KPMG

GHG emissions reporting

Handbook

Greenhouse Gas Protocol

December 2024

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Contents

Prime time for the GHG Protocol

The GHG Protocol has gone from obscurity in the world of financial reporting to having its moment in the spotlight.

The Protocol is the foundation leveraged by both IFRS® Sustainability Disclosure Standards and European Sustainability Reporting Standards for reporting GHG emissions. And in the US, thousands of companies are set to report in accordance with the GHG Protocol under the California climate laws.

With this level of adoption – in addition to widespread voluntary reporting – comes increased scrutiny and pressure on the words in the standards. Originally inspired by financial reporting concepts, the Protocol now finds itself lagging today's accounting concepts.

Timely then that the Protocol has embarked on an ambitious project to update its standards with the International Sustainability Standards Board, and other financial reporting stakeholders, monitoring carefully. Exposure drafts on a variety of issues are expected in 2025 and we encourage all finance professionals to think carefully about the proposals and their application for corporate reporting. Your voice counts!

In the meantime, we hope this handbook helps to provide you with a foundational understanding of GHG emissions reporting. Anchored in the Protocol. Your GHG 101.

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About this publication

The purpose of this handbook is to assist you in understanding the accounting and reporting of GHG emissions through the lens of the following standards and guidance of the Greenhouse Gas Protocol:

- A Corporate Accounting and Reporting Standard
- Scope 2 Guidance
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

For finance professionals

This handbook provides an introductory explanation of GHG emissions reporting. It is not intended to be exhaustive or to facilitate an expert level of understanding.

It is written for finance professionals who are more familiar with financial reporting and generally accepted accounting principles. As such, we explain concepts in a way that we think will be the most understandable for this audience.

Throughout this handbook, we provide a brief overview of how the requirements of the GHG Protocol compare to the following:

- IFRS Sustainability Disclosure Standards issued by the International Sustainability Standards Board (ISSB); and
- European Sustainability Reporting Standards (ESRS) developed by the European Financial Reporting Advisory Group (EFRAG) under delegated authority of the European Commission.

ISSB	ESRS
• IFRS S1, General Requirements for Disclosure of Sustainability-related Financial Information • IFRS S2, Climate-related Disclosures	• ESRS 1, General requirements • ESRS E1, Climate change

See KPMG resources for further materials about these standards and rules.

Excerpts from the Greenhouse Gas Protocol

This handbook includes a number of excerpts from the standards and guidance of the Greenhouse Gas Protocol. That material was developed by the World Resources Institute and the World Business Council for Sustainable Development.

The GHG Protocol is currently updating its governance and standards. Read more in chapter 2 (Future developments).

December 2024 edition

This edition of our Handbook includes both new guidance (identified with **) and updated guidance (identified with #) based on our continued experience in responding to questions about the application of the GHG Protocol. In particular, this edition includes new guidance on emissions factors (chapter 5 and chapter 7). The Index of changes includes a full listing.

References to the literature

Our commentary is referenced to the Greenhouse Gas Protocol standards and/or guidance citing page numbers (p or pp).

The following are examples of how we reference.

Reference	Short-cut name	Proper title
GHGP	Corporate Standard	A Corporate Accounting and Reporting Standard
GHGP S2	Scope 2 Guidance	GHG Protocol Scope 2 Guidance
GHGP S3	Scope 3 Standard	Corporate Value Chain (Scope 3) Accounting and Reporting Standard
GHGP S3C	Scope 3 Calculation Guidance	Technical Guidance for Calculating Scope 3 Emissions
GHGP G	Required Gases in Inventories	Required Greenhouse Gases in Inventories
GHGP PA	Project Standard	The GHG Protocol for Project Accounting
GHGP MGS	Mitigation Goal Standard	Mitigation Goal Standard

Abbreviations and terminology

We use the following abbreviations and terminology in this handbook:

The greenhouse gases

CH4 Methane

CO2 Carbon dioxide

GHG Greenhouse Gas

NF3 Nitrogen Trifluoride

N2O Nitrous Oxide

HFCs Hydrofluorocarbons

PFCs Perfluorocarbons

SF6 Sulphur Hexafluoride

Emissions measurement

CO_2e	Carbon Dioxide Equivalent
kWh	Kilowatt Hour (of electricity)
mt	Metric tonnes
MWh	Megawatt Hour (of electricity)
MMBtu	Million Metric British thermal units
t	Tonnes
EEIO	Environmentally-extended input output
GWP	Global Warming Potential

Renewable energy

EAC	Energy Attribute Certificate
GO	Guarantee of origin
PPA	Power Purchase Agreement
REC	Renewable Energy Certificate
T&D	Transmission and Distribution

Organizations relevant to emissions measurement

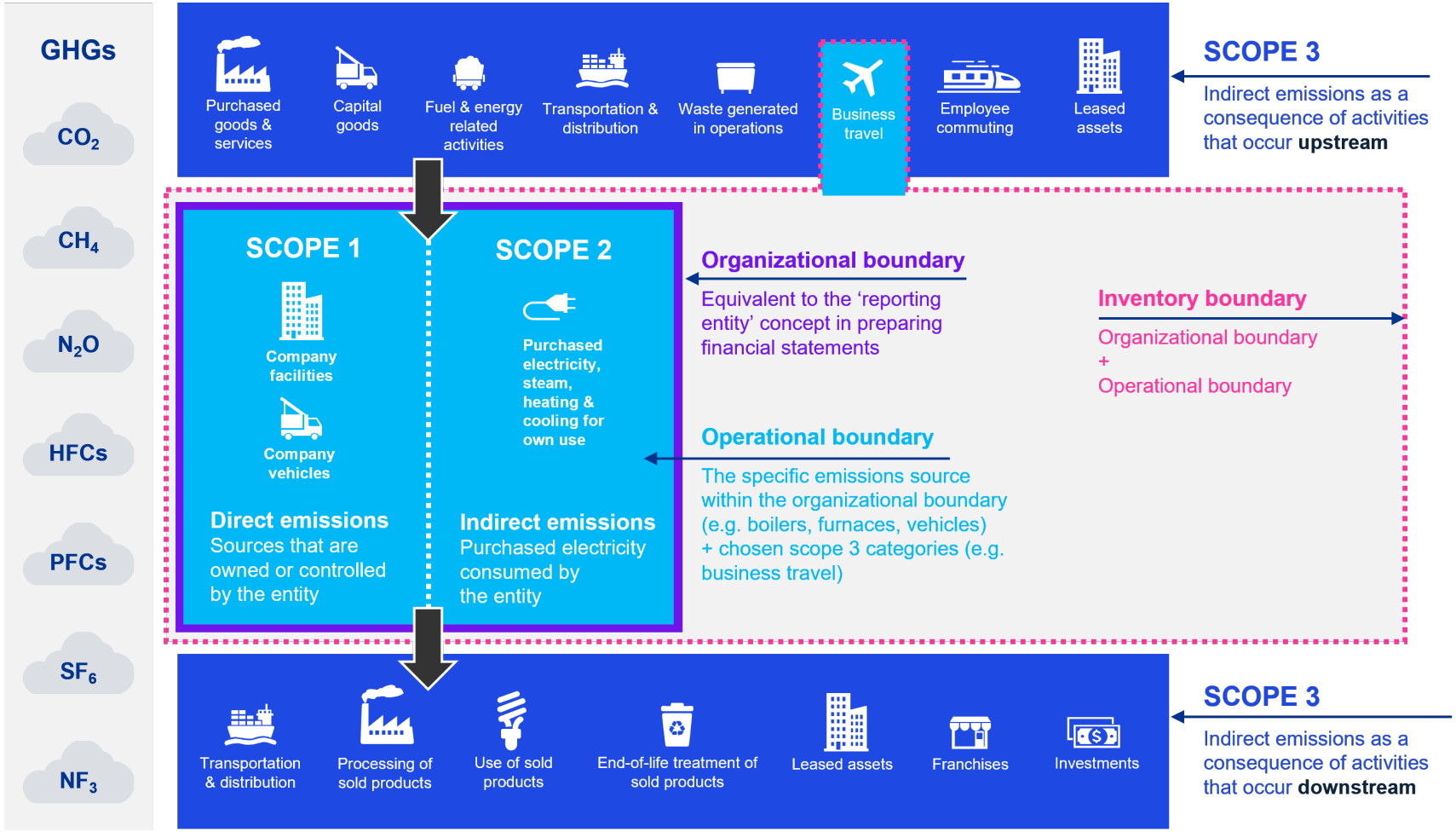
CDP	Carbon Disclosure Project
EPA	Environmental Protection Agency
GHGP	Greenhouse Gas Protocol
ICVCM	Integrity Council for the Voluntary Carbon Market
IPCC	Intergovernmental Panel on Climate Change
PCAF	Partnership for Carbon Accounting Financials
SBTi	Science Based Targets initiative
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute
WBCSD	World Business Council for Sustainable Development

Organizations/standards relevant to emissions disclosures

EFRAG	European Financial Reporting Advisory Group
ESRS	European Sustainability Reporting Standards
IOSCO	International Organization of Securities Commissions
ISSB	International Sustainability Standards Board

1. Executive summary

The following diagram provides a roadmap to the elements of emissions reporting under the GHGP that are discussed in this handbook. The diagram illustrates business travel as the only scope 3 category included in the operational boundary and therefore in the inventory boundary.



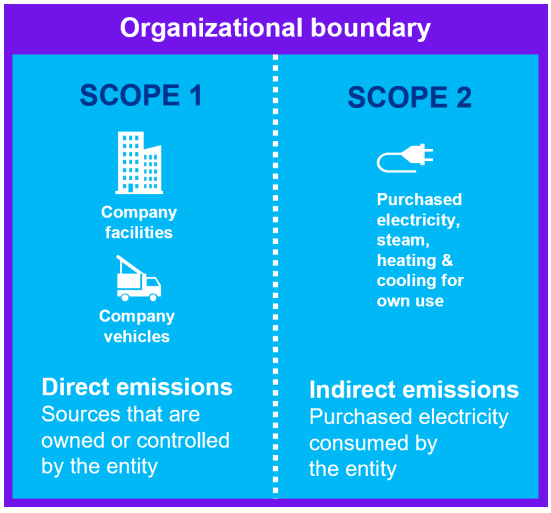
The following diagram organizes the above elements into a more linear depiction of how GHG emissions data is gathered and how it is used – with references to the relevant chapters in the handbook.

			Chapter
Gather the information	Step 1	Define the organizational boundary	3
	Step 2	Classify sources of emissions	4, 6, 7, 8
	Step 3	Calculate emissions	5
Use the information	Step 4	Track emissions	9, 10
	Step 5	Report emissions	11

Step 1: Define the organizational boundary

The first step toward reporting emissions is to determine the organizational boundary. The organizational boundary is equivalent to the 'reporting entity' concept in preparing a set of financial statements. Once that boundary has been determined, the sources of emissions to be reported can be identified.

The organizational boundary frames the scopes 1 and 2 emissions that fall into the overall inventory boundary.



In setting an organizational boundary, the GHGP allows an entity-level selection of a control approach or an equity share approach. Within the control approach, there is a further option of a financial control or operational control approach.

These approaches drew on accounting standards in effect when the GHGP Corporate Standard was developed. There are two factors that contribute to the

fact that these approaches cannot simply be equated to the application of financial reporting standards even though the terms are very familiar. First, the standards in effect when the Corporate Standard were developed are different from the standards in place today (not least under IFRS Accounting Standards and US GAAP). Second, the guidance developed by the GHG has largely been applied outside of the finance profession.

Read more: Chapter 3

Step 2: Classify sources of emissions

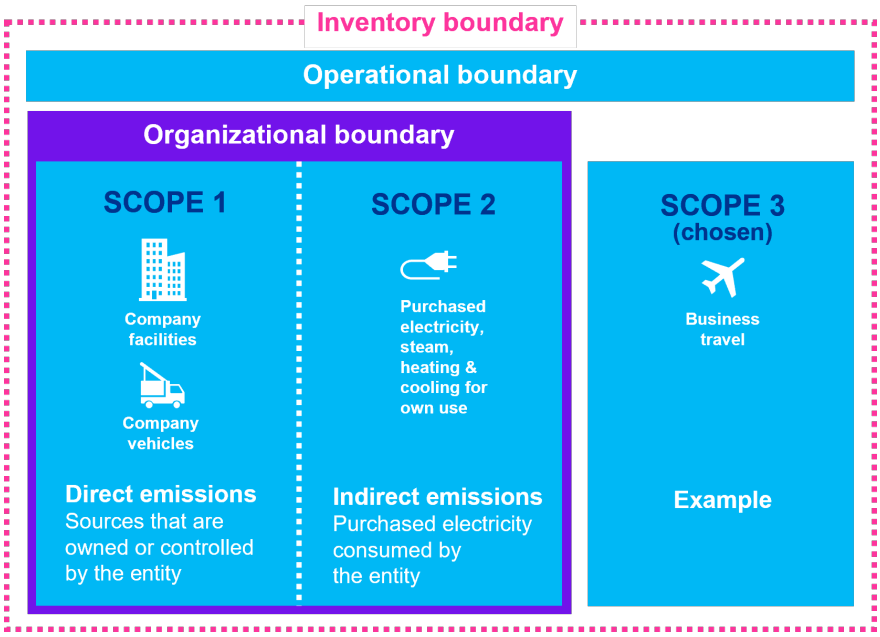
The second step toward reporting emissions is to classify them by source. This comprises two parts:

- define the operational boundary; and
- identify and categorize emissions.

Define the operational boundary

The operational boundary comprises all sources of emissions within the organizational boundary plus scope 3 categories at the discretion of the entity. The following diagram illustrates business travel (but not the other scope 3 categories) being included in the operational boundary.

Together, the organizational boundary and the operational boundary are called the inventory boundary.



Identify and categorize emissions

- **Scope 1:** Scope 1 emissions are direct – i.e. they are from sources that are owned or controlled by the entity – and therefore occur within the organizational boundary.

- **Scope 2:** Like scope 1, scope 2 emissions occur within the organizational boundary. However, unlike scope 1, they are indirect emissions because they do not occur from sources that are owned or controlled by the entity. Rather, they represent purchased electricity that is generated outside the organizational boundary but consumed within the boundary.
- **Scope 3:** Unlike scopes 1 and 2, scope 3 emissions occur outside the organizational boundary. They are indirect emissions – because they do not occur from sources that are owned or controlled by the entity – but are part of an entity's upstream or downstream value chain.

  In addition, they are not required to be reported if an entity is following the GHGP Corporate Standard. Instead, an entity can elect to report one or more categories within scope 3 – e.g. business travel and employee commuting.

  Entities that are required, or elect, to report all relevant scope 3 emissions comply with the GHGP Scope 3 Standard in addition to the GHGP Corporate Standard.

Read more: Chapters 4 (operational boundary), 6 (scope 1), 7 (scope 2) and 8 (scope 3)

Step 3: Calculate emissions

The third step toward reporting emissions is to perform the calculations based on all emissions in the inventory boundary.

Calculations are performed using the following formula.

tCO_2e	=	Activity data	×	Emission factor	×	GWP
Tonnes of CO_2 equivalent		Estimated measure of activity related to a specific emissions source		Factor applied to make varied activities comparable		Multiplier that makes different GHGs comparable

Read more: Chapter 5

Step 4: Track emissions

The first three steps are focused on gathering the information necessary to create the GHG inventory.

The final two steps are focused on using the GHG emissions inventory. One use is to track emissions over time. This involves two parts:

- develop a base year; and
- set reduction targets.

Develop a base year

A base year is a benchmark that allows an entity to observe trends in emissions information. To maintain consistency, it may be necessary to recalculate the base year, and other historic, emissions. Such recalculations may be triggered by a variety of circumstances – e.g. an acquisition, change in methodology.

Set reduction targets

GHG emissions reduction targets are increasingly used by entities that commit to reduce GHG emissions by a certain amount by a certain year. The terms 'net-zero' and 'carbon neutral' are frequently used to identify a GHG emissions reduction commitment.

Once an entity sets a GHG emissions reduction target, it actions an emissions reduction plan to reduce the gross emissions within its inventory boundary as much as possible. As the GHG emissions reduction plan progresses over time, the entity may plan to purchase offset credits that neutralize residual emissions that cannot be eliminated.

Offset credits are the result of GHG project accounting. The GHGP Project Standard provides guidance for quantifying and reporting GHG reductions from GHG projects. Although this kind of accounting is separate and distinct from the accounting for GHG inventories, there is a connection between the two.

The output of project accounting (offset credit) may be an input into a corporate emissions inventory report if the entity elects to use offset credits. Offset credits are not part of the calculation of gross emissions, but instead are presented separately in an entity's emissions statement.

Corporate emissions inventory		Project accounting
the inventory boundary	**Define**	the assessment boundary
actual emissions for each source within the boundary	**Estimate**	baseline (hypothetical) emissions
all emissions within the boundary	**Total**	difference between baseline emissions and project emissions
purchase offset credits	**Transact**	sell offset credits

Read more: Chapters 9 (tracking emissions and setting targets) and 10 (offset credits)

Step 5: Report emissions

The last step in the process is to report the information gathered and tracked. The presentation and disclosure requirements of the GHGP differ depending on whether an entity elects to follow just the Corporate Standard (including the Scope 2 Amendment) or is also following the Scope 3 Standard.

Read more: Chapter 11

2. Foundational concepts

Detailed contents

Item significantly updated in this edition #

2.1 How the GHGP works

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Although GHGs occur naturally (e.g. from respiration and decomposition of plants), their release is also associated with certain human activities (referred to as anthropogenic emissions). An increase in GHGs in the atmosphere leads to an increase in average surface temperatures, along with other effects – e.g. ocean acidification, smog pollution, ozone depletion.

Global treaties provide guidelines for countries to develop targets to reduce their GHG emissions at the national level. In particular, the Paris Agreement aims to limit global warming to well below 2 degrees Celsius (above pre-industrial levels) and pursue efforts to limit it to 1.5 degrees Celsius.

GHG emissions reduction targets at the country level are increasingly supported by targets at the corporate level. Setting meaningful targets and tracking progress over time requires the measurement and reporting of GHG emissions.

The GHGP is currently the most widely used framework for GHG emissions measurement. It was formed in 1998 as a partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Since that time, the GHGP has released multiple standards and guidance documents, and has become the leading benchmark for measuring and reporting GHG emissions.

The GHGP's central role in GHG accounting makes it important as financial reporting standard-setters and regulators establish their own requirements for disclosing GHG emissions – many of which refer to or otherwise leverage the GHGP.

This chapter provides some of the history to GHG emissions reporting and a brief introduction to some of the concepts discussed later in this handbook.

2.2 Background to GHG emissions reporting

Question 2.2.10
How did the demand for GHG emissions reporting originate?

Interpretive response: There has been a growing trend, fueled by stakeholder demand and regulatory action, for corporations to report GHG inventories (see Question 2.3.60).

To develop a corporate GHG inventory, an entity identifies emissions arising from specified sources within a defined boundary and tracks those emissions over time (see the roadmap diagram in the executive summary). This type of reporting, the attribution of GHG emissions to a specific entity, is addressed by the GHGP (see Question 2.3.10).

But first, it's important to understand the events that have led to the growing demand for corporate GHG reporting.

The following is a timeline of select key events, followed by definitions and descriptions.

1990 The IPCC released its first report: Human activities contribute to increased emissions that warm the planet.

1994 UNFCCC created: Agreement on the need to act to limit emissions.

1997 Kyoto Protocol adopted: Certain industrialized nations commit to emissions reductions.

2015 Paris Agreement adopted: A broader group of nations commit to limit warming to 1.5 degrees Celsius.

2021 SBTi released its Net Zero Standard: Call for corporations to transition to net zero.

IPCC: Intergovernmental Panel on Climate Change

The IPCC is a United Nations body responsible for assessing the science related to climate change. See Question 5.2.30.

