONSOLIDATION AT A GROUP LEVEL

When reporting for a group, one efficient approach can involve consolidating consumption data in the financial consolidation system – and then subsequently calculating scope 1 and 2 GHG emissions at the group level. Another good approach is to allow legal entities to report both scope 1 and 2 GHG emissions but also the quantities used for the calculations, whereby the calculations can be verified easily. The financial consolidation system provides the necessary controls and ensures complete comparability to financial information.

- If an individual legal entity only provides the finalized calculations of scope 1 and 2 GHG emissions to the head office without the underlying consumption data, the head office may find it more difficult to validate the data provided, as they cannot identify and validate the underlying consumptions or the GHG calculation. This is particularly the case where reporting is immature in subsidiaries or affiliates, and information is only reported to

the group once a year. Visibility of underlying consumption driving GHG emissions is needed to be able to verify that the reporting is accurate and complete, so it is important that affiliates and entities provide both quantities and related emissions.

- The approach to scope 3 consolidation depends on the company's process and systems structure and needs careful consideration to avoid double counting within the group. Calculating scope 3 GHG emissions per legal entity and then consolidating, or calculating centrally for the entire group, depends on whether the entire company has a common purchase-system for the upstream emissions and a common sales-system for the downstream emissions. If not, the calculations and data collection will have to occur at each legal entity (excluding intercompany postings to avoid double counting emissions) and then be consolidated at group level.

THE INTERNATIONAL SUSTAINABILITY STANDARDS BOARD (ISSB)

The IFRS Foundation created the ISSB to sit alongside the International Accounting Standards Board (IASB) to develop standards for a comprehensive global baseline of sustainability disclosures meeting the information needs of global investors.

These standards enable companies to provide comprehensive, decision-useful sustainability information to global capital markets, and deliver a common language of sustainability disclosures with the flexibility for regional “building blocks” to be added by regulators when necessary to meet local and multi-stakeholder information needs.

The ISSB has to date issued two proposed [standards](#) to be approved in 2023 and to be effective for annual reporting periods beginning 1 January 2024:

- IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* establishes the general reporting requirements for sustainability-related financial disclosures applicable across jurisdictions. S1 emphasizes the consistency and connections between the financial statements and sustainability disclosures, and the need to publish financial statements and sustainability disclosures at the same time.
- IFRS S2 *Climate-related Disclosures* is used in accordance with IFRS S1 to disclose material information about climate-related risks and opportunities including physical risks (e.g., flood risk), transition risks (e.g., regulatory change) and climate-related opportunities (e.g., new technology).

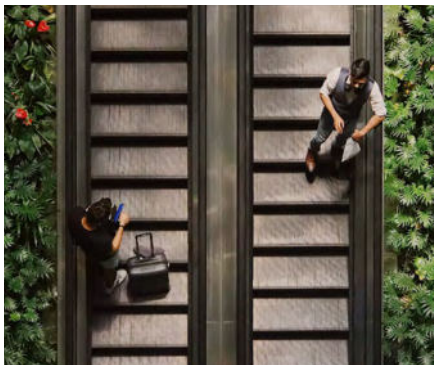
Both IFRS S1 and IFRS S2 are based on the Taskforce for Climate-related financial disclosures (TCFD) Recommendations and guidance. IFRS S2 requires an organization to disclose the following:

- **Governance** - the governance processes, controls and procedures an entity uses to monitor and manage climate-related risks and opportunities;
- **Strategy** - the climate-related risks and opportunities that could enhance, threaten or change an entity’s business model and strategy over the short, medium and long term;
- **Risk management** - how climate-related risks and opportunities are identified, assessed, managed and mitigated by an entity; and
- **Metrics & targets** - the metrics and targets used to manage and monitor an entity’s performance in relation to climate-related risks and opportunities.



IFRS S2 includes a requirement to disclose GHG emissions, in accordance with the [GHG Protocol Corporate Standard](#), and companies must report scope 3 GHG emissions when material (a temporary exemption when applying IFRS S2 for the first time will allow companies time to get their processes in place). Disclosure on the methods used to measure GHG emissions, including specific inputs, assumptions and estimation techniques, plus information about changes, will also be required. The ISSB intends to provide a framework for Scope 3 measurement that incorporates use of estimation.

IFAC’s actions to support convergence to global sustainability disclosure and assurance standards is available [here](#).



CONNECTING GHG REPORTING TO OTHER FINANCE TOOLS

Over time, the finance team can consider the benefits of applying or extending their activity-based costing (ABC) approach to identify and compare the GHG footprint of particular products, services, and activities. An environmental ABC model leverages an organization’s emissions inventory and assigns the GHG footprint to particular products, services and activities which helps to focus planned improvements in environmental performance.

To learn more about the connection between GHG accounting and ABC, see this: [Using Management Accounting to Drive Environmental Performance | IFAC](#)



TIPS FOR IMPROVING THE GHG EMISSIONS REPORTING PROCESS

Many organizations already engage in some GHG emissions reporting, these tips can improve the process.

Effective collaboration between financial and sustainability colleagues, leveraging their respective skills and insights and extending the financial systems and processes.

Use invoices and bookkeeping information for data collection instead of meter readings and local measurements. This method:

- Reduces the risk of human errors;
- Is less time-consuming;
- Increases the quality of the evidence, making it a more reliable source during an external assurance engagement; and
- May be more suitable for more timely reporting, such as at the same time as the annual report.

Involve both the sustainability, finance and operational functions in the data collection process:

- Comparing data collected from two sources, one financial and one operational can help to validate the outcomes. For instance:
 - Electricity expense compared to kWh of electricity used; or
 - Upstream scope 3 GHG emissions for capital goods compared to the value for tangible fixed assets in the financial statements.

Leverage the internal controls for data collection and reporting from the financial reporting process.

- The more internal controls that can be performed in an efficient way, the better the data quality.

Extend existing financial systems to collect the data from individual legal entities and the financial consolidation system to consolidate data from these entities to:

- Improve the connectivity of the information with financial information and improve the ability to assess the completeness and reduce the cost of maintenance over time that can be associated with stand-alone ESG or other systems;
- Eliminate data collection within spreadsheets and/or emails which can be more time-consuming and lack a sufficient audit trail.

For a roadmap to prepare finance and accounting professionals to align GHG emissions reporting with financial reporting, see [8 Steps to Enhance GHG Reporting: A Roadmap for Accounting and Finance Professionals](#).

ADDITIONAL RESOURCES



World Business Council for Sustainable Development, [*Guidance on improving the quality of ESG information for decision-making*](#), Developing a roadmap for companies.



Accounting for Sustainability, [*A4S Sustainability Reporting Insights Series*](#) including [*Reporting Insights*](#), [*Sustainability Data Collection*](#), [*Briefing for Finance: Climate Action*](#) and [*Navigating the Reporting Landscape*](#).



CPA Canada, [*GHG Emissions Management: Linking to strategy, risk, and performance management*](#).



The Committee of Sponsoring Organizations of the Treadway Commission (COSO), [*Achieving Effective Internal Control over Sustainability Reporting \(ICSR\): Building Trust and Confidence through the COSO Internal Control-Integrated Framework*](#).



[*A "Day in the Life" of a Sustainability Reporting Senior Manager*](#), Anne-Marie Vitale.



[*Carbon Quotient: Accounting for Net Zero*](#), Greg Rogers and Samantha Ross.