UNFCCC: United Nations Framework Convention on Climate Change

The UNFCCC is an international treaty to reduce global warming and cope with the consequences of climate change. While the UNFCCC encouraged industrialized countries to stabilize GHG emissions, the Kyoto Protocol, adopted at a UNFCCC conference, committed them to doing so.

Kyoto Protocol

The Kyoto Protocol is a climate treaty that entered into force in 2005. A group of industrialized countries (signatories) committed themselves to the GHG emissions reductions targets introduced by the Kyoto Protocol. These targets

were implemented in rolling emissions reductions commitment periods, with the first period from 2008 to 2012, and the second period from 2013 to 2020.

In the first commitment period, signatories were required to report four specific GHGs (CO_2, CH_4, N_2O and SF_2) and two classes of GHGs (PFCs and HFCs). In the second commitment period, signatories were also required to report NF_3 emissions. See Question 2.2.20.

The Kyoto Protocol was effectively replaced by the Paris Agreement.

Paris Agreement

The Paris Agreement is an international treaty on climate change. It was adopted by 196 signatories at COP21 in Paris and entered into force on November 4, 2016. Its central aim is to limit global warming to well below 2 degrees Celsius (above pre-industrial levels) and pursue efforts to limit it to 1.5 degrees Celsius. Unlike the Kyoto Protocol, which focused only on industrialized countries, the Paris Agreement calls upon all countries to set emissions reduction targets.

SBTi: Science Based Targets initiative

The SBTi enables entities in the private sector to set science-based emissions reduction targets. When a target is 'science-based', it is consistent with the goals of the Paris Agreement. See Question 9.3.40.

Question 2.2.20
What are the main GHGs that are tracked?

Interpretive response: The Kyoto Protocol identified seven GHGs that nations would track and report. The seven main GHGs, and their predominant anthropogenic (human-caused) sources, are identified in the following table.

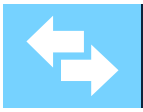
Gas	Predominant anthropogenic sources
Carbon dioxide (CO_2)	• combustion of fossil fuels • forest clearing and other biomass burning • cement production
Methane (CH_4)	• agricultural processes – e.g. wetland rice cultivation • enteric fermentation in animals • decomposition of animal waste • decomposition of municipal solid waste • distribution of natural gas and petroleum • by-product of coal mining and incomplete fossil fuel combustion
Nitrous oxide (N_2O)	• production of nitrogen-fixing crops and forages • use of synthetic and manure fertilizers

Gas	Predominant anthropogenic sources
	• manure deposition by livestock • fossil fuel combustion, especially mobile combustion • wastewater treatment and waste incineration • biomass burning
Hydrofluorocarbons (HFCs)	• air conditioning • refrigeration • aerosol propellants • fire extinguishers and solvents
Perfluorocarbons (PFCs)	• aluminum and semiconductor chip manufacturing
Sulphur hexafluoride (SF_6)	• leakage from electrical switchgear • magnesium casting and smelting processes • use in semiconductor manufacture
Nitrogen trifluoride (NF_3)	• manufacture of semiconductors, certain types of solar panels and chemical lasers

The GHGP requires entities to measure and report the emissions of these seven GHGs. See Question 11.3.30 and Appendix A.

In our experience, CO_2, CH_4 and N_2O are likely the most prominent GHGs emitted by an entity. The remaining GHGs are less likely to be prominent for the following reasons.

- **SF_6** is primarily used by the electric power industry to manage the high voltages in the transmission system, including circuit breakers, gas-insulated substations and other switchgear used between generating stations and customer load centers.
- **NF_3** is primarily released as process emissions from semiconductor and other electronic production. It is likely relevant to the electronics industry, but unlikely relevant to most other entities.
- **HFCs and PFCs** are considered ‘classes of GHGs’ because they are composed of other gases. HFCs are molecules composed of carbon, fluorine and hydrogen; PFCs are molecules composed of carbon and fluorine. All are human-made and not produced by any processes other than human activities.



Reporting landscape
Main GHGs

As shown in the following table, each framework requires all seven GHGs to be reported by entities.

ISSB	ESRS
An entity reports GHG emissions (in CO_2e) inclusive of all seven gases in the Kyoto Protocol. [IFRS S2.A, B20-B21]	An entity reports GHG emissions (in CO_2e) inclusive of all seven gases in the Kyoto Protocol. [ESRS E1.AR39(c)] Reporting inclusive of additional gases may be considered when significant. [ESRS E1.AR39(c)]

Question 2.2.30
What are the sources of GHG emissions?

Interpretive response: To help entities make informed decisions about their emissions, the GHGP distinguishes between direct and indirect emissions sources and categorizes these sources into three scopes. [GHGP pp 27-29]

Scope	Category	Description	Examples
Scope 1	Direct	Sources that are owned or controlled by the entity	Boilers, furnaces, vehicles
Scope 2	Indirect: electricity	Purchased electricity consumed by the entity	Electricity, steam, heat, cooling (collectively referred to as 'electricity')
Scope 3	Indirect: other	Consequence of activities of the entity that occur from sources not owned or controlled by the entity	Extraction and production of purchased materials, transportation of fuels, use of sold products and services

Scopes 1 and 2 are GHG emissions that are owned or controlled by an entity; scope 3 emissions are a consequence of the activities of the entity (upstream or downstream) but occur from sources not owned or controlled by it.

Scope 3 is further broken down into 15 categories (e.g. processing of sold products, use of sold products, end-of-life treatment of sold products), which are discussed in chapter 8.

The intent of these categorizations is to provide insights for entities to make informed decisions about their emissions – e.g. target-setting, cost reduction,

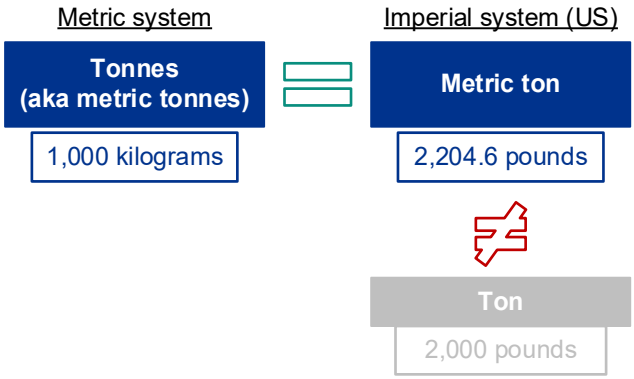
improved efficiencies – and is integral to the reporting of GHG emissions (see chapter 11).

Question 2.2.40
What is the unit for measuring GHG emissions?

Interpretive response: GHG emissions are measured in tonnes. The tonne, a unit of mass based on the metric system, is equal to 1,000 kilograms (or about 2,204.6 pounds). A tonne may also be referred to as a metric tonne.

In the US, which uses the imperial system, a tonne is known as a 'metric ton'. This is different from the term 'ton', which in the US refers to 2,000 pounds.

The following diagram summarizes this information.



The terms 'tonne', 'metric tonne' and 'metric ton' may be used interchangeably. Throughout this handbook, we refer to tonnes of carbon dioxide equivalent (tCO_2e). This concept is further discussed in chapter 5.

CO_2e may also be expressed as million metric tonnes of CO_2e. This is similar to the financial statement concept of presenting numbers in thousands. This concept will not be used throughout this handbook, but readers should be aware of it for regulatory or jurisdictional reporting purposes.

Reporting landscape
Unit of measure

As shown in the following table, each framework requires reporting in the same measure: the tonne.

ISSB	ESRS
Refers to metric tonnes of CO_2e. [IFRS S2.29(a)(i)]	Refers to metric tonnes of CO_2e. [ESRS E1.44]

2.3 The role of the GHGP

Question 2.3.10
What is the GHGP?

Interpretive response: The GHGP is currently the most widely used framework for GHG emissions measurement. The following table provides further information about its purpose and content.

What is it?	An international set of standards, guidance, tools and training designed to deliver a consistent method of measuring, reporting and managing GHG emissions.
When was it created?	Formed in 1998; with updates made over the years.
Where did it originate?	A partnership between the WRI and the WBCSD.
Who uses it?	Private and public sector entities.
How is it used?	To measure and manage GHG emissions associated with individual products or entire value chains.
Why is it useful?	Provides a data-driven approach to help entities identify which activities in their value chains generate the most emissions, thereby supporting global reduction of emissions.

Question 2.3.20
What guidance is available under the GHGP?

Interpretive response: The GHGP has developed two standards and numerous guidance documents to support the measurement and reporting of GHG emissions. The following table outlines the GHGP documents that are relevant to this handbook.

Issued	Amended	Title	Purpose
2001	2004 2013 2015	A Corporate Accounting and Reporting Standard	Provide requirements and guidance for entities preparing a GHG inventory.
2005	N/A	Project Accounting	Provide principles, concepts and methods for quantifying and reporting GHG reductions from climate change mitigation projects.

Issued	Amended	Title	Purpose
2011	2013	Corporate Value Chain (Scope 3) Accounting and Reporting Standard	Provide a methodology for entities to assess their entire value chain emissions impact and identify where to focus reduction activities.
2013	N/A	Technical Guidance for Calculating Scope 3 Emissions	Provide detailed technical guidance on relevant calculation methods for scope 3 emissions.
2013	N/A	Required Greenhouse Gases in Inventories[1]	Amend requirements regarding the GHGs to include in inventories, as well as how the emissions of those GHGs should be reported within inventories.
2014	N/A	Mitigation Goal Standard	Provide an accounting and reporting standard for national and subnational GHG reduction goals.
2015	N/A	Scope 2 Guidance[1]	Provide standardized guidance on how entities measure emissions from purchased or acquired electricity, steam, heat and cooling.

Note:
1. Issued as an amendment to the Corporate Accounting and Reporting Standard (Corporate Standard).

Chapter 11 discusses considerations around reporting in accordance with the above standards.

The GHGP also provides other standardized frameworks (e.g. Global Protocol for Community-Scale Greenhouse Gas Inventories, Product Life Cycle Accounting and Reporting Standard) that are outside the scope of this handbook.

Future developments#

GHG Protocol update project

March 2023 marked the closure of a five-month feedback collection process to inform updates to the GHG Protocol's standards and guidance. Since then, the GHGP Secretariat has established the governance structure that will oversee the update process, consisting of an Independent Standards Board (ISB) and Steering Committee (SC). The workplans approved by the ISB and SC will be carried out by four Technical Working Groups (TWGs) over two years.

- Drafts of revised text are expected in the second half of 2025, with final standards / guidance expected in the second half of 2026.

- A public consultation process of the draft standards is expected to occur before finalization of the standards.
- Updated standards are expected to go into effect immediately.
- Decisions about the transition period for adoption will be made by the ISB and SC.

The planned update and development process is organized to be an inclusive process that brings the standards / guidance into renewed accord with best practice approaches to measuring and tracking emissions, as well as accounting rules.

More information is available on the GHGP's website.

Land sector and removals guidance

Following a multi-stakeholder development process that began in 2020, land sector and removals guidance will be issued in early 2025. This new guidance will aid the reporting of land management, land use change, carbon dioxide removals and storage in various carbon pools, biogenic products and products from technological CO_2 removals across the value chain.

More information about the guidance is available on the GHGP's website.

Reporting landscape
GHGP requirements and relief

As shown in the following table, each framework leverages the requirements and guidance of the GHGP in a different way. However, the commonality is that both frameworks include their own requirements in terms of 'what' to measure and leverage the GHGP for 'how' to measure GHG emissions.

ISSB	ESRS
An entity uses the GHGP to measure emissions, subject to relief in specific circumstances.[1] An entity uses: • the Corporate Standard (2004 version) to measure GHG emissions; and [IFRS S2.29(a)(ii)] • the Scope 3 Standard (2011) to disclose information about the categories included. [IFRS S2.29(a)(vi)] An entity applies the requirements in the Corporate Standard only to the extent they do not conflict with the requirements of IFRS S2. [IFRS S2.B23]	An entity considers the principles, requirements, guidance and provisions in the following: • Corporate Standard (2004 version); [ESRS E1.AR39(a)] • Scope 2 Guidance (2015 version); and [ESRS E1.AR45(a)] • Scope 3 Standard (2011 version). [ESRS E1.AR46(a)] For Scope 3 screening and category disclosures, an entity may consider the relevant requirements for the quantification of indirect GHG emissions in ISO 14064-1. [ESRS E1.AR46(a), AR46(c)]

ISSB	ESRS
Note 1: There is relief from using the GHGP if jurisdictions require the use of an alternate methodology. [IFRS S2.29(a)(ii)] However, an entity is required to apply the Scope 3 measurement framework in IFRS S2 to prioritize inputs and assumptions even when the entity is required by a jurisdictional authority to use a method other than the GHGP for measuring its GHG emissions. [IFRS S2.B41] In addition, entities currently using an alternative method by choice are given a temporary transition relief of one year from using the GHGP. [IFRS S2.C4(a)]	

Question 2.3.30

What are the generally accepted GHG accounting principles?

Interpretive response: Generally accepted GHG accounting principles guide the accounting and reporting of GHG emissions so that reported information represents a 'true and fair' account of an entity's GHG emissions. These principles are derived in part from generally accepted financial accounting and reporting principles. [GHGP pp 6-7]

Excerpt from GHGP Corporate Standard [p 7]

GHG accounting and reporting shall be based on the following principles:

RELEVANCE	Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
COMPLETENESS	Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
CONSISTENCY	Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.

TRANSPARENCY	Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
ACCURACY	Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

There can be significant differences in emission sources, activities and operations across all corporate emissions inventories. The GHGP does not seek to anticipate or address the array of uniquely complex situations that may arise. Instead, its principles are intended to guide judgmental decisions so that the outcomes are unbiased, relevant to end users and transparently communicated.

It may not always be possible to apply all the principles equally. For example, an entity may sacrifice some level of accuracy to develop a more complete inventory, or vice versa. Decisions like this are guided by the entity's reasons for developing the inventory.

Question 2.3.40
How are GHG emissions estimated?

Interpretive response: GHG emissions may be measured using direct emissions measurement – e.g. source-specific emission tests or continuous emissions monitoring. Because this method does not require the use of estimates, there is minimal uncertainty. However, this method is not always feasible – e.g. it may be unavailable or prohibitively expensive. As a result, it is common for emissions to be estimated.

Within each of the three scopes outlined in the GHGP, there are activities (e.g. electricity consumption, transportation) that contribute to the release of GHGs. The underlying data for these activities (e.g. meter invoice, mileage record) is unique to each activity type. For example, a meter invoice might show MWh of electricity usage and a mileage record might show the types of vehicles and the actual distance traveled.

To make varied activities comparable (e.g. convert different units of measure), GHG emissions are estimated by applying an emission factor to the corresponding activity data.

An emission factor is a calculated ratio (e.g. MWh per metric tonne (mt) of CO_2) relating GHG emissions to a proxy measure of activity (e.g. tonnes of fuel consumed, tonnes of product produced) at an emission source. [GHGP p 42]

The formula to estimate emissions of a certain GHG for a certain activity is:

Metric tonnes (mt) of gas = Activity data × Emission factor

Example 2.3.10
Direct measurement of GHG emissions

Power Generator directly measures scope 1 CO_2 emissions at its facilities using a continuous emissions monitoring system that continuously measures CO_2 emitted into the atmosphere.

The use of this system relieves the need for Power Generator to gather activity data and emission factors for calculating the scope 1 emissions CO_2 at those facilities.

Question 2.3.50
How are emissions from different GHGs reported in a comparable way?

Interpretive response: To make the various GHGs (e.g. CH_4, N_2O) comparable for reporting purposes, the concept of carbon dioxide equivalent (CO_2e) was introduced. This is a measure that converts amounts of other GHGs to the equivalent amount of carbon dioxide (CO_2). The conversion factor is known as Global Warming Potential (GWP).

GWP reflects the varied ability of GHGs to trap heat in the atmosphere. Each GHG is assigned a GWP representative of its heat trapping ability relative to that of CO_2. A higher GWP value means that more infrared radiation will be absorbed by the gas and more energy will be added to the atmosphere, leading to more warming.

The formula to calculate reported emissions is as follows:

tCO_2e = Metric tonnes of a gas × GWP of the gas

Metric tonnes of each gas is used for consistency purposes.

GWP values are determined by the IPCC. See Question 5.2.30.

Question 2.3.60
What is a GHG inventory?

Interpretive response: A GHG inventory is in effect a listing (or accounting) of all GHG emissions within an entity's inventory boundary. As illustrated in the

roadmap diagram in the executive summary, an entity's inventory boundary comprises:

- all GHG emissions within its organizational boundary (see section 3.2); plus
- GHG emissions outside its organizational boundary that it elects to include in its broader operational boundary (see section 4.2).

The purpose of a GHG inventory is to enable decision-making that supports the entity's GHG objectives. An entity may have one or many objectives for developing a GHG inventory. The following are some examples: [GHGP p 10]

- manage GHG risks and identify reduction opportunities;
- strengthen stakeholder relationships by reporting and participating in voluntary GHG programs;
- meet mandatory reporting requirements; and/or
- participate in GHG markets, whether mandatory or voluntary.

Developing a GHG inventory is a judgmental process guided by the GHG principles and the entity's GHG objectives. If an entity has multiple GHG objectives, it may need to consider whether the GHG inventory should be tailored to each objective.

Question 2.3.70

How does the GHGP fit into the current climate reporting ecosystem?

Interpretive response: The GHGP is a universal language supporting the development of multi-purpose GHG inventories. Because it has been incorporated (either directly or indirectly) into many sustainability-related reporting frameworks and regulations, a GHGP-aligned inventory is often a key first step on any sustainability reporting journey.

An increasingly common objective for preparing a GHG inventory is to satisfy voluntary or regulatory reporting requirements. The GHGP is the nexus of climate-related reporting, providing a common thread that underlies various forms of reporting.

While this handbook discusses the core concepts in developing a GHGP aligned corporate emissions inventory, it also identifies where additional considerations may be necessary depending on the ultimate use of the inventory – e.g. for voluntary or regulatory reporting purposes.

The California climate laws require reporting GHG emissions in accordance with the GHGP. Read KPMG Hot Topic, Effective dates near for California climate laws.

In addition, throughout this handbook, we briefly identify the relationship or links between the GHGP and the following:

- **IFRS S2**, Climate-related Disclosures
- **ESRS E1**, Climate change.

2.4 Project accounting

Question 2.4.10
What is GHG project accounting?

Interpretive response: GHG project accounting is the quantification and reporting of GHG reductions from climate change mitigation projects (GHG projects). Such projects can result in: [GHGP PA p 5]

- decreases in GHG emissions – e.g. using wind, solar and geothermal energy sources as alternatives to natural gas or coal power plants; or
- increases in removals and/or storage of GHG emissions – e.g. planting forests to absorb GHG emissions and sequestering carbon in underground storage.

The GHGP Project Standard provides guidance on this kind of accounting, which is separate and distinct from the accounting for GHG inventories that is the focus of this handbook. However, project accounting is a key component of emissions reductions programs and its role is discussed in section 10.2.

Question 2.4.20
What are the GHG project accounting principles?

Interpretive response: The same principles that underpin GHG corporate inventories (see Question 2.3.30) also guide decision-making in the accounting, quantification and reporting of project-based GHG reductions. These principles are relevance, completeness, consistency, transparency and accuracy. [GHGP PA pp 23-24]

GHG project accounting also incorporates the added principle of 'conservativeness', which calls for the use of conservative assumptions, values and procedures where uncertainty is high. The intention of this principle is that GHG reductions are not overestimated. [GHGP PA p 24]

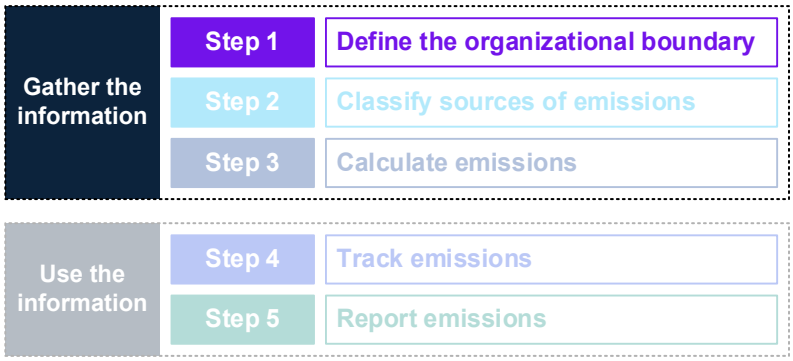
3. Organizational boundary

Detailed contents

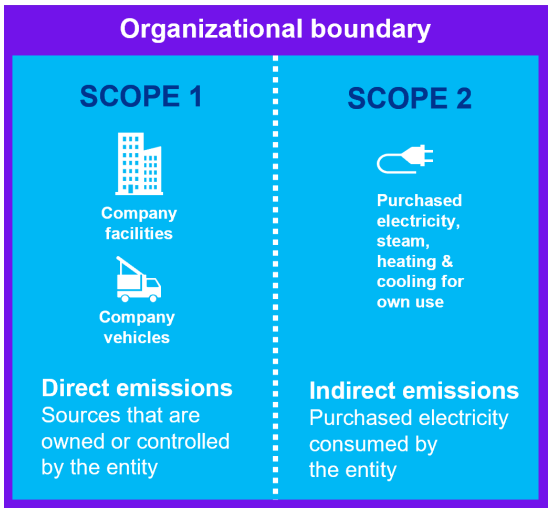
Item significantly updated in this edition #

3.1 How the GHGP works

The first step toward reporting emissions is to determine the organizational boundary.



The organizational boundary is equivalent to the 'reporting entity' concept in preparing a set of financial statements. Once that boundary has been determined, the sources of emissions to be reported can be identified. The following excerpt from the roadmap diagram in the executive summary highlights the organizational boundary as framing the scopes 1 and 2 emissions that fall into the overall inventory boundary.



In setting an organizational boundary, the GHGP allows an entity-level selection of a control approach or an equity share approach. Within the control approach, there is a further option of a financial control or operational control approach.

These approaches drew on accounting standards in effect when the GHGP Corporate Standard was developed. However, they cannot simply be equated to the application of financial reporting standards even though the terms are very familiar.

3.2 Determining the organizational boundary

Question 3.2.10
What is the organizational boundary?

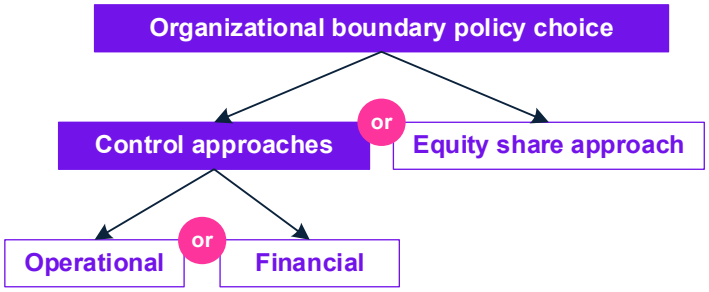
Interpretive response: The organizational boundary determines which emission-producing activities are owned or controlled by the entity and therefore included in reporting its scopes 1 and 2 emissions. [GHGP p 100]

It is equivalent to the 'reporting entity' concept in preparing financial statements.

In setting an entity's organizational boundary, the GHGP allows three choices (see Question 3.2.20). The choice made by an entity is equivalent to an accounting policy election in preparing financial statements.

Question 3.2.20
What approaches are available in setting the organizational boundary?

Interpretive response: In setting an organizational boundary, the GHGP allows an entity-level selection of a control approach or an equity share approach. Within the control approach, there is a further option of a financial control or operational control approach. [GHGP p 17]



Under the control approaches (operational or financial), an entity accounts for 100% of the emissions over which it has control and does not account for any of the emissions over which it does not have control. Under the equity share approach, an entity reflects the GHG emissions consistent with its percentage of economic interest. [GHGP p 17]

These approaches drew on accounting standards in effect when the GHGP Corporate Standard was developed. There are two factors that contribute to the fact that these approaches cannot simply be equated to the application of financial reporting standards even though the terms are very familiar. First, the standards in effect when the Corporate Standard were developed are different from the standards in place today (not least under IFRS Accounting Standards

and US GAAP. Second, the guidance developed by the GHG has largely been applied outside of the finance profession. See section 3.3.

The following table depicts key considerations under each approach. [GHGP pp 17-18]

	Control		
	Operational	Financial	Equity share
Include operations…	over which the entity has full authority regarding operating policies.	if the entity can direct the policies with a view to gaining economic benefits.	based on the entity's share of economic interest.
Key question	Does the entity introduce and implement the underlying operating policies?	Can the entity direct financial and operating policies of the operation?	Does the entity have significant influence or financial control over the operation's policies?

An entity may have operational control even though it does not have financial control. For example, an entity may have operational control over an equity accounted investee over which it does not have financial control.

Having operational control does not imply that an entity has the authority to make all decisions concerning an operation – e.g. large capital expenditures. Often, decisions will require approval from parties with financial control. However, operational control does mean that an entity has the authority to introduce and implement *operating* policies. [GHGP p 18]

Under the equity share approach, the economic substance of an entity's connection to the business takes precedence over its formal ownership structure, such that the emissions accounted for reflects the entity's economic interest. [GHGP p 17]

Question 3.2.30
How are the financial and operational control approaches applied when there is joint financial control?

Interpretive response: The financial and operational control approaches are applied differently when joint financial control exists over an operation. [GHGP p 18]

- When the financial control approach is applied, an entity accounts for its emissions based on the equity share approach – i.e. based on its economic interest.
- However, when the operational control approach is applied, an entity assesses if it has operational control to determine if the operation should be included in the organizational boundary – i.e. an all-or-nothing approach. If no party with joint financial control has operational control in its own right,

none of the jointly controlling partners report any emissions from the operation.

Example 3.2.10
Reporting joint venture emissions

Owner 1 and Owner 2 each have 50% ownership interest and joint financial control in Joint Venture.

The following table illustrates how Joint Venture's emissions are reported in three scenarios.

Scenario	Owner 1	Owner 2
Equity share or financial control approach	50%	50%
Operational control approach; Owner 1 has operational control	100%	0%
Operational control approach; neither Owner has operational control	0%	0%

Because each entity chooses its own approach, double counting can occur (see Question 3.2.60).

Question 3.2.40
How is the organizational boundary approach chosen?

Interpretive response: Entities have flexibility in choosing an organizational boundary approach. The decision generally aligns with the entity's objectives in applying the GHGP (see Question 2.3.60), but there is no specific requirement.

Because the approach supports the entity's intended GHG inventory applications, it is important to understand upfront the type of information needed from the inventory. The best approach is one that allows an entity to analyze its emissions in a way that is consistent with its reasons for conducting the inventory in the first place – e.g. reporting requirements.

To meet different goals, an entity may develop more than one inventory using different approaches. However, it is not appropriate to mix approaches in a single inventory. Consistent application of a single approach leads to time-series consistency (see chapter 9) and reduces (but does not eliminate) the likelihood of double counting amongst multiple entities with a shared asset (see Question 3.2.60).

Question 3.2.50
Which boundary approach is most common in practice?

Interpretive response: In our experience, the operational control approach is most common. Usually, operational control is chosen when an entity believes it is most responsible for emissions within its operational control. An entity may also believe these are the operations where it has the most influence over reducing emissions.

Question 3.2.60
Does the organizational boundary prevent double counting?

Interpretive response: No. Double counting occurs when two different entities include the same emissions in their respective inventories.

Although the GHGP is designed to prevent double counting of emissions between different entities within scopes 1 and 2, it can still occur in certain scenarios. For example, when two or more entities share ownership of an operation but choose different organizational boundary approaches. [GHGP p 20]

Double counting can be avoided if the entities coordinate their choice of approach, but generally this is not practical.

Avoiding double counting is important for trading schemes and certain mandatory government reporting schemes, which are outside the scope of this handbook. [GHGP p 20]

However, for many entities applying the GHGP, the goal is to accurately gather an inventory of emissions to facilitate a strategy to reduce them. Therefore, double counting between entities is often less important.

Example 3.2.20
Double counting emissions

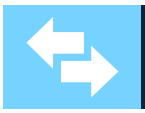
Hotelier and Partner both have ownership in Hotel with a 60%, 40% ownership structure. Hotelier also has operational control over Hotel, which had GHG emissions of 20,000 tCO_2e during the year.

The organizational boundary approach chosen by Hotelier is operational control, and therefore it includes 100% of Hotel's emissions in its inventory. Partner chooses the equity share approach and it includes 40% of Hotel's emissions.

Both entities are accounting for Hotel's emissions, which means that 140% of Hotel's emissions are being recognized. Therefore, Hotel's emissions are

double counted and overrepresented across the two entities based on their selected organizational boundary approaches.

	Hotelier	Partner	Total
Hotel ownership	60%	40%	
Operational control?	Yes	No	
Organizational boundary approach	Operational control	Equity share	
% Hotel emissions reported	100%	40%	140%
Reported emissions (tCO_2e)	20,000	8,000	28,000



Reporting landscape#
Organizational boundary

As shown in the following table, each standard deals with the organizational boundary in a different way.

ISSB	ESRS
An entity applies any of the three approaches in the GHGP – i.e. operational control, financial control or equity share approach. [IFRS S2.B27] An entity discloses its chosen approach, the reasons for that choice and how it enables an understanding of the entity's performance in relation to climate-related risks and opportunities, including progress toward any climate-related targets. [IFRS S2.27, B27(a)-(b)]	Unlike any of the approaches in the GHGP, an entity's organizational boundary consists of: • the consolidated accounting group (the parent and subsidiaries); and [ESRS E1.50(a)] • any other sites, assets or undertakings (including associates or joint ventures) under operational control [ESRS E1.50(b), AR40, EFRAG IG2.59] For investees and joint arrangements for which the entity does not have operational control, their scopes 1, 2 and 3 GHG emissions are included in the entity's scope 3 emissions to the extent they are part of the entity's value chain. [ESRS E1.AR46(h)(iii)]

3.3 Comparison to financial reporting

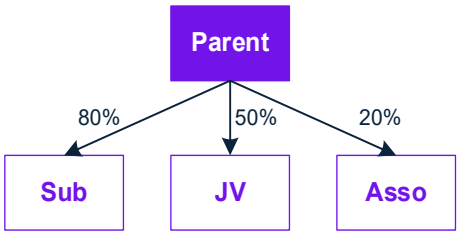
Question 3.3.10
Do the organizational boundary approaches align with the reporting entity for financial statement purposes?

Interpretive response: It depends. The descriptions of operational control, financial control and equity share in the GHGP may vary from the definitions used in financial reporting standards. While there could be alignment between the consolidation approach used for emissions accounting and the financial statements, this outcome would be more by coincidence than design, and an analysis of an entity's circumstances would be required.

Example 3.3.10
Organizational boundary approaches

Scenario 1: Single-level consolidation

Parent has the following ownership interests in Subsidiary, Joint Venture and Associate (or equity method investee).



These investees are classified as follows in the financial statements and for purposes of the GHGP.

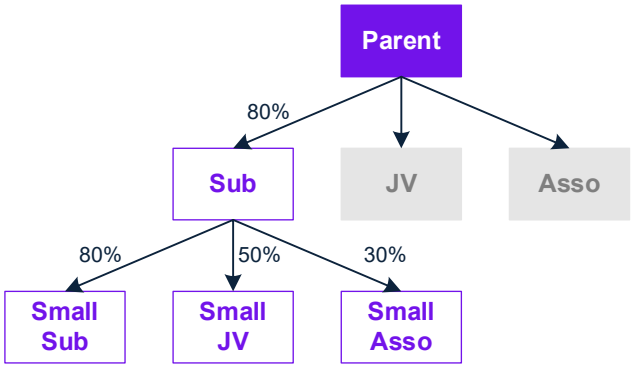
	Sub	JV	Asso
Ownership interest	80%	50%	20%
Financial statement classification	Subsidiary	Joint venture	Associate
GHGP entity type	Subsidiary	Joint venture	Associate
Operational control?	Yes	No	Yes

Parent accounts for GHG emissions from each investee differently depending on the chosen organizational boundary approach.

Approach	Sub	JV	Asso
Equity share	80%	50%	20%
Financial control	100%	50%	0%
Operational control	100%	0%	100%

Scenario 2: Multi-level consolidation

Parent also has an ownership interest in Small Subsidiary, Small Joint Venture and Small Associate (or equity method investee) through Subsidiary.



These additional investees are classified as follows in the financial statements and for purposes of the GHGP.

	Small Sub	Small JV	Small Asso
Subsidiary's ownership interest	80%	50%	30%
Financial statement classification	Subsidiary	Joint venture	Associate
GHGP entity type	Subsidiary	Joint venture	Associate
Operational control?	Yes	Yes	No

From the perspective of Parent, the following GHG emissions for the investees would be reported under each organizational boundary approach.

Approach	Small Sub	Small JV	Small Asso
Equity share[1]	64%	40%	24%
Financial control	100%	50%	0%
Operational control	100%	100%	0%

Note:

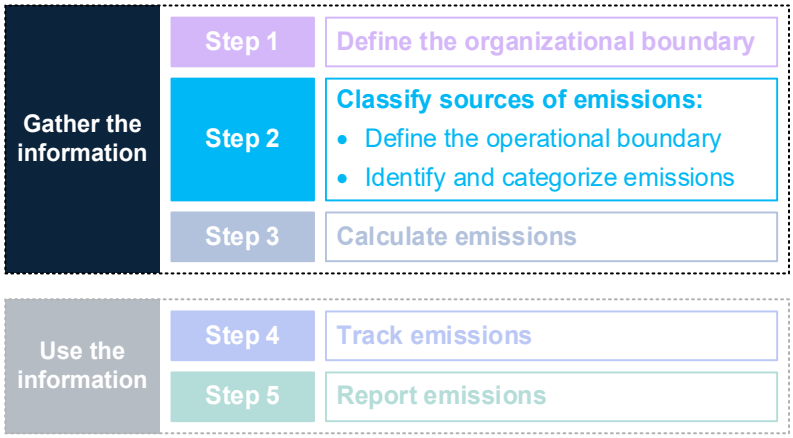
1. The equity share portion of emissions is calculated as Parent's ownership interest of Subsidiary (80%) multiplied by each of the Subsidiary's ownership interests – Small Sub (80%), Small JV (50%) and Small Asso (30%).

4. Operational boundary

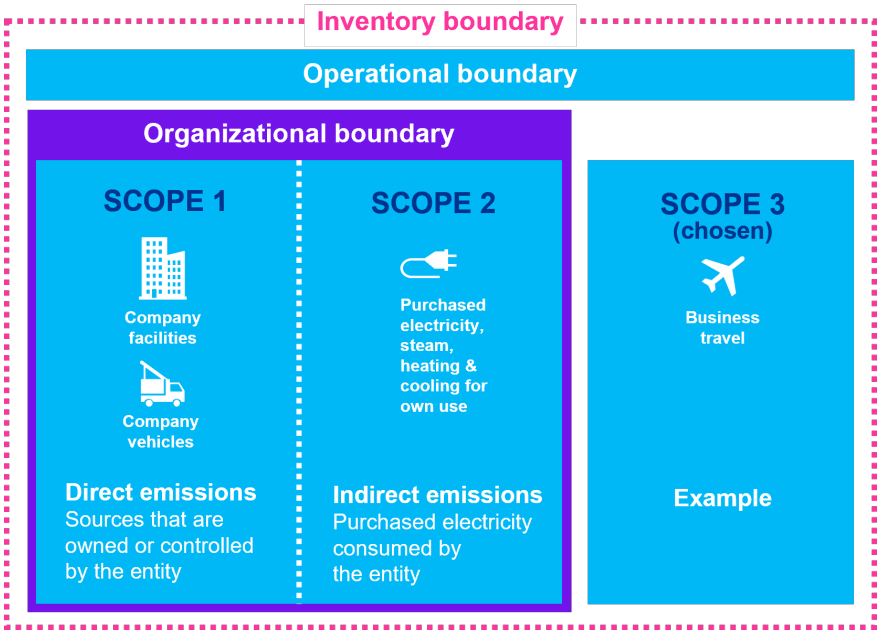
Detailed contents

4.1 How the GHGP works

The second step toward reporting emissions comprises two parts. This chapter discusses the operational boundary, while chapters 6 to 8 discuss scopes 1, 2 and 3 emissions.



The operational boundary comprises all sources of emissions within the organizational boundary plus scope 3 categories at the discretion of the entity. The following excerpt from the roadmap diagram in the executive summary illustrates business travel (but not the other scope 3 categories) being included in the operational boundary. Together, the organizational boundary and the operational boundary are called the inventory boundary.



4.2 Determining the operational boundary

Excerpt from GHGP Corporate Standard [p 26]

Setting operational boundaries

An operational boundary defines the scope of direct and indirect emissions for operations that fall within a company's established organizational boundary. The operational boundary (scope 1, scope 2, scope 3) is decided at the corporate level after setting the organizational boundary. The selected operational boundary is then uniformly applied to identify and categorize direct and indirect emissions at each operational level. The established organizational and operational boundaries together constitute a company's inventory boundary.

Question 4.2.10
What is the operational boundary?

Interpretive response: The operational boundary determines the direct and indirect emissions associated with operations owned or controlled by the entity. The entity identifies which operations and sources cause direct (see Question 4.2.30) and indirect emissions (see Questions 4.2.40 and 4.2.50) and decides which indirect (scope 3) emissions to include. [GHGP p 100]

Once an entity has determined its organizational boundary (see section 3.2), it then:

- defines its operational boundary – i.e. determines which, if any, scope 3 emissions to include in its emissions inventory; and
- identifies and categorizes the emissions-generating activities to include in its scope 1, 2 and 3 emissions.

Question 4.2.20
What is the inventory boundary?

Interpretive response: As illustrated in the roadmap diagram in the executive summary, an entity's inventory boundary comprises:

- all GHG emissions within its organizational boundary (see chapter 3); plus
- GHG emissions outside its organizational boundary that it elects to include in its broader operational boundary.

The inventory boundary may vary from entity to entity depending on the scope 3 categories the entity elects to include in its operational boundary.

Question 4.2.30
What are direct GHG emissions?

Interpretive response: Direct GHG emissions are emissions from sources that are owned or controlled by the entity. These are known as scope 1 emissions. See section 6.2. [GHGP p 25]

Question 4.2.40
What are indirect GHG emissions?

Interpretive response: Indirect GHG emissions are emissions that are a consequence of the activities of the entity but occur at sources owned or controlled by another entity. Indirect GHG emissions are further subdivided into scope 2 and scope 3. [GHGP p 25]

- **Scope 2** accounts for indirect emissions from the consumption of purchased or acquired electricity, heat, steam or cooling (see section 7.2). [GHGP S2 p 34]
- **Scope 3** includes all emissions not within an entity's scopes 1 and 2 organizational boundary but within the entity's value chain. Scope 3 emissions are identified as upstream or downstream emissions. [GHGP S3 p 29]
  - **Upstream** emissions are indirect GHG emissions related to the purchase of goods and/or services.
  - **Downstream** emissions are indirect GHG emissions related to the use of products and/or services.

The GHGP Scope 3 Standard categorizes scope 3 emissions into 15 distinct categories. The categories are designed to be mutually exclusive, resulting in no double counting between categories or scopes 1 and 2 emissions.

The following table is a list of the 15 categories. [GHGP S3 p 32]

Upstream	Downstream
1. Purchased goods and services	9. Downstream transportation and distribution
2. Capital goods	10. Processing of sold products
3. Fuel- and energy-related activities (not included in scope 1 or 2)	11. Use of sold products
4. Upstream transportation and distribution	12. End-of-life treatment of sold products
5. Waste generated in operations	

Upstream	Downstream
6. Business travel	13. Downstream leased assets
7. Employee commuting	14. Franchises
8. Upstream leased assets	15. Investments

Chapter 8 discusses each category.

Question 4.2.50

How is the operational boundary chosen?

Interpretive response: An entity determines, on the basis of its business goals and obligations, whether to account for: [GHGP p 25]

- scope 1 and scope 2 emissions only; or
- some or all of the scope 3 categories relevant to its operations in addition to its scopes 1 and 2 emissions (see Question 4.2.60).

Question 4.2.60

Which scope 3 categories are included in the operational boundary?

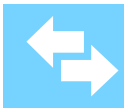
Interpretive response: Absent a reporting (e.g. regulatory) requirement, the following steps may guide an entity in determining which scope 3 categories to include in its inventory. [GHGP pp 30-31]

1. Understand the value chain and identify the associated GHG sources.
2. Determine which scope 3 categories are relevant in terms of size, contributions to GHG risk exposure, stakeholder attention or potential emissions reductions.
3. Identify partners that contribute potentially significant amounts of GHGs along the value chain – e.g. customers, product manufacturers, energy providers.
4. Quantify scope 3 emissions – e.g. estimate the relative magnitude to support an entity in selecting the categories to include in its inventory boundary. See chapter 8.

To determine which scope 3 categories to include in the inventory, the entity may consider reporting requirements or relevance of categories in terms of size, risk exposure, stakeholder attention or potential emissions reductions. Data availability and reliability is also a consideration. The GHGP does not provide any materiality threshold that allows for the exclusion of emissions from any particular source or activity. In our experience, given the possibility of insufficient data quality (e.g. due to lack of data or prohibitive cost of gathering data), entities need to find the balance between inventory quality and completeness.

In our experience, common scope 3 categories included in corporate GHG inventories are purchased goods and services (category 1), business travel (category 6) and employee commuting (category 7). In particular, categories 6 and 7 represent a common starting point for many entities because the underlying activity data tends to be more readily available and easily accessible than some of the other categories. The categories that represent the greatest risks and priorities will vary by sector.

The example in Appendix B illustrates how select scope 3 categories might be presented.



Reporting landscape
Scope 3 categories

As shown in the following table, each framework deals with scope 3 disclosures differently.

ISSB	ESRS
An entity discloses which of the 15 categories of emissions as defined in the Scope 3 Standard are included in its scope 3 emissions. [IFRS S2.29(a)(vi)] The categories included will depend on the entity's facts and circumstances. The entity is required to consider the relevance of all 15 categories. [IFRS S2.B32, BC110]	An entity discloses each significant scope 3 category. [ESRS E1.51] The assessment of significance is based on the magnitude of estimated GHG emissions and other criteria such as financial spend, influence, related transition risks and opportunities, or stakeholder views. [ESRS E1.AR46(d)] An entity discloses a list of included and excluded scope 3 emissions with justification for excluded categories. [ESRS E1.AR46(i)]

Example 4.2.10
Choosing an operational boundary (within scope 3)

Hotel has already identified the emissions-generating activities to include in its operational boundary for the purposes of determining scopes 1 and 2 emissions. Hotel is now determining the categories of scope 3 emissions to include in its operational boundary.

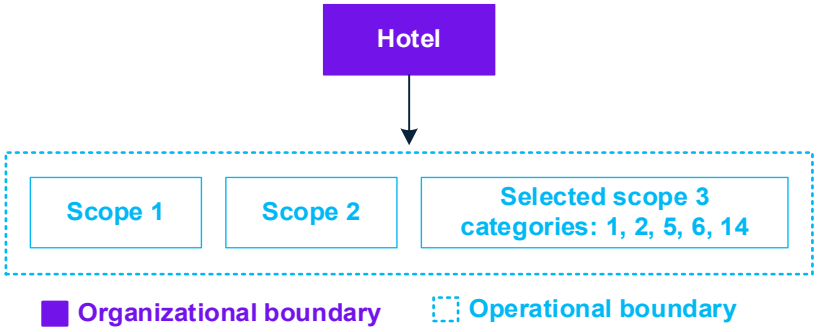
Hotel prioritizes scope 3 data collection efforts toward activities expected to have the most GHG emissions and offer the highest reduction opportunities. Based on its value chain understanding, Hotel ranks each scope 3 activity from highest expected emissions to lowest expected emissions.

In addition to the expected amount of emissions, Hotel uses the following factors to help determine which scope 3 categories to voluntarily include in its inventory boundary.

- Higher priority scope 3 emissions sources are those Hotel could influence reductions through:
  - changes to sourcing decisions and using fewer resources – e.g. switching vendors for purchased goods, services and capital goods;
  - product design changes – e.g. switching shampoo containers from small disposable plastic bottles to large refillable pumps; or
  - employee incentive programs – e.g. business travel, commuting.
- Lower priority scope 3 emissions sources are sources that are extraneous to Hotel's corporate emissions goals.

As a result of its assessment, Hotel selects the following scope 3 categories to include in its inventory because it has the greatest ability to influence reductions in these areas:

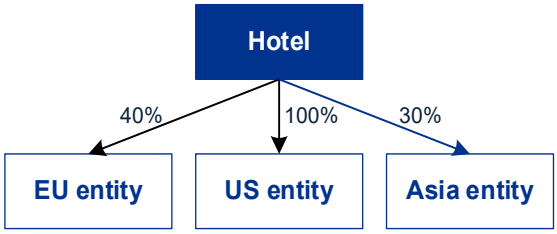
- Category 1: Purchased goods and services
- Category 2: Capital goods
- Category 5: Waste generated in operations
- Category 6: Business travel
- Category 14: Franchises.



Example 4.2.20
Relationship between the organizational and operational boundaries

Hotel has the following ownership interest in three investees.

- Hotel has a 100% ownership interest in the US entity.
- The EU and Asia entities are operated by an affiliated luxury brand.

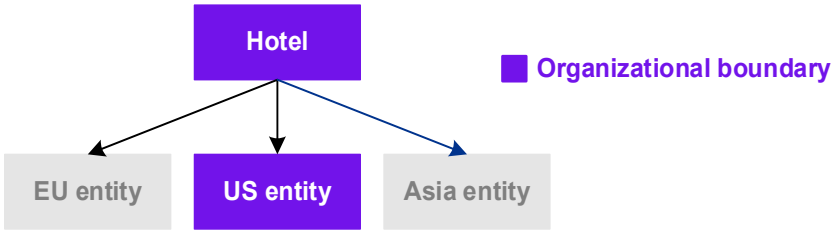


To develop its GHG inventory boundary, Hotel first defines its organizational boundary, then defines its operational boundary and finally identifies the relevant emissions to include.

Step 1: Organizational boundary

Hotel determines its organizational boundary using the operational control approach (see section 3.2).

- Hotel has operational control over the US entity and therefore includes it in its organizational boundary.
- Hotel does not have operational control over the EU or Asia entities and therefore does not include them in its organizational boundary.



Step 2(a): Operational boundary

Hotel is required to include scopes 1 and 2 emissions in its operational boundary.

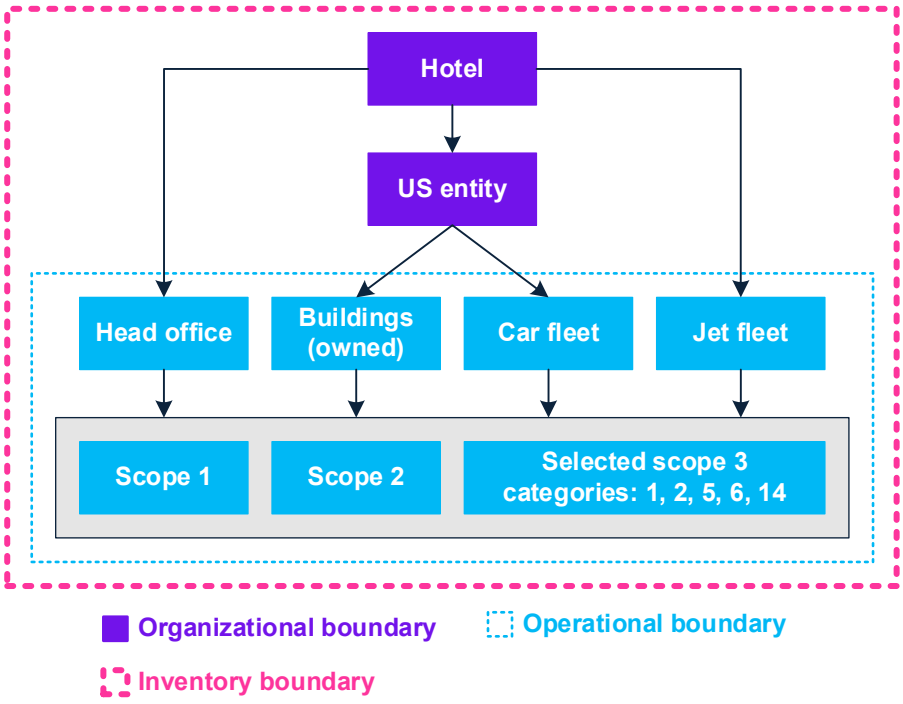
In addition, Hotel voluntarily decides to include the following scope 3 categories in its operational boundary: purchased goods and services (category 1), capital goods (category 2), waste generated in operations (category 5), business travel (category 6) and franchises (category 14).

Step 2(b): Identify and categorize emissions

Based on the organizational and operational boundaries, Hotel and the US entity have identified the following sources of emissions.

- Hotel owns and operates its head office building and a fleet of jets for executive travel.
- US entity owns and operates a building and a fleet of vehicles for employee travel.

As a result, the following depicts Hotel's operational boundary and shows the inventory boundary as the organizational and operational boundaries together.



Although EU entity and Asia entity are not part of Hotel's organizational boundary, they may be part of Hotel's value chain. For example, the EU entity sells its own branded mattresses, linens and bath products to US entity for use in its hotels. To the extent such relationships are within Hotel's selected scope 3 categories, emissions related to those relationships will be included in Hotel's operational boundary.

4.3 Contractual arrangements, including leases

Question 4.3.10
What are the operational boundary considerations for contractual arrangements?

Interpretive response: The classification of scopes 1, 2 and 3 emissions for contractual arrangements (e.g. leased assets, outsourcing, franchises) depends on the entity's chosen approach selected for setting the organizational boundary (see chapter 3). [GHGP p 31]

If, based on the chosen approach, the entity excludes certain contractual arrangements from its organizational boundary – e.g. because it has chosen the operational control approach and it does not have operational control over certain franchises – the entity may still include the emissions from those contractual arrangements in scope 3. [GHGP p 31]

Question 4.3.20
How are leasing arrangements considered within the operational boundary?

Interpretive response: To determine how emissions from leased assets are accounted for in an entity's GHG inventory, the Scope 3 Standard provides the following guidance: [GHGP S3 p124]

1. Understand the types of leases relevant to the entity – finance or capital leases, and operating leases.
2. Determine whether the emissions associated with the leased assets are categorized as scope 1, 2 or 3 by the entity.

Emissions from leased assets are only classified as scope 3 if the selected organizational approach (equity or control) does not apply to them. [GHGP p 29]

The following table, adapted from the GHGP Scope 3 Standard, illustrates leasing agreements and boundaries. [GHGP S3 pp 124-125]

	Type of leasing arrangement	
	Financial/capital lease	**Operating lease**
Equity share or financial control approach used	**Lessee** has ownership and financial control. • Emissions associated with fuel combustion are scope 1. • Emissions associated with use of purchased electricity are scope 2. **Lessor** does not have ownership or financial control. • Emissions associated with fuel combustion and use of purchased electricity are scope 3 (downstream leased assets).	**Lessee** does not have ownership or financial control. • Emissions associated with fuel combustion and use of purchased electricity are scope 3 (upstream leased assets). **Lessor** has ownership and financial control. • Emissions associated with fuel combustion are scope 1. • Emissions associated with use of purchased electricity are scope 2.
Operational control approach used	**Lessee** has operational control. • Emissions associated with fuel combustion are scope 1. • Emissions associated with use of purchased electricity are scope 2. **Lessor** does not have operational control. • Emissions associated with fuel combustion and use of purchased electricity are scope 3 (downstream leased assets).	**Lessee** has operational control. • Emissions associated with fuel combustion at sources in the leased space are scope 1. • Emissions associated with use of purchased electricity are scope 2.[1] **Lessor** does not have operational control. • Emissions associated with fuel combustion and use of purchased electricity are scope 3 (downstream leased assets).[2]

Notes:

1. If an entity is able to demonstrate that it does not have operational control over a leased asset held under an operating lease, it may report emissions from the leased asset as scope 3, with appropriate disclosure.
2. If an entity is able to demonstrate that it has operational control over an asset leased to another entity under an operating lease, it may report emissions from fuel combustion as scope 1 and emissions from the use of purchased electricity as scope 2, with appropriate disclosure.

In our experience, there is some diversity in practice regarding the interpretation of this guidance, not least because the leasing standards under both IFRS Accounting Standards and US GAAP (IFRS 16 and ASC 842, respectively) have been updated and leases (subject to some exceptions) generally are now on-balance sheet.

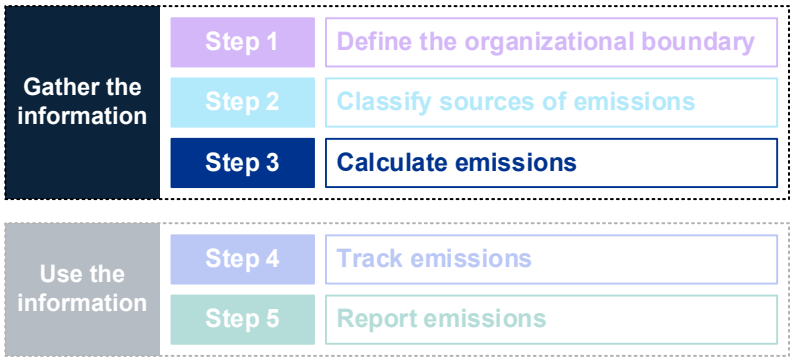
5. Emissions calculations

Detailed contents

New item added in this edition **

5.1 How the GHGP works

The third step toward reporting emissions is to perform the calculations based on all emissions in the inventory boundary.



This chapter provides an overview of how the calculations are performed, explaining the components of the following formula:

tCO_2e	=	Activity data	×	Emission factor	×	GWP
Tonnes of CO_2 equivalent		Estimated measure of activity related to a specific emissions source		Factor applied to make varied activities comparable		Multiplier that makes different GHGs comparable

This chapter provides context for the discussion in chapters 6 to 8, which explain how to identify and measure the emissions in scopes 1 and 2, and in the 15 categories within scope 3.

5.2 Components of the calculation

Question 5.2.10
What are the steps in identifying and calculating GHG emissions?

Interpretive response: There are five steps in identifying and calculating an entity's GHG emissions. [GHGP pp 41-47]

1. Identify GHG emissions sources in the inventory boundary and categorize them as scope 1, 2 or 3 (see chapters 6 to 8). The following categories of sources typically produce GHG emissions. [GHGP p 41]

Stationary combustion	Combustion of fuels in stationary equipment – e.g. furnaces, boilers, heaters
Mobile combustion	Combustion of fuels in transportation devices – e.g. automobiles, airplanes
Process emissions	Emissions from physical or chemical processes – e.g. aluminum smelting
Fugitive emissions	Intentional and unintentional releases – e.g. equipment leaks

2. Select a calculation approach – e.g. direct measurement or estimation using an emission factor (see Question 2.3.40).
3. Collect data and choose emission factors (see Question 2.3.40).
4. Apply calculation tools – either cross-sector or sector-specific tools. [GHGP pp 42-43]
5. Roll-up individual data (e.g. facilities, countries, business divisions) to corporate level. This is done using a centralized or decentralized approach. [GHGP pp 45-47]

Question 5.2.20
What is the formula for estimating GHG emissions?

Interpretive response: When direct measurement is unavailable (see Question 2.3.40), GHG emissions (tonnes per CO_2 equivalent) are estimated for each gas within each scope using the following formula:

$$\mathbf{tCO_2e = Activity\ data \times Emission\ factor \times GWP}$$

Activity data is the estimated measure of activity related to a specific emissions source, and emission factors are applied so that varied activities can be compared.

Emission factors may be provided in various units – e.g. pounds CO_2 per MWh, kilograms of CO_2 per mile. Therefore, there may be an additional step in this calculation that involves a conversion factor – e.g. to convert pounds to tonnes.

These concepts are discussed in relation to each scope or category (scope 3) in the following sections or Questions.

	Activity data	Emission factors
Scope 1	Section 6.2	Section 6.2
Scope 2	Question 7.2.40	Question 7.2.50
Scope 3	Question 8.2.40	Question 8.2.50

Questions 2.3.50 and 5.2.40 discuss the selection of GWP values, which convert different GHGs into the equivalent of CO_2. GWP values are determined by gas regardless of scope.

Example 5.2.10
Estimating emissions

Hotel determines there are sources within its organizational boundary that emit direct emissions of CO_2, CH_4 and N_2O. Hotel estimates total scope 1 emissions using the following formula.

Gas	Activity Data		Emission Factor		GWP		Total
CH_4	AD	×	EF	×	GWP	=	tCO_2e
							+
CO_2	AD	×	EF	×	GWP	=	tCO_2e
							+
N_2O	AD	×	EF	×	GWP	=	tCO_2e
							=
					Total Scope 1		**tCO_2e**

Hotel repeats this formula to estimate emissions for scope 2 (market-based and location-based) and scope 3 (for each category within its chosen operational boundary).

Question 5.2.30
What is a GWP value?

Interpretive response: To reflect the varied ability of GHGs to trap heat in the atmosphere, each GHG is assigned a GWP representative of its heat trapping ability relative to CO_2 (which has a GWP of 1).

A higher GWP value means that more infrared radiation will be absorbed by the gas and more energy will be added to the atmosphere, leading to more warming. For example, in the sixth IPCC assessment report, the 100-year GWP was 27 for CH_4 (non-fossil), 29.8 for CH_4 (fossil) and 273 for N_2O. This is because both gases trap more heat than CO_2 and N_2O traps more than CH_4.

By assigning GWP values, the emissions impacts of different GHGs are comparable.

GWPs are calculated over certain time periods, typically 20, 100 and 500 years.

As updated scientific estimates become available, the IPCC periodically updates GWP values with each of its scientific assessment reports. The following table summarizes a timeline of the IPCC's assessment report updates and where the GWP values can be found within each report.

Assessment report	Report title	Reference to GWP table
Sixth	Climate Change 2021: The Physical Science Basis	Chp 7, Table 7.15
Fifth	Climate Change 2013: The Physical Science Basis	Chp 8, Table 8.A.1
Fourth	Climate Change 2007: The Physical Science Basis	Chp 2, Table TS.2
Third	Climate Change 2001: The Scientific Basis	Chp 6, Table 6.7
Second	Climate Change 1995: The Science of Climate Change	Chp 2, Table 2.9

For each IPCC assessment report, there is a corresponding synthesis report intended to synthesize and integrate materials contained in the assessment reports and other special reports. The Sixth Synthesis Report was released in March 2023.

Question 5.2.40
Which GWP values are used?

Interpretive response: The GHGP provides the following guidelines on choosing GWP values. [GHGP G p 1]

Required

- Use 100-year GWP values from the IPCC
- Use GWPs from a single assessment report for any one inventory
- Report the source of the GWP values

Encouraged

- Use GWP values from the most recent assessment report – currently the sixth assessment report
- Use the same GWPs for the current inventory period and the base year

In applying the GHGP, entities may deviate from the above if necessary. For example, if GWPs for a particular gas are not provided in the chosen assessment report, the entity may find it necessary to use multiple reports. Disclosure of GWP values is required (see Appendix A).

Entity usage of GWP values may depend on jurisdictional requirements.

Reporting landscape
GWP values

As shown in the following table, both frameworks are more prescriptive than the GHGP.

ISSB	ESRS
An entity uses GWP values based on a 100-year time horizon from the latest IPCC assessment available at the reporting date. [IFRS S2.B21]	An entity uses the most recent GWP values published by the IPCC based on a 100-year time horizon. [ESRS E1.AR39(d)]

Question 5.2.50
What is uncertainty in a GHG inventory?

Interpretive response: Uncertainty is a measure of data quality. Uncertainties associated with GHG inventories can be categorized as follows. [GHGP pp 54-55]

- **Scientific uncertainty** arises when the science of the actual emission is not completely understood – e.g. GWPs involve scientific uncertainty.
- **Model estimation uncertainty** refers to the uncertainty associated with the mathematical equations used to estimate GHG emissions – e.g. statistical models.
- **Parameter estimation uncertainty** refers to the uncertainty associated with quantifying the parameters used as inputs into estimation models – e.g. activity data and emission factors.

In our experience, most entities focus on estimating parameter uncertainty because the estimation of scientific uncertainty and model uncertainty is highly technical. The GHGP has developed supplementary guidance and calculation tools to support 'uncertainty assessments'. [GHGP p 56]

These assessments provide feedback on inventory quality. By understanding the uncertainties inherent in GHG emissions data, the entity may assess appropriate use of data and identify opportunities to improve data collection.

The example in Appendix B includes disclosure related to the use of estimates and estimation uncertainties.

Question 5.2.60
Does the GHGP allow for any exclusions?

Interpretive response: Entities are required to disclose any specific exclusions of sources, facilities and/or operations from their reported emissions. [GHGP p 63]

Consistent with the completeness principle (see Question 2.3.30), an inventory includes all relevant emissions sources within the chosen organizational boundary. Consistent with the transparency principle (see Question 2.3.30), an entity transparently documents and justifies any instances where emissions have not been estimated or are estimated at an insufficient level of quality – e.g. due to lack of data, prohibitive cost of gathering data.

If an entity is unable to obtain certain data, the entity may disclose and justify such exclusions and still report in accordance with the GHGP. See Appendix A.

Question 5.2.65**
What are the attributes to consider when selecting an emission factor?

Interpretive response: There are a number of attributes to consider when selecting an emission factor. The following are highlighted in the GHGP's Scope 3 Standard (see chapter 8) but have general applicability. [GHGP S3 p 76]

Technology	Time	Geography	Completeness	Reliability
Degree to which the emission factor reflects the actual technology used – e.g. power generated by source such as coal, solar, wind, natural gas, nuclear, biomass or hydroelectric.	Degree to which the actual time or age of the activity is represented – e.g. emission factor is current relative to current year activity.	Emission factor developed from activity in the same or similar area as the data – e.g. country or site.	Data from all relevant sites over an adequate time period to even out normal fluctuations - e.g. measurements and activity cover the full period, inclusion of all relevant emission sources, comprehensive data collection, consideration of all operational phases.	Emission factor has been developed using a reliable methodology – e.g. sound statistical and scientific review followed, peer-reviewed studies, consistency with international standards.

While the scope 2 location-based method of calculating emissions requires the use of the grid-average in the respective location of operations (see Question 7.2.50), the selection of the emission factor may still involve an evaluation of the time period of the emission factor (e.g. grid-average for a specific year, calendar quarter, month), geography (e.g. national, regional, other jurisdictional division), and whether the emission factor's development followed a process that was reliable and resulted in a complete dataset. [GHGP S2 p 47]

Example 5.2.15**
Selecting an emission factor

Hotel has multiple office locations across the US and uses eGRID emission factors to calculate its GHG emissions under the location-based method, selecting the regional eGRID emission factor relevant to each office location – Chicago and Los Angeles – for the year ended December 31, 2023. Regional information is recommended by the US EPA for accurately representing emissions from power consumed at that location.

The January 2023 eGRID data for a specific region reflects the 2021 power generation mix (e.g. coal, nuclear, hydro, solar, gas). The emission rates for the relevant regions and the national average are presented below to illustrate the impact of changing power generation mix between periods.

Hotel Location	eGRID Region *lbs/MWh of CO_2e*	January 2022	January 2023	January 2024
Chicago	RFCW	990.8	1,052.5	1,005.9

Hotel Location	eGRID Region *lbs/MWh of CO_2e*	January 2022	January 2023	January 2024
Los Angeles	CAMX	515.5	533.6	499.3
	National	822.6	857.0	827.5

By using the regional factors instead of the national average, Hotel has used an emission factor that more closely reflects the local energy power generation sources and technologies, leading to more precise and reliable reporting.

Question 5.2.70
Are the latest available emission factors required for calculating GHG emissions?

Interpretive response: We believe an entity may develop a reasonable policy for the frequency of updating the emission factors required for calculating its GHG emissions that balances the following:

- the conceptual principle of achieving sufficient accuracy to support the integrity of the reported information (see Question 2.3.30); with
- the practical need to allow sufficient time for the data required for calculations to be incorporated into the underlying systems.

Although the GHGP recommends using the latest available emission factors (data) at the date of publishing GHG emissions, it does not require them. In addition, the GHGP strives to achieve 'sufficient' rather than 'absolute' accuracy. [GHGP pp 7, 62]

Therefore, because using the latest available emission factors could result in practical difficulties – e.g. continuous monitoring for emission factor updates until the GHG report is issued – we believe an entity may develop a reasonable policy (e.g. annual update of emission factors) and apply that policy consistently.

Example 5.2.20
Updating emission factors

Hotel is calculating GHG emissions for the year ended December 31, 2023, which will be published in April 2024. Hotel has determined that EPA eGRID factors and UK BEISA emission factors are the most appropriate.

Hotel applies the following policy, which it discloses in its GHG emissions report: "Emission factors are updated in October each year based on the latest available factors."

This policy of updating emission factors in the last quarter of the year allows Hotel time to embed the latest inputs into its calculations. Practically, this means

that Hotel used the following in calculating GHG emissions for the year ended December 31, 2023.

Source	Date published	Rationale for use
EPA eGRID factors	January 2023 (based on 2021 data)	Representative of the most up-to-date inputs as of October 2023
UK BEISA emission factors	June 2023	Website indicates they should be used for calculating 2023 GHG emissions

Question 5.2.80**

Can an emission factor be used that includes additional gases and radiative forcing impacts?

Interpretive response: Yes. Aviation activities are an example of where emission factors may include direct effects from fuel consumption and additionally incorporate radiative forcing of the indirect effects of aviation (non-CO_2 emissions such as water vapor, contrails and NO_x). Emission factors with indirect effects are optional for calculating emissions from air travel or transport. [GHGP S3C p 53]

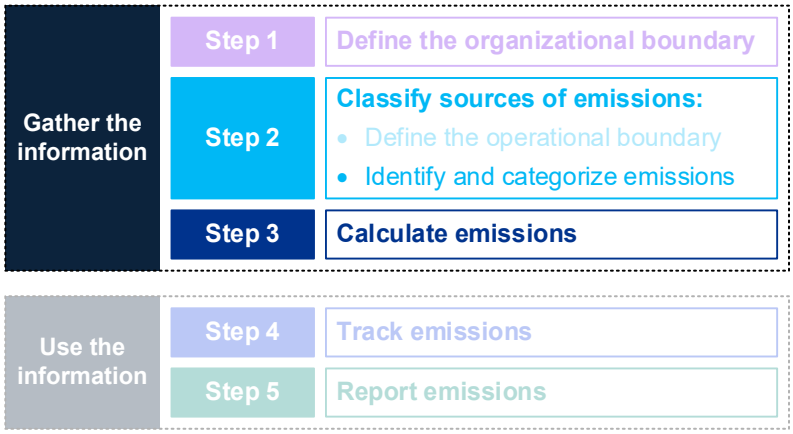
These factors may be significantly higher (e.g. by 70%) and have greater scientific uncertainty. The chosen emission factor is disclosed in following the Scope 3 Standard (see Appendix A), and if one with indirect effects is used in the base year, an emission factor of the same type is used in subsequent periods to avoid distorting emission trends; see section 9.2 on tracking emissions over time.

6. Scope 1 emissions

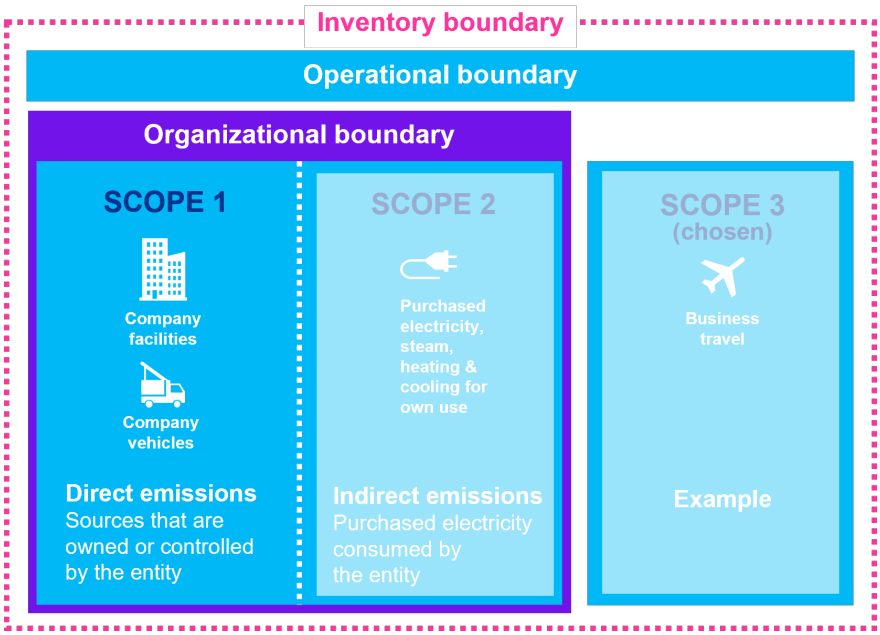
Detailed contents

6.1 How the GHGP works

Having provided an overview of how emissions are calculated in chapter 5, this chapter looks more closely at scope 1 emissions: what they are in the context of identifying and categorizing emissions (part of Step 2) and calculating emissions (Step 3).



Unlike scopes 2 and 3, scope 1 emissions are direct – i.e. they are from sources that are owned or controlled by the entity – and therefore occur within the organizational boundary.



6.2 Identifying and measuring scope 1 emissions

Question 6.2.10
What are scope 1 emissions?

Interpretive response: Scope 1 emissions are emissions from sources that are owned or controlled by the entity. They are principally the result of the following types of activities undertaken by the entity. [GHGP pp 25, 27]

Activities	Source of emissions
Generation of electricity, heat or steam	Combustion of fuels in stationary sources – e.g. boilers, furnaces, turbines
Physical or chemical processing	Manufacture or processing of chemicals and materials – e.g. cement, aluminum, waste processing
Transportation of materials, product, waste and employees	Combustion of fuels in entity-owned or controlled mobile combustion sources – e.g. trucks, trains, ships, airplanes, buses, cars
Fugitive emissions	Intentional or unintentional releases – e.g. equipment leaks from joints; HFC emissions during the use of refrigeration and air conditioning equipment; methane leakages from gas transport

Emissions associated with the sale of own-generated electricity to another entity are not deducted/netted from scope 1 (see section 7.2). [GHGP p 27]

Excerpt from GHGP Corporate Standard [p 41]

Identify scope 1 emissions

Process emissions are usually only relevant to certain industry sectors like oil and gas, aluminum, cement, etc.

Manufacturing companies that generate process emissions and own or control a power production facility will likely have direct emissions from all the main source categories.

Office-based organizations may not have any direct GHG emissions except in cases where they own or operate a vehicle, combustion device, or refrigeration and air-conditioning equipment.

Example 6.2.10
Identifying scope 1 emissions

During the year, Hotel operated one jet for executive travel. This jet operates on kerosene jet fuel, which, as it burns, emits CO_2, CH_4 and N_2O. Because this jet is owned and operated by Hotel, the emissions from the fuel burned in this asset are reported as scope 1 emissions.

Occasionally, Hotel executives travel for business on commercial jets that are not owned or operated by Hotel. Hotel includes these emissions in scope 3-category 6 (business travel). See section 8.8.

Question 6.2.20
How are scope 1 emissions calculated?

Interpretive response: Following the standard formula (see Question 5.2.20), scope 1 emissions are calculated based on activity data and emission factors. For many entities, scope 1 emissions are calculated based on the purchased quantities of commercial fuels – e.g. natural gas, heating oil. [GHGP p 42]

The Environmental Protection Agency (EPA) provides guidance on calculating scope 1 emissions related to stationary combustion, mobile combustion and fugitive emissions. Based on this guidance, an entity may gather activity data from the following sources.

Type	Description	Activity data
Stationary combustion	Fuel burned in buildings or equipment owned or operated by the entity – e.g. boilers	Fuel measurement system data, fuel purchase records – e.g. monthly utility bills
Mobile combustion	Fuel purchased for owned or leased vehicles (see Question 4.3.20) and mobile equipment – e.g. cars	Fuel type, fuel use, distance traveled, fuel economy, vehicle type, emissions control technology and/or model year
Fugitive emissions	Chemicals released from air conditioning, refrigeration or fire suppression equipment owned or controlled by the entity	Inventory records, purchase records, repair reports, service records, disposal records

The GHGP website provides calculation tools that can be used by entities at their discretion. For example, the stationary combustion tool provides default fuel and national average electricity emission factors. The mobile combustion tool provides emission factors for road, air, water and rail transport. [GHGP p 44]

Example 6.2.20
Calculating scope 1 emissions

Continuing Example 6.2.10, to calculate the scope 1 emissions associated with its corporate jet, Hotel gathers the following information.

Activity data	Per fuel receipts, the volume of fuel combusted is 120,000 gallons
Emission factor	Per the EPA, the jet fuel emission factor is 9.75 kg CO_2/gal
Calculation of CO_2 emissions	Activity data × Emission factor = tCO_2e
	120,000 gallons × 9.75 kg CO_2e/gal × 0.001 t/kg = **1,170 tCO_2e**
	Because the fuel combusted is already measured in CO_2, the GWP is 1 and therefore not included in the above formula (see Question 5.2.30). The factor applied here of 0.001 mt/kg is converting kgs to tonnes.

Hotel performs a similar calculation to determine the amount of CH_4 and N_2O emissions associated with the corporate jet. For these GHGs, Hotel adjusts the formula to multiply by the appropriate GWP to convert the CH_4 and N_2O emissions to CO_2e.

Reporting landscape
Scope 1 emissions

As shown in the following table, both frameworks require the disclosure of gross scope 1 emissions.

ISSB	ESRS
An entity discloses its gross scope 1 emissions. [IFRS S2.29(a)(i)(1)]	An entity discloses its gross scope 1 emissions. [ESRS E1.44(a)]

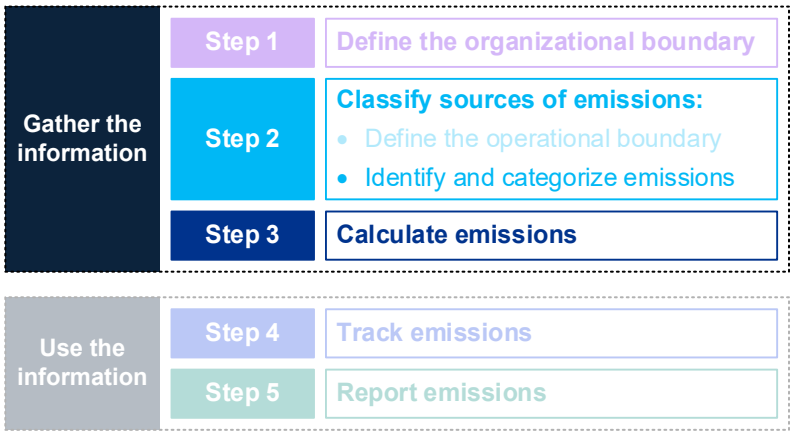
7. Scope 2 emissions

Detailed contents

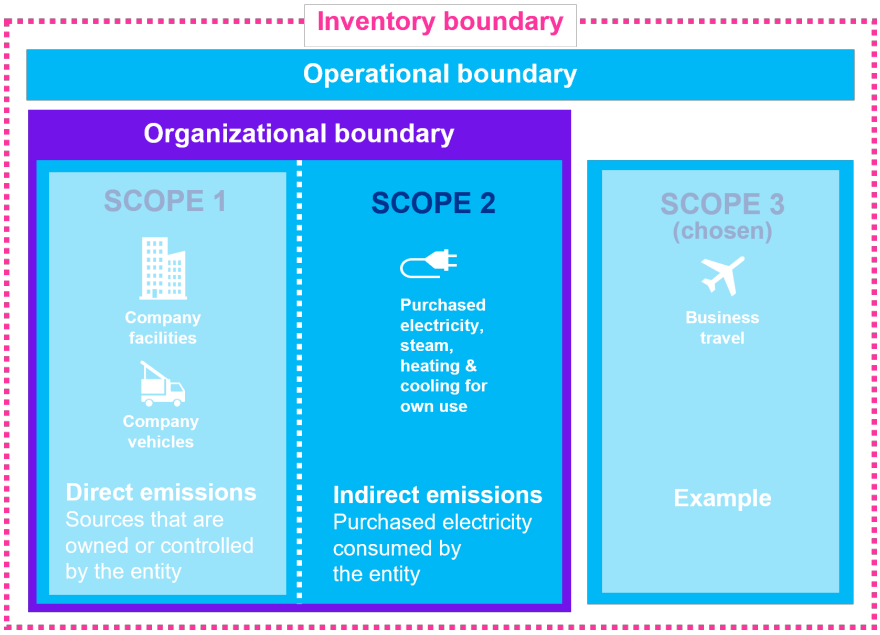
New item added in this edition **

7.1 How the GHGP works

This chapter is structured similarly to chapter 6 (scope 1 emissions). Having provided an overview of how emissions are calculated in chapter 5, this chapter looks more closely at scope 2 emissions: what they are in the context of identifying and categorizing emissions (part of Step 2) and calculating emissions (Step 3).



Like scope 1, scope 2 emissions occur within the organizational boundary. However, unlike scope 1, they are indirect emissions because they do not occur from sources that are owned or controlled by the entity. Rather, they represent purchased electricity (including steam, heat or cooling) that is generated outside the organizational boundary but consumed within the boundary.



7.2 Identifying and measuring scope 2 emissions

Question 7.2.10
What are scope 2 emissions?

Interpretive response: As defined in the GHGP, Scope 2 is an indirect emissions category that includes GHG emissions from the generation of purchased or acquired electricity, steam, heat or cooling consumed by the entity. [GHGP S2 p 34]

These emissions are considered an indirect emissions source because they are a consequence of activities of the entity but physically occur at sources owned or controlled by another entity. In other words, scope 2 captures the emissions associated with energy generated by a third-party electricity generator or utility but consumed within the entity's organizational boundary. [GHGP S2 p 6]

As noted in the GHGP, almost all entities generate indirect emissions due to the purchase of electricity for use in their processes or services. For many entities, purchased electricity represents one of the largest sources of GHG emissions. [GHGP p 27, 41]

Reporting landscape
Scope 2 emissions

As shown in the following table, both frameworks require the disclosure of gross scope 2 emissions.

ISSB	ESRS
An entity discloses its gross scope 2 emissions. [IFRS S2.29(a)(i)(2)]	An entity discloses its gross scope 2 emissions. [ESRS E1.44(b)]

Question 7.2.20
How is energy generation and distribution classified into the different scopes?

Interpretive response: Energy is either transferred via direct line transfer or the grid. There are four components of the energy grid.

- Individual generators – e.g. coal power plant, solar panel farm
- Transmission lines – e.g. power lines, underground power cables
- Distribution network – e.g. from transformers to homes and businesses
- Energy consumer.

The transmissions lines and distribution network are collectively referred to as the 'transmission and distribution' (T&D) system. The T&D system is often owned by the utility. When energy is transferred via the grid, losses may occur during T&D. [GHGP pp 27-28]

The emissions associated with the four components of the energy grid are recorded in the different scopes by the following entities.

Generator	In scope 1, the energy generator accounts for GHG emissions from energy generation.
Utility company	In scope 2, the utility accounts for GHG emissions associated with energy lost during T&D.
Consumer	In scope 2, the energy consumer accounts for GHG emissions from the consumption of energy obtained from another entity – e.g. the utility. In scope 3, an end user may also report indirect emissions associated with T&D losses (see section 8.5).

In scope 3, an entity accounts for other upstream emissions associated with the production and processing of upstream fuels – e.g. exploration, drilling, flaring. See section 8.5. [GHGP p 28]

Example 7.2.10
Accounting for emissions from the generation, sale and purchase of electricity

The following example has been adapted from the GHGP. [GHGP pp 28-29]

Generator owns a coal power generation plant and sells the electricity to Utility, a utility that owns and controls the T&D system. Hotel purchases the electricity for consumption in its own operations.

The following table illustrates how the transactions are classified into scopes 1, 2 and 3. Each of the three entities report the emissions associated with the electricity generation, but they do so in different scopes.

	Generator	Utility	Hotel
	(a power generator)	(a utility)	(energy consumer)
Transactions			
Produced	500 MWh		
Sold	-500 MWh		
Purchased		500 MWh	
Consumed		-50 MWh (T&D)	
Sold		-450 MWh	
Purchased			450 MWh
Consumed			-450 MWh

	Generator	Utility	Hotel
Reporting[1]			
Scope 1 (100 tCO_2e)	100 tCO_2e (produced)		
Scope 2 (100 tCO_2e)		10 tCO_2e (T&D)	90 tCO_2e (purchased)
Scope 3[2] (100 tCO_2e)		90 tCO_2e (sold)	10 tCO_2e (upstream T&D)

Note:

1. Reported tCO_2e are calculated using an emission factor of 0.2 MWh/tCO_2e (see Question 5.2.20). This emission factor is used for simplicity.
2. The reporting of emissions associated with upstream T&D losses is optional for the end user (Hotel).

Question 7.2.30

What are the methods of accounting for scope 2 emissions?

Interpretive response: There are two methods used to account for an entity's purchased energy:

- one that represents local electricity production and may be more closely tied to physical energy consumption, referred to as the location-based method; and
- another that depicts a version of energy consumption that takes contractual decisions into account, referred to as the market-based method.

The market-based method may or may not be tied to physical energy consumption. It is in this method that a decision to purchase renewable energy, for example, becomes relevant.

Location-based method

The location-based method reflects the average emissions intensity of grids on which energy consumption physically occurs. It is useful for understanding: [GHGP S2 p 26]

- GHG intensity of grids where operations occur;
- aggregate GHG performance of energy-intensive sectors; and
- risks and opportunities aligned with local grid resources and emissions.

Market-based method

The market-based method reflects emissions from electricity that entities have purposefully chosen (see Question 7.3.20). It is useful for understanding: [GHGP S2 p 26]

- individual corporate procurement actions;
- opportunities to influence electricity suppliers and supply; and

- risks and opportunities conveyed by contractual relationships.

According to the GHGP Scope 2 Guidance, both methods are presented because they illustrate changes to grid emissions over time (location-based method) and how much zero-emission energy an entity is signaling it is willing to buy (market-based method). Over time, this shows whether the differential between these two methods is shrinking or growing. [GHGP S2 pp 7, 27]

Question 7.2.40
What activity data supports scope 2 emissions?

Interpretive response: According to the GHGP Scope 2 Guidance, energy consumption activity data includes all energy purchased and/or acquired and consumed from an entity outside of the entity or from owned and/or operated generation facilities where energy attributes have been sold or transferred. [GHGP S2 p 44]

Both the location- and market-based methods calculate emissions using the same activity data. However, the two methods tell different stories about that activity data.

The most precise activity data is metered electricity consumption or utility bills specifying consumption in MWh or kilowatt hour (kWh) units. If this type of data is not available, estimations are used. [GHGP S2 p 44]

Example 7.2.20
Estimating energy consumption

Hotel leases 4,000 square feet of space in a 10,000 square foot office building that is fully occupied. There is no metering available to calculate Hotel's own energy consumption.

Upon inquiry with the landlord, Hotel determines that energy consumption during the year for the entire building is 9,000 MWh. From this, Hotel estimates its energy consumption as follows.

Usage rate	4,000 sq ft / 10,000 sq ft = 40%
Energy consumption	40% × 9,000 MWh = 3,600 MWh

Question 7.2.50
Which emission factors are used to calculate scope 2 emissions?

Interpretive response: The location-based method uses mostly grid-average emission factors, while the market-based method derives emission factors from contractual instruments. Certain types of contractual instruments (e.g. renewable energy certificates or power purchase agreements) may convey an emission factor of zero.

Location-based scope 2 emissions

Grid-average emission factors represent the average of all GHG emissions associated with the quantity of electricity generation produced from facilities within a specified geographic boundary. [GHGP S2 p 53]

The GHGP Scope 2 Guidance provides a hierarchy of location-based method emission factors, starting with regional or subnational emission factors (e.g. eGRID, Defra) and moving to national production emission factors (e.g. IEA). [GHGP S2 p 47]

Market-based scope 2 emissions

Contractual instruments represent choices – e.g. choosing a retail electricity supplier, a specific generator or a differentiated electricity product – that are conveyed through agreements between the purchaser and the provider. Contractual instruments may differ from the underlying energy flows in the grid – e.g. may not necessarily represent the emissions caused by the purchaser's consumption of electricity. [GHGP S2 p 26]

These contractual instruments only convey a claim to use the emission factor associated with a certain amount of renewable electricity generation (see Question 7.3.10). They do not change how renewable electricity is physically delivered or consumed.

Markets differ as to what contractual instruments are commonly available or used by entities to purchase energy or claim specific attributes about it, but they may include the following.

- **Energy attribute certificates** (EACs) represent certain information (or attributes) about the energy generated but do not represent the energy itself. Examples include renewable energy certificates (RECs) and guarantees of origin (GOs). See Question 7.3.10. [GHGP S2 p 80]
- **Contracts** allow a consumer, typically larger industrial or commercial entities, to form an agreement with a specific energy generator. One example is power purchase agreements. See Question 7.3.30. [GHGP S2 p 55]
- **Supplier/utility emission rates** are provided by the electricity retailer and measure the GHG intensity of delivered electricity. [GHGP S2 p 55]
- **Residual mix** is essentially an emission factor from which all renewable components have been removed. For entities without any of the above

contractual instruments, the residual mix provides an emission factor for use in a market-based method calculation. [GHGP S2 p 106]

While many contractual instruments under the market-based method represent a zero emission rate from renewable energy (e.g. RECs), the market-based method also includes other contractual instruments representing fossil fuel or mixed-resource emission factors (e.g. supplier emission rates). [GHGP S2 p 63]

The following table, adapted from the GHGP Scope 2 Guidance, illustrates the hierarchy of data from which market-based emission factors may be derived. Entities can still apply the market-based method even if they do not have contractual data for every site. Any data in this hierarchy – including using location-based grid average emission factors in the absence of contractual information – is acceptable. [GHGP S2 p 48]

Emission factors	Precision
Energy attribute certificates	Higher
Contracts	
Supplier/utility emission rates	
Residual mix	
Other grid-average emission factors	Lower

All of the contractual instruments in the hierarchy must meet Scope 2 Quality Criteria (see Question 7.2.60).

Residual mix

The residual mix factor is used when an entity cannot apply emission factors from any of the other contractual instruments – e.g. EACs, contracts, supplier- or utility-specific. The residual mix factors are essentially location-based grid-average emission factors, but with all the RECs, certificates and other attributes within the market boundary removed. And so the residual mix represents the non-renewable components of the grid.

This means the residual mix factor will typically be higher in the emissions calculation than the grid average. This is because renewable energy attributes are not double counted in the residual mix factor – e.g. the grid-average emission factor is lowered by its inclusion of renewable energy attributes that may have been claimed by certain users of the grid.

A residual mix factor may not be available in every market. The GHGP requires entities to disclose such absence transparently. See Appendix A. [GHGP S2 p 22]

Example 7.2.30
Using location-based emission factors in the absence of contractual information

Hotel and Restaurant operate within the same electricity grid, which is supplied by coal and natural-gas power plants.

They each consumed the same amount of electricity during the year. Hotel consumed electricity generated from its local power grid while Restaurant consumed electricity generated from a solar farm near its location.

Location-based scope 2 emissions

Hotel and Restaurant both apply the same grid-average emission factor and therefore calculate the same scope 2 location-based emissions. This is because when consumption of energy is equal, the entities' physical locations drive the measurement.

Market-based scope 2 emissions

To calculate market-based emissions, Restaurant uses an emission factor of zero, based on the fact that it chose to purchase offsite renewable electricity and the associated REC conveyed an emission factor of zero. Therefore, Restaurant's scope 2 market-based emissions are zero.

Because Hotel operates in a market where contractual instruments are available, it will calculate scope 2 market-based emissions. Hotel has no energy attribute certificates (e.g. RECs) or contracts (e.g. PPAs) and there are no supplier- or utility-specific emission rates and no residual mix factor available.

Therefore, Hotel calculates scope 2 market-based emissions using the same grid average emission factor used to calculation scope 2 location-based emissions. In this case, the calculated scope 2 emissions according to the market-based method are identical to the location-based calculation. Hotel discloses the lack of availability of a residual mix factor.

Question 7.2.60
What are the Scope 2 Quality Criteria?

Interpretive response: The Scope 2 Quality Criteria are designed to maintain the integrity of contractual instruments. They represent the minimum features necessary to implement the scope 2 market-based method in a consistent way that is capable of producing accurate results and prevents double counting. [GHGP S2 p 63]

The following tables depicts the Scope 2 Quality Criteria (adapted from the GHGP Scope 2 Guidance). [GHGP S2 pp 60, 63-65]

All contractual instruments need to meet the following Scope 2 Quality Criteria.

Criteria	Considerations
Convey (either directly or implicitly) the direct GHG emission rate attribute associated with the unit of electricity produced.	Implicit claims may be evidenced through attestations from each owner in the chain of custody.
Be the only instruments that carry the GHG emission rate attribute claim associated with that quantity of electricity generation.	It is typical to check with the electricity supplier or relevant policy-making bodies to ensure certificates are claimed, paired or retired in compliance with applicable jurisdictional or program requirements.
Be tracked and redeemed, retired or canceled by or on behalf of the entity.	Retirement may be verified via a tracking system, an audit of contracts, third-party certification or other disclosure registries, systems or mechanisms.
Be issued and redeemed as close as possible to the period of energy consumption to which the instrument is applied.	In our experience, an entity may develop and disclose a policy.
Be sourced from the same market in which the entity's electricity-consuming operations are located and to which the instrument is applied.	Regulatory authorities and/or bodies responsible for certificates may establish the boundaries in which certificates may be traded and redeemed, retired or canceled.

All **utility-specific emission factors** need to:

Be calculated based on delivered electricity, incorporating certificates sourced and retired on behalf of customers.	This may be verified via receipt of the REC or third-party certifications.

All **contract-sourced emission factors** need to:

Be transferred to the entity only.	This may be verified via receipt of the REC or third-party certification.

Entities using contractual instruments in the market-based method need to:

Use an adjusted, residual mix characterizing the GHG intensity of unclaimed or publicly shared electricity.	See chapter 11 for disclosure considerations.

If contractual instruments do not meet the Scope 2 Quality Criteria, and no other market-based method data are available, location-based data are used. [GHGP S2 p 76]

Question 7.2.70
When does the market-based method apply?

Interpretive response: While disclosure of scope 2 emissions under the location-based method is always required, entities assess whether the market-based method is an additional requirement.

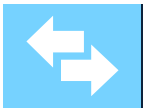
The market-based method applies to entities with any operations in markets providing product or supplier-specific data (e.g. emission factors) in the form of 'contractual instruments' (e.g. RECs, GOs, PPAs) that meet the Scope 2 Quality Criteria (see Question 7.2.60). [GHGP S2 p 8]

If a multi-regional entity has any operations within its organizational boundary where the market-based method applies, the market-based method is calculated for the entity's entire inventory. For those regions that do not have any market instruments to apply, that region's location-based emissions measurement is also included as the market-based emissions. [GHGP S2 p 44]

The market-based method is not relevant if no operations in the entity's organizational boundary are located in markets with contractual instruments (e.g. RECs, PPAs, supplier-specific rates, residual mix factor) available, or where no instruments within those systems meet the Scope 2 Quality Criteria (see Question 7.2.60). In this case, only the location-based method (e.g. grid-average emission factors) is used to calculate scope 2 emissions.

Question 7.2.80**
Can a location-based emission factor be used in a market-based method calculation?

Interpretive response: It depends. A grid-average emission factor may only be used for calculating scope 2 market-based emissions when there is no product, supplier-specific or residual mix data available. While the Scope 2 Quality Criteria (see Question 7.2.60) permit the use of a range of inputs, unadjusted grid-average emission factors (e.g. location-based emission factors) are permitted only in the event a residual mix factor is not available. The absence of a residual mix is required to be disclosed (see Question 7.2.50). [GHGP S2 pp 8, 56-57]



Reporting landscape
Scope 2 methods

As shown in the following table, each framework has different scope 2 measurement requirements.

ISSB	ESRS
An entity discloses location-based information, but also presents information about contractual instruments[1] related to managing energy it has purchased. [IFRS S2.29(a)(v)] Note 1: As part of its disclosure, an entity might disclose information about its market-based scope 2 emissions. [IFRS S2.B31]	An entity discloses both location- and market-based information. [ESRS E1.49(a)-(b)]

7.3 Renewable energy

Question 7.3.10
What is a renewable energy attribute?

Interpretive response: Renewable energy consists of (1) power and (2) environmental attributes (e.g. energy attribute certificates) that may be sold together (bundled) or separately (unbundled).

The following table explains these terms. [GHGP S2 pp 100, 107]

	Definition	Example
Bundled	Energy attribute certificate traded with underlying energy produced.	A wind farm generates one MWh of power and sells the electricity itself at a market rate to the local grid, bundled with one corresponding certificate at a separately determined price sold to a consumer operating on the same grid.
Unbundled	Energy attribute certificate is separate, and may be traded separately, from the underlying energy produced.	A wind farm generates one MWh of power and sells the electricity itself at a market rate to the local grid, while separately selling the corresponding certificate to a consumer in another region operating on a different grid.

Renewable energy certificates

RECs are tradeable instruments that represent the clean energy attributes (e.g. zero emissions) of renewable energy (e.g. solar, wind, hydropower, geothermal). RECs typically represent the environmental attributes (e.g. emission factor) from one MWh of electricity produced by a renewable energy source.

By accounting for and assigning ownership to the attributes of renewable energy generation and use, RECs allow energy buyers to distinguish between renewable and non-renewable energy sources. As a result, REC owners can claim renewable energy from a specific source.

Each REC is uniquely identified and includes data such as where it was generated, when it was generated and by what source. When the owner of a REC makes a renewable energy claim (e.g. claims the zero emission factor in the scope 2 market-based method calculation) based on that REC, it is then retired and is no longer a tradeable asset. Question 7.2.60 further discusses REC retirement and Scope 2 Quality Criteria.

Question 7.3.20
How do consumers purposefully choose their electricity?

Interpretive response: Consumers of grid-supplied electricity cannot connect electricity use to its generation – i.e. they cannot directly or physically distinguish the energy generation facilities that are supplying their consumption at any given point in time. Contractual instruments allow an entity to claim energy produced from renewable sources as its own – even when it did not physically consume the MWh produced. The renewable energy attributes (e.g. zero emissions) are issued per MWh produced regardless of whether the underlying energy is consumed by the entity. [GHGP S2 p 79]

The market-based method is based on the contractual purchase of electricity bundled with contractual instruments (physical consumption is tied to renewable energy attribute) or contractual instruments on their own (synthetic 'consumption' of renewable energy only). See Question 7.3.10.

Example 7.3.10
Unbundled RECs

A restaurant in Boston, Massachusetts powers its operations with local grid-supplied electricity. The restaurant used 60,000 MWh of electricity during the year.

A Texas wind farm is supplying renewable energy to the local Dallas grid. It is also receiving RECs for each MWh of electricity generated and selling those RECs to buyers around the country.

The Boston restaurant purchases 60,000 MWh worth of RECs from the Texas wind farm. The RECs convey an emission factor of zero and therefore in the Boston restaurant's calculation of scope 2 market-based emissions, it applies an emission factor of zero to the consumption of 60,000 MWh of electricity. As a result, the scope 2 market-based emissions for the Boston restaurant are zero.

Question 7.3.30
What is a power purchase agreement?

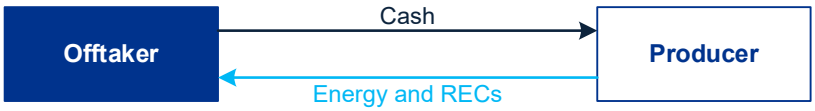
Interpretive response: As defined in the GHGP Scope 2 Guidance, a power purchase agreement (PPA) is a type of contract that allows a consumer, typically large industrial or commercial entities, to form an agreement with a specific energy-generating unit. The contract itself specifies the commercial terms, including delivery, price and payment terms. In many markets, these contracts secure a long-term stream of revenue for an energy project. [GHGP S2 p 106]

Two main types of PPA are prevalent in the renewable energy marketplace: physical PPAs and virtual PPAs.

Physical PPA

A physical PPA is an agreement for the purchase and sale of energy between a consumer buyer (also known as an 'offtaker') and energy generator (also known as a 'producer'). In renewable energy, PPAs typically have either fixed or variable per-unit pricing, where variable prices are linked to an underlying energy index. Contract quantities may be equal to all or a portion of the energy generated by the renewable energy project. RECs corresponding to generation of the qualifying renewable energy may or may not be transferred as part of a bundled sale.

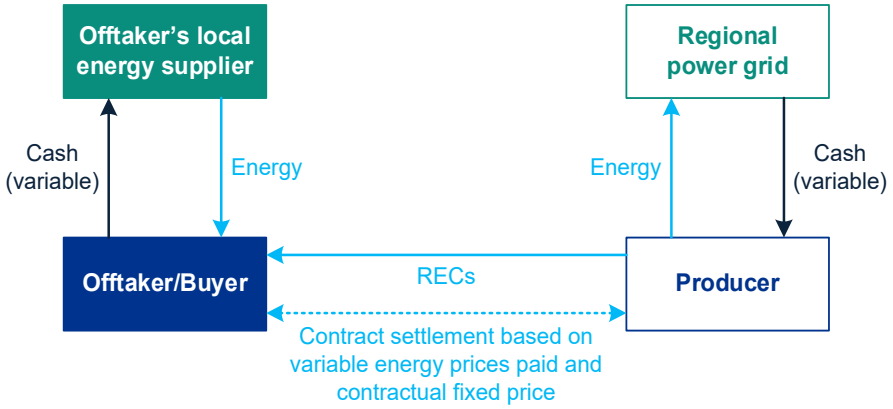
A renewable energy project may be located on or off the offtaker's premises. The producer may deliver energy directly to the offtaker through transmission lines connected to the offtaker's facilities, or indirectly through the regional power grid.



Virtual PPA

A virtual PPA (also known as a financial PPA), is an arrangement between a producer and a buyer in which the buyer pays a fixed price per unit of generated energy in exchange for a floating (market) price. The contract is periodically settled net in cash and energy is not physically delivered to the buyer.

Most virtual PPAs result in the transfer of the corresponding RECs to the buyer at settlement. Virtual PPAs create an opportunity for the buyer to receive the corresponding RECs without committing to take delivery of physical power.



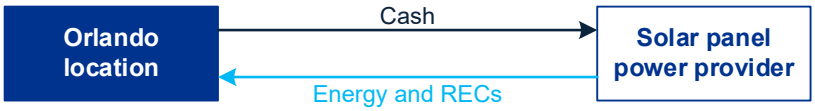
Example 7.3.20
Identifying physical and virtual PPAs

Hotel operates a hotel in Orlando with a physical PPA in place and a hotel in Chicago with a virtual PPA in place. In both cases, Hotel receives the RECs associated with the energy generation and calculates its scope 2 market-based emissions by applying the emission factor from the RECs (see Question 7.2.70) to the associated amount of energy consumption.

The distinction between the PPA and virtual PPA affects whether the energy is physically delivered to Hotel, but it does not affect the transfer of the REC and its corresponding treatment in Hotel's emissions disclosures.

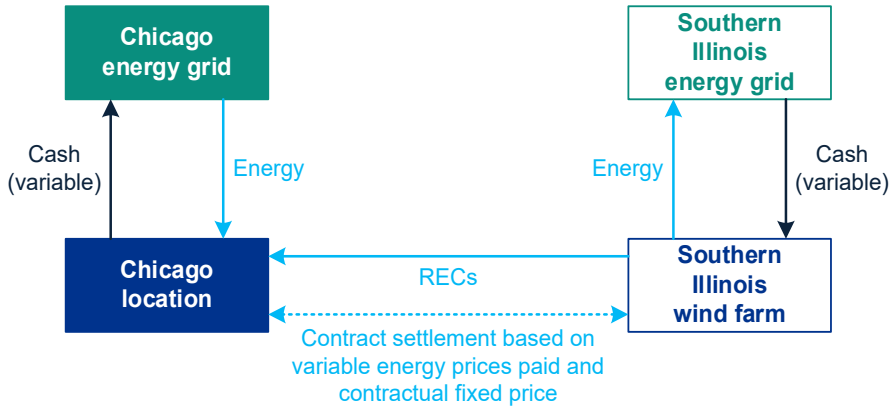
Hotel's Orlando location with a physical PPA in place

Hotel contracted with a third-party developer to build on-site solar panels in an arrangement that is not a lease. Hotel receives energy and the associated RECs from the solar panel generation. Per the PPA contract, Hotel pays the third-party developer a fixed price for the energy.



Hotel's Chicago location with a virtual PPA in place

The agreement is with a wind farm in southern Illinois that generates energy for a different grid than the one on which Hotel operates. Hotel pays the wind farm for each unit of generated energy. Hotel does not physically receive the associated energy, but it does receive the associated RECs.



8. Scope 3 emissions

Detailed contents

Item significantly updated in this edition #
New item added in this edition **

8.15 Category 13: Downstream leased assets

Question

8.16 Category 14: Franchises

Questions

Example

8.17 Category 15: Investments

Questions

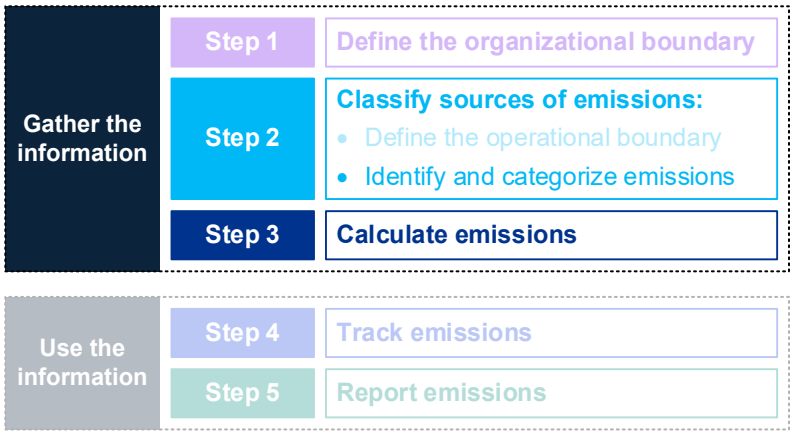
Example

Reporting landscape: ISSB, ESRS

Financed emissions

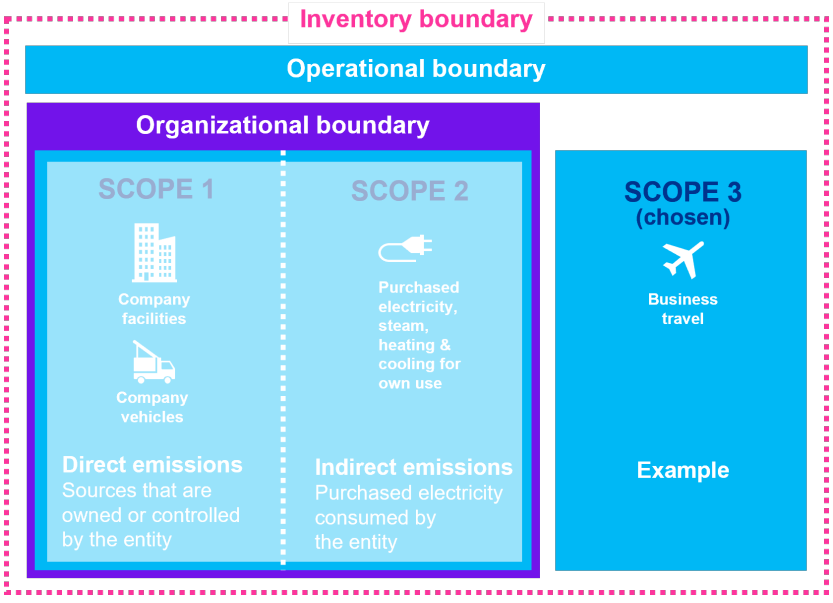
8.1 How the GHGP works

This chapter is structured similarly to chapters 6 and 7 (scopes 1 and 2 emissions). Having provided an overview of how emissions are calculated in chapter 5, this chapter looks more closely at scope 3 emissions and the 15 categories: what they are in the context of identifying and categorizing emissions (part of Step 2) and calculating emissions (Step 3).



Unlike scopes 1 and 2, scope 3 emissions occur outside the organizational boundary. They are indirect emissions – because they do not occur from sources that are owned or controlled by the entity – but are part of an entity's upstream or downstream value chain.

In addition, they are not required to be reported if an entity is following the GHGP Corporate Standard. Instead, an entity can elect to report one or more categories within scope 3 – e.g. business travel and employee commuting.



Entities that are required (or elect) to report relevant scope 3 emissions comply with the GHGP Scope 3 Standard in addition to the GHGP Corporate Standard.

8.2 Identifying and measuring scope 3 emissions

Question 8.2.10
What are scope 3 emissions?

Interpretive response: An entity's scope 3 emissions include all emissions up or down its value chain that are not already included in scopes 1 and 2 as part of the organizational boundary.

Scope 3 emissions often represent the majority of an entity's total GHG emissions. Increasingly, stakeholders are directing more pressure on entities to account for GHG emissions in their value chains and portfolios to manage and identify climate-related risks and opportunities.

The following table is a list of the 15 scope 3 categories, each of which is discussed in this chapter. [GHGP S3 p 32]

Upstream	Downstream
1. Purchased goods and services 2. Capital goods 3. Fuel- and energy-related activities (not included in scope 1 or 2) 4. Upstream transportation and distribution 5. Waste generated in operations 6. Business travel 7. Employee commuting 8. Upstream leased assets	9. Downstream transportation and distribution 10. Processing of sold products 11. Use of sold products 12. End-of-life treatment of sold products 13. Downstream leased assets 14. Franchises 15. Investments

Reporting landscape
Scope 3 emissions

As shown in the following table, the scope 3 disclosures under IFRS Sustainability Disclosure Standards and ESRS are similar but not the same.

ISSB	ESRS
An entity discloses its gross scope 3 emissions.[1] [IFRS S2.29(a)(i)(3)] An entity discloses scope 3 emissions using information that is reasonable, supportable and available at the reporting	An entity discloses its gross scope 3 emissions.[1] [ESRS E1.44(c)] Note 1: There is temporary transition relief from this disclosure (one year) for entities that do not exceed on their balance sheet date an average of 750

ISSB	ESRS
date without undue cost or effort. [IFRS S2.B39] Note 1: There is temporary transition relief from this disclosure (one year). [IFRS S2.C4(b)]	employees during the financial year. [ESRS 1 App C]

Question 8.2.20
Are leased assets included in scope 3 emissions?

Interpretive response: The inclusion in scope 3 of emissions from leased assets (as a lessor or a lessee) depends on the approach chosen for an entity's organizational boundary (see Question 4.3.20). To the extent such emissions are included in scope 3, they will be in either:

- category 8 (upstream leased assets) – see section 8.10; or
- category 13 (downstream leased assets) – see section 8.15.

Question 8.2.30
What periods of activity data are used to calculate scope 3 emissions?

Interpretative response: An entity's scope 3 emissions for a reporting year are based on the activity of the entity occurring in that reporting year. [GHGP S3 p 32]

For some scope 3 activities, emissions related to the entity's activity will occur in the same year as the entity's reporting year. However, for some activities, emissions related to the entity's activity in the current year may have occurred in the past (e.g. when a purchased product was manufactured) or will occur in the future (e.g. when a customer uses a sold product). [GHGP S3 p 32]

These past and/or future year emissions are included in the entity's scope 3 emissions in the reporting year in which the entity's activity occurs – e.g. when it purchases a product. [GHGP S3 p 32]

The following table shows each scope 3 category and the years in which emissions occur even though they will be measured in the entity's reporting year. [GHGP S3 p 33]

Scope 3 category	Past years	Reporting year	Future years
1. Purchased goods & services			
2. Capital goods			

Scope 3 category	Past years	Reporting year	Future years
3. Fuel- and energy-related activities			
4. Upstream transportation & distribution			
5. Waste generated in operations			
6. Business travel			
7. Employee commuting			
8. Upstream leased assets			
9. Downstream transportation & distribution			
10. Processing of sold products			
11. Use of sold products			
12. End of life treatment of sold products			
13. Downstream leased assets			
14. Franchises			
15. Investments			

Example 8.2.10
Scope 3 time boundaries

The following examples illustrate two scenarios where the past and/or future year emissions are included in the entity's scope 3 emissions in the reporting year in which the entity's activity occurs.

Scenario 1: Past years' emissions

Retailer purchases aged whiskey from Supplier, with whiskey production taking approximately 12 years.

Retailer accounts for all emissions associated with the production of the whiskey (from all 12 years of production) as scope 3 emissions in the reporting year in which it purchases the whiskey.

Scenario 2: Future years' emissions

Building Manager sends 85% of the waste from operations to the landfill. The waste sent to the landfill during the reporting year may slowly release CO_2 from degradation of the waste over 10 years.

Building Manager accounts for all expected future emissions (for the next 10 years) associated with the waste sent to the landfill as scope 3 emissions in the reporting year in which the waste is sent to the landfill.

Question 8.2.40
What activity data supports scope 3 emissions?

Interpretive response: There are two types of data that an entity can use to calculate scope 3 emissions.

- **Primary data** may be provided directly from suppliers or other value chain partners and include specific activity-related data or actual emissions. It can be costly to obtain and difficult to verify the quality of data provided by a supplier. [GHGP S3 p 71]
- **Secondary data** is general data that's available, such as industry-average data. This type of data is used to estimate scope 3 emissions when primary data is unavailable. The disadvantage is that it may lack accuracy as to the specific activities of the entity. [GHGP S3 p 71]

An entity will likely use a combination of primary and secondary data to calculate scope 3 emissions. Data selection is heavily dependent on the entity's business goals – e.g. primary data may be most useful for tracking performance against GHG reduction goals, while secondary data may be most useful for identifying emissions hot spots. [GHGP S3 p 74-75]

Other instances in which secondary data may be used include activities: [GHGP S3 p 75]

- that are not prioritized based on initial estimation methods – e.g. activities expected to be insignificant in size, activities over which the entity has little influence, activities with minimal financial significance;
- for which primary data is not available – e.g. supplier is unable to provide data; or
- for which the quality of secondary data is higher than primary data – e.g. supplier is unable to provide data of sufficient quality.

Available data likely has varying levels of detail and granularity. The GHGP Scope 3 Standard encourages collecting data from suppliers that is as specific as possible to the product or service purchased. The standard outlines a data hierarchy ranked in order of specificity (see excerpt below). [GHGP S3 p 79]

Data not collected at product-level specificity may require an allocation of emissions. Regardless, the data collection process for calculating scope 3 emissions will likely need reviewed each reporting period in an effort to improve data quality over time; this is acknowledged in the GHGP Scope 3 Standard. [GHGP S3 pp 65, 79]

Excerpt from GHGP Scope 3 Standard [p 80]

Levels of data (ranked in order of specificity)

Data type	Description
Product-level data	Cradle-to-gate[1] GHG emissions for the product of interest
Activity-, process- or production line-level data	GHG emissions and/or activity data for the activities, processes, or production lines that produce the product of interest
Facility-level data	GHG emissions and/or activity data for the facilities or operations that produce the product of interest
Business unit-level data	GHG emissions and/or activity data for the business units that produce the product of interest
Corporate-level data	GHG emissions and/or activity data for the entire corporation

1 Cradle-to-gate GHG emissions include all emissions that occur in the life cycle of purchased products, up to the point of receipt by the reporting company (excluding emissions from sources that are owned or controlled by the reporting company. [GHGP S3 p 85]

Example 8.2.20
Primary and secondary data

The following examples illustrate two scenarios where either primary or secondary data may be better suited to the activity type.

Scenario 1: Primary data

An airline provider includes in a booking confirmation the expected tCO_2e for an individual for a purchased flight based on the size of aircraft and distance. This is primary data because it is provided directly from the supplier.

Scenario 2: Secondary data

A car manufacturer purchases steel from various suppliers, none of which have available data associated with steel production emissions. The manufacturer estimates purchased steel emissions by applying an industry-average emission factor to the amount of steel purchased. This is secondary data because it is not provided directly from the supplier.

Reporting landscape#
Scope 3 emissions data

As shown in the following table, IFRS Sustainability Disclosure Standards and ESRS are similar but not the same.

ISSB	ESRS
An entity discloses information about the characteristics of data inputs (e.g. primary versus secondary data) and the extent to which it has used verified data. [IFRS S2.B40(a)-(b), B46–B49, B55, B56(b)] An entity prioritizes the use of primary data. If secondary data is used, an entity considers the extent to which the data faithfully represents the entity's activities.[1] Faithful representation means the information is complete, neutral and accurate. [IFRS S2.B47, B49, IFRS S1.D10] Note 1: In rare cases when it is impracticable for an entity to estimate scope 3 emissions using secondary data and industry averages, the entity discloses how it is managing its scope 3 emissions. [IFRS S2.B57]	An entity discloses the percentage of scope 3 emissions calculated using primary data obtained from suppliers or other value chain partners. [ESRS E1.AR46(g)] If an entity cannot collect value chain information after making reasonable efforts to do so, it estimates the information using reasonable and supportable information available at the reporting date without undue cost or effort. This includes data from indirect sources, sector-average data, sample analyses, market and peer groups data, other proxies or spend-based data. [ESRS 1.AR17]

Question 8.2.50
What emission factors are used for scope 3?

Interpretive response: Scope 3 emissions include a wide range of activities and therefore an inventory preparer can expect a wide range of applicable emission factors. The following table adapted from the GHGP Scope 3 Standard provides some examples. [GHGP S3 p 68]

Activity data	Emission factor
Liters of fuel consumed	kgCO_2e per liter of fuel consumed
Kilowatt-hours of electricity consumed	kgCO_2e per kWh of electricity consumed
Hours of time operated	kgCO_2e per hour of time operated
Kilogram of product sold	kgCO_2e per kg of product sold
Quantity of money spent	kgCO_2e per unit of currency spent

Throughout this chapter, we provide various illustrative examples. For simplicity, we have used emission factors that portray tCO_2e per unit of activity – e.g. tCO_2e per mile, tCO_2e per tonne of product. Therefore, these illustrative examples do not demonstrate the unit conversion calculation (e.g. converting pounds to tonnes; see Question 5.2.20) or the GWP conversion calculation (e.g. converting CH_4 to CO_2e; see Question 2.3.50).

The GHGP Scope 3 Calculation Guidance includes further details on the types of emission factors available. For example, life cycle emission factors or cradle-to-gate emission factors are used for calculating emissions associated with a material or product, while life cycle emission factors or combustion emission factors are used for calculating emissions associated with energy. [GHGP S3C p 14]

A detailed discussion of these emission factors is outside the scope of this handbook, but it should be emphasized that a key component of emission factors used in the scope 3 calculation is that they often have a life cycle or 'cradle-to-gate' component. Questions 8.2.30 and 8.2.40 discuss how past year and future year emissions are incorporated into the scope 3 calculation.

Question 8.2.60#

What are environmentally-extended input output (EEIO) models?

Interpretive response: As defined by the GHGP Scope 3 Standard, EEIO models estimate energy use and/or GHG emissions from production and upstream supply activities of different sectors and products. These models are typically based on the allocation of national GHG emissions to groups of finished products. [GHGP S3 p 66]

The result of applying such a model is an EEIO emission factor that can be used by an entity to calculate an estimate of scope 3 emissions for an industry or product. [GHGP S3 p 66]

When using an EEIO emission factor, the spend data may need to be converted to the currency of the emission factor (e.g. from Euros to USD) and adjusted to account for inflation impacts since the development of the EEIO emission factor. This is because the EEIO emission factor quantification is done using the hindsight of actual emissions information within a defined time period for both the industry emission information and economic measures (e.g. revenue). In our experience, the process to gather the data to develop the emission factors can be time consuming. [GHGP S3C p 17]

Example 8.2.30**
Applying the EEIO method

Hotel purchases $50,000 of new embossed stationery for its guest rooms in 2022. The emissions associated with the production of the office furniture are included in scope 3-category 2.

Hotel uses a software tool with emission factor data based on 2018 information (i.e. 2018 revenue and emission industry data), which is the latest available dataset. The 2018 emission factor for office furniture was 0.05 tCO_2e /US$. Inflation since 2018 is 10%.

To make the application of the emission factor from 2018 stated on the same basis, Hotel adjusts its spend data from 2022 USD to 2018 USD as follows:

2022 spend	Inflation since 2018	2022 spend stated in 2018	Emissions of new furniture
$50,000	10%	$45,000	(45,000*0.05) = 2,250 tCO_2e

8.3 Category 1: Purchased goods and services

Question 8.3.10
What are purchased goods and services emissions (category 1)?

Interpretive response: Scope 3-category 1 accounts for emissions related to the production of products (both goods and services) purchased or acquired by the entity during the reporting year. [GHGP S3 p 38]

The category includes all upstream emissions (cradle-to-gate) of a product up to the point of purchase by an entity (see Question 8.2.30). [GHGP S3 p 38]

Emissions can be differentiated between purchases of production-related products (e.g. materials, components) and non-production-related products (e.g. office furniture, office supplies, IT support). [GHGP S3 p 38]

The following table identifies emissions that may be related to purchased products, but which are not included in scope 3-category 1.

Emissions source	Classification	Reference
Use of purchased goods by the entity	Scope 1 or 2	Chapters 6 and 7
Purchased capital goods	Scope 3-category 2 (purchased capital goods)	Section 8.4

Emissions source	Classification	Reference
Transportation and distribution of purchased goods	Scope 3-category 4 (upstream transportation and distribution)	Section 8.6

Question 8.3.20

How are purchased goods and services emissions calculated?

Interpretive response: There are four methods used to calculate scope 3 emissions from purchased goods and services. [GHGP S3C p 21]

Calculation method	Description
Supplier-specific	Product-level cradle-to-gate data
Hybrid	Supplier-specific data and secondary data to fill gaps
Average-data	Mass (or other unit) × emission factor
Spend-based	Cost × emission factor

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate. See Question 8.2.40.

Example 8.3.10

Calculating purchased goods and services emissions using the supplier-specific method

Hotel decides to repaint the walls of its lobby as part of an ongoing renovation. The emissions associated with the production of the purchased paint are included in scope 3-category 1.

Using the supplier-specific method, the formula to calculate emissions associated with purchased goods and services during the reporting period is:

Activity data: Σ (quantities of goods purchased)
×
Supplier-specific product emission factor of purchased good or service

To perform this calculation, Hotel gathers the following information.

Type	Source	Data	Unit
Activity data	Purchased paint	50	tonnes
Supplier emission factor	Direct from supplier	0.1	tCO_2e per tonne

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
50 tonnes × 0.1 tCO_2e per tonne = **5 tCO_2e**

8.4 Category 2: Capital goods

Question 8.4.10
What are capital goods emissions (category 2)?

Interpretive response: Scope 3-category 2 accounts for emissions related to the production of capital goods purchased or acquired during the reporting year. Capital goods are likely used to manufacture a product, provide a service, or sell, store and deliver merchandise. [GHGP S3 p 39]

The category includes all upstream emissions (cradle-to-gate) of a capital good up to the point of purchase by an entity (see Question 8.2.30). [GHGP S3 p 39]

Assets that are typically depreciated or amortized in financial accounting, such as fixed assets or plant, property and equipment, are examples of capital goods. [GHGP S3 p 39]

Purchased goods that are not identified as capital goods are included in only category 1 to avoid double counting.

The following table identifies emissions that may be related to capital goods, but which are not included in scope 3-category 2.

Emissions source	Classification	Reference
Use of capital goods	Scope 1 or 2	Chapters 6 and 7
Purchased goods (that are not capital goods)	Scope 3-category 1 (purchased goods and services)	Section 8.3

Example 8.4.10
Identifying capital goods emissions

Hotel purchases new king-sized mattresses for deluxe rooms, which it capitalizes and will depreciate over five years for financial reporting purposes.

The production of each mattress is performed in a single factory and includes materials such as cotton, steel coils, plastic and foam. Hotel includes in scope

3-category 2 the emissions associated with factory production and the lifecycle emissions of each material used in production.

Question 8.4.20
How are capital goods emissions calculated?

Interpretive response: The calculation methods for scope 3-category 2 are consistent with category 1. See Question 8.3.20.

8.5 Category 3: Fuel- and energy-related activities

Question 8.5.10
What are fuel- and energy-related activities emissions (category 3)?

Interpretive response: Scope 3-category 3 accounts for emissions related to the production of fuels and energy purchased and consumed during the reporting year, which are not included in scopes 1 or 2. [GHGP S3 p 41]

The category includes all upstream emissions (cradle-to-gate) related to activities up to the point of purchase by an entity (see Question 8.2.30). [GHGP S3 p 41]

There are typically three activities that end users of fuel and purchased electricity may need to consider. [GHGP S3 p 41]

- **Upstream emissions of purchased fuels.** Extraction, production and transportation of fuels consumed by the entity.
- **Upstream emissions of purchased electricity.** Extraction, production and transportation of fuels consumed in the generation of electricity, steam, heating and cooling that is consumed by the entity.
- **Transmission and distribution (T&D) losses.** Generation of electricity, steam, heating and cooling that is lost in a T&D system.

  Note: Electricity generated by a power station will not match the energy distributed to consumers because of energy losses in a distribution network resulting from a variety of possible factors – e.g. long distribution lines, deficient network infrastructure. See chapter 7 for further discussion. Category 3 includes emissions associated with the loss.

A fourth activity included in category 3, but generally only applicable to utility companies and energy retailers, is the generation of purchased electricity that is subsequently sold to end users. [GHGP S3 p 41]

Example 8.5.10
Identifying fuel- and energy-related activities emissions

The following example illustrates three scenarios of activities that are included in scope 3-category 3.

Scenario 1: Upstream emissions of purchased fuels

Hotel purchases gasoline for consumption in an owned and operated shuttle bus between Hotel and Airport.

- The combustion of the gasoline is included in scope 1 (see section 6.2).
- The emissions from extraction, production and transportation of the purchased gasoline, supplied by Oil, are included in scope 3-category 3.

Scenario 2: Upstream emissions of purchased electricity

Hotel purchases electricity from an energy grid, which is heavily reliant on coal as an energy source.

- The emissions from burning the coal that generates the purchased electricity are included in scope 2 (see section 7.2).
- The emissions from mining the coal used in the energy grid are included in scope 3-category 3.

Scenario 3: Transmission and distribution (T&D) losses

Hotel, which is in a remote rural location, purchases electricity from an energy grid. Due to lengthy distribution lines, 4% of energy generated by the power station is lost before reaching consumers.

The emissions from the generation of energy by the power station that are lost (T&D losses) are included in scope 3-category 3.

Note: Example 7.2.10 illustrates a single set of transactions between a power generator, utility and end consumer, and how the GHG emissions (including T&D losses) are classified between scopes 1, 2 and 3.

Question 8.5.20
How are fuel- and energy-related activities emissions calculated?

Interpretive response: There are two methods used to calculate scope 3 emissions from fuel- and energy-related activities. [GHGP S3C p 40]

Calculation method	Description
Supplier-specific	Data from energy providers
Average-data	Estimation using secondary data

Each of the four activities (see Question 8.5.10) has a calculation methodology, as detailed in the GHGP Scope 3 Calculation Guidance, which is outside the scope of this handbook.

8.6 Category 4: Upstream transportation and distribution

Question 8.6.10
What are upstream transportation and distribution emissions (category 4)?

Interpretive response: Scope 3-category 4 accounts for emissions related to the transportation and distribution of products purchased in the reporting year in vehicles not owned or operated by the entity. The category also includes third-party transportation and distribution services (inbound, outbound and between facilities) purchased by the entity. [GHGP S3 p 44]

Emission sources may include air, rail, road and marine transport. Emissions from the storage of purchased products in warehouses, distribution centers and retail facilities can also be a source. [GHGP S3 p 44]

The category relates to transportation and distribution with Tier 1 suppliers. Emissions associated with Tier 2 suppliers are included in category 1 (purchased goods and services; see section 8.3). [GHGP S3 p 44]

The following table defines Tier 1 and Tier 2 suppliers. [GHGP S3 p 57]

Supplier classification	Description
Tier 1	Entity has a direct purchase order for goods and services
Tier 2	Tier 1 supplier has a purchase order for goods and services

The following table identifies emissions that may be related to transportation and distribution emissions.

Emissions source	Classification	Reference
Transportation and distribution in vehicles owned or controlled by the entity	Scope 1 or 2	Chapters 6 and 7
Transportation and distribution between Tier 1 and Tier 2 suppliers	Scope 3-category 1 (purchased goods and services)	Section 8.3
Transportation of fuels and energy consumed	Scope 3-category 3 (fuel- and energy-related emissions not included in scope 1 or 2)	Section 8.5

Emissions source	Classification	Reference
Transportation and distribution between Tier 1 supplier and entity	Scope 3-category 4 (upstream transportation and distribution)	Section 8.6
Transportation and distribution in vehicles leased by the entity	Scope 3-category 8 (upstream leased assets) or scope 1 or 2	Question 8.2.20
Transportation and distribution of sold products	Scope 3-category 9 (downstream transportation and distribution)	Section 8.11

Question 8.6.20
How are upstream transportation and distribution emissions calculated?

Interpretive response: There are three methods used to calculate scope 3 emissions from upstream transportation and distribution. [GHGP S3C p 51]

Calculation method	Formula
Fuel-based	Fuel consumed × Emission factor
Distance-based	Distance × Emission factor
Spend-based	Cost × Emission factor

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate. See Question 8.2.40.

8.7 Category 5: Waste generated in operations

Question 8.7.10
What are waste generated in operations emissions (category 5)?

Interpretive response: Scope 3-category 5 accounts for emissions related to third-party disposal and treatment of waste generated from operations in the reporting year. Emissions sources may include landfill disposal, incineration and composting or wastewater treatment. It also includes the transportation of waste in third-party vehicles. [GHGP S3 p 44]

The category includes all downstream future emissions of waste sent to the landfill during the reporting year (see Question 8.2.30). [GHGP S3 p 44]

Example 8.7.10
Identifying waste generated in operations emissions

Property Manager has a service agreement with a waste management entity, which collects accumulated tenant waste from properties on a weekly basis. All waste is sent to the landfill for disposal.

Property Manager includes the emissions associated with the future emissions of waste sent to the landfill during the reporting year in scope 3-category 5.

Question 8.7.20
How are waste generated in operations emissions calculated?

Interpretive response: There are three methods to calculate scope 3 emissions from waste generated in operations. [GHGP S3C p 73]

Calculation method	Formula
Supplier-specific	Collect waste-specific emission data directly from waste treatment provided
Waste-type-specific	Waste type × Emission factor
Average-data	Total waste per treatment method × Average emission factor

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate. See Question 8.2.40.

Example 8.7.20
Calculating waste generated in operations emissions using the waste-type-specific method

Hotel generates three broad categories of waste: plastic, general waste and paper. Plastic is recycled, generate waste is sent to landfill and paper is incinerated.

Hotel includes in scope 3-category 5 the emissions related to the disposal of these waste categories.

Using the waste-type-specific method, the formula to calculate emissions associated with waste generated in operations during the reporting period is:

Activity data: Σ (waste produced (tonnes or m^3))
×
Waste type and waste treatment specific emission factor (kg CO_2e/tonne or m^3)

To perform this calculation, Hotel gathers the following information.

Waste type	Waste treatment	Data	Source	Data	Unit
Plastic	Recycled	Activity data	Waste Hauler Report	750	Tonnes
		Emission factor	National Emission Factor Report	0.2	tCO_2e / tonne
General waste	Landfill	Activity data	Waste Hauler Report	2,500	Tonnes
		Emission factor	National Emission Factor Report	1.5	tCO_2e / tonne
Office and mixed paper	Incinerated	Activity data	Waste Hauler Report	20	Tonnes
		Emission factor	National Emission Factor Report	0.4	tCO_2e / tonne

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
(750 × 0.2) + (2,500 × 1.5) + (20 × 0.4) = **3,908 tCO_2e**

8.8 Category 6: Business travel

Question 8.8.10
What are business travel emissions (category 6)?

Interpretive response: Scope 3-category 6 accounts for emissions related to the transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the entity). Emissions sources may include air, rail, bus, automobiles and hotels. [GHGP S3 p 46]

The inclusion in category 6 of emissions from business travelers staying in hotels is optional. These are emissions related to the operations of a hotel

during a stay, allocated to an individual or room (based on its size). [GHGP S3 p 46]

The following table identifies emissions that may be related to business travel, but which are not included in scope 3-category 6.

Emissions source	Classification	Reference
Entity-owned vehicles	Scope 1 or 2	Chapters 6 and 7
Transportation of employees to and from work	Scope 3-category 7 (employee commuting)	Section 8.9
Leased vehicles	Scope 3-category 8 (upstream leased assets)	Question 8.2.20

Question 8.8.20
How are business travel emissions calculated?

Interpretive response: There are three methods used to calculate scope 3 emissions from business travel. [GHGP S3C p 82]

Calculation method	Formula
Fuel-based	Fuel consumed × Emission factor
Distance-based	Distance × Emission factor
Spend-based	Cost × Secondary (EEIO) emission factor

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate and for that reason, the distance-based calculation method is generally the most common. See Question 8.2.40.

Example 8.8.10
Calculating business travel emissions using the distance-based method

Hotel's executive and corporate events teams, among others, regularly travel for work purposes. Hotel includes the associated emissions in scope 3-category 6.

Using the distance-based method, the formula to calculate emissions associated with business travel during the reporting period is:

Activity data: Σ (distance traveled by vehicle type (vehicle-km or passenger-km))
×
Vehicle-specific emission factor (kg CO_2e/vehicle-km or kg CO_2e/passenger-km)

To perform this calculation, Hotel gathers the following information.

Type	Source	Data	Unit
Activity data	Travel records	3,245,000	miles
Emission factor	National Emission Factor Report	0.000088	tCO_2e per mile

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
3,245,000 miles × 0.000088 tCO_2e per mile = **286 tCO_2e**

8.9 Category 7: Employee commuting

Question 8.9.10
What are employee commuting emissions (category 7)?

Interpretive response: Scope 3-category 7 accounts for emissions related to the transportation of employees between their homes and worksites. Emissions sources may include air, rail, bus, automobiles and remote working – e.g. employee electricity consumption at their personal residence. [GHGP S3 p 46]

This category can optionally include (i.e. they are not required) the following: [GHGP S3 p 57]

- employees of other relevant entities that are outside the organizational boundary – e.g. franchises, outsourced operations; and
- consultants, contractors and other individuals who are not employed by the entity but who commute to facilities owned and operated by the entity.

Example 8.9.10
Identifying employee commuting emissions

The following example illustrates two scenarios of activities that are included in scope 3-category 7.

Scenario 1: Work commute

Hotel's employees commute via local bus service to the office four days a week. The emissions associated with the bus are included in scope 3-category 7.

Scenario 2: Remote work (optional reporting)

Hotel's employees work remotely three days a week. The additional activities resulting from remote work (e.g. heating or air conditioning during the day) are included in scope 3-category 7. However, activities that would occur regardless of an employee working remotely (e.g. refrigeration energy) are not included.

Question 8.9.20
How are employee commuting emissions calculated?

Interpretive response: There are three methods used to calculate scope 3 emissions from employee commuting. [GHGP S3C p 87]

Calculation method	Formula
Fuel-based	Fuel consumed × Emission factor
Distance-based	Distance × Emission factor
Average-data	Average data on commuting patterns

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate (see Question 8.2.40). Because of the availability of national data on employee commuting patterns in many countries, in our experience the average-data method is common.

Example 8.9.20
Calculating employee commuting emissions using the average-data method

Hotel has 150 employees that commute from their homes to the worksites using personal modes of transport. Hotel includes in scope 3-category 7 the emissions associated with these commutes.

Using the average-data method, the formula to calculate emissions associated with employee commuting during the reporting period is:

Activity data: Σ (total number of employees × % of employees using mode of transport)
×
Round-trip commuting distance (vehicle-m or passenger-m) × working days per year × emission factor of transport mode (kg CO_2e/vehicle-m or kg CO_2e/passenger-m)

To perform this calculation, Hotel gathers the following information.

Type	Source	Data	Unit
Activity data	Headcount	150	Employees

Type	Source	Data	Unit
	Regional statistics (average commuting distance round trip)	57	miles
	Calendar (working days per year, inclusive of holidays and personal days)	230	days
Emission factor	National Emission Factor Report (gasoline car)	0.00021	tCO_2e/m

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
(150 employees × 100% × 57 miles × 230) x 0.00021 = **310 tCO_2e**

Question 8.9.30**
Can teleworking emissions be included in category 7?

Interpretive response: Yes. GHGP offers an optional measurement technique for employee teleworking (i.e. work from home or remote work). The suggested method uses an estimated quantity of energy consumed by the employee and the relevant emission factor for the energy source. [GHGP S3C p 8]

8.10 Category 8: Upstream leased assets

Question 8.10.10
What are upstream leased asset emissions (category 8)?

Interpretive response: Scope 3-category 8 accounts for emissions that are leased by the entity in the reporting year and not already included in scopes 1 and 2. This category applies to lessees only. [GHGP S3 p 47]

The inclusion in scope 3 of emissions from leased assets depends on the approach chosen for an entity's organizational boundary (see Question 4.3.20). [GHGP S3 p 47]

8.11 Category 9: Downstream transportation and distribution

Question 8.11.10
What are downstream transportation and distribution emissions (category 9)?

Interpretive response: Scope 3-category 9 accounts for emissions related to transportation and distribution of sold products in the reporting year. This category also includes future emissions from retail and storage (see Question 8.2.30). [GHGP S3 p 47]

Example 8.11.10
Identifying downstream transportation and distribution emissions

Paper manufactures office paper that is sold at office supply retailers. The office paper is transported from Paper to Retailer using a third-party transportation service. The emissions associated with the transportation and distribution of the paper are accounted for differently depending on whether Paper pays for the transportation.

The following table, adapted from the Scope 3 Calculation Guidance, illustrates how Paper accounts for the scope 3 emissions from the transportation and distribution of sold products. [GHGP S3C p 103]

Scenario	Transportation	Retailer
Paper does not pay for transportation	Scope 3-category 9 (*upstream* transportation and distribution)	Scope 3-category 9 (*upstream* transportation and distribution)
Paper does pay for transportation	Scope 3-category 4 (*downstream* transportation and distribution)	Scope 3-category 9 (*upstream* transportation and distribution)

Question 8.11.20
How are downstream transportation and distribution emissions calculated?

The calculation methods for category 9 are consistent with category 4. See Question 8.6.20.

8.12 Category 10: Processing of sold products

Question 8.12.10
What are processing of sold products emissions (category 10)?

Interpretive response: Scope 3-category 10 accounts for emissions related to the processing of sold products that require further processing or inclusion in another product once sold before use by the end consumer. [GHGP S3 p 47]

The GHGP acknowledges that an entity may sell products to many intermediary third parties, and is therefore unable to estimate emissions associated with processing prior to end use. [GHGP S3 p 47]

In such cases, an entity may disclose and justify its exclusion of reporting category 10. [GHGP S3 p 60]

Question 8.12.20
How are processing of sold products emissions calculated?

Interpretive response: There are two methods used to calculate scope 3 emissions from processing of sold products. [GHGP S3C p 107]

Calculation method	Description
Site-specific method	Third-party processing emissions data
Average-data method	Estimation based on secondary data – e.g. average emissions per product

A single method or a combination of methods can be used to calculate emissions. [GHGP S3C p 13]

Data availability will likely determine which methods are most appropriate. See Question 8.2.40.

Example 8.12.10
Identifying and calculating processing of sold products emissions using the average-data method

Timber sells wood to a bed manufacturer, where the wood is processed to build a bed that is sold to end consumers. Timber obtains from the manufacturer an average emission factor for the production of a bed. Timber includes the emissions associated with the manufacturing and packaging of a bed in scope 3-category 10.

Using the average-data method, the formula to calculate emissions associated with processing of sold products during the reporting period is:

Sum across all intermediate products:

Activity data: Σ (mass of sold intermediate product (kg))
×
Emission factor of processing of sold products (kg CO_2e/kg of final product)

To perform this calculation, Timber gathers the following information.

Type	Source	Data	Unit
Activity data	Manufacturer	450	tonnes
Emission factor	National Emission Factor Report	1.3	tCO_2e / t

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
450 tonnes × 1.3 tCO_2e/t = **585 tCO_2e**

8.13 Category 11: Use of sold products

Question 8.13.10
What are use of sold products emissions (category 11)?

Interpretive response: Scope 3-category 11 accounts for emissions related to the use of goods and services sold (to end users including consumers and business customers) by the entity in the reporting year. End users include both consumers and business customers that use final products. This includes all lifetime emissions following the point of sale of a product (see Question 8.2.30). [GHGP S3 p 48]

There are two types of emissions from the use of sold products: [GHGP S3 p 48]

- **direct use-phase emissions** – e.g. emissions of expected fuel use in the lifetime of planes a manufacturer sells to airline providers; and
- **indirect use-phase emissions** – e.g. emissions associated with energy required for washing and drying clothing a manufacturer sells to consumers.

Entities are required to include direct use-phase emissions in category 11, but the inclusion of indirect use-phase is optional. In addition, it is optional to include emissions associated with the maintenance of sold products during use. [GHGP S3 p 48]

Question 8.13.20
How are use of sold products emissions calculated?

Interpretive response: There are three direct use-phase subcategories under which a sold product may fall. [GHGP S3C p 114]

Subcategory	Examples
Products that directly consume energy	Cars, washing machines, televisions
Fuels and feedstock	Crude oil, coal, biofuels
GHG and products that contain or form GHG that are emitted during use	HVAC, refrigerators, fire extinguishers

To calculate optional indirect use-phase emissions, an entity creates or obtains a typical use-phase profile over the lifetime of the product and multiplies by relevant emission factors. [GHGP S3C p 120]

Each category has a calculation methodology, as detailed in the GHGP Scope 3 Calculation Guidance, which is outside the scope of this handbook.

8.14 Category 12: End-of-life treatment of sold products

Question 8.14.10
What are end-of-life treatment of sold products emissions (category 12)?

Interpretive response: Scope 3-category 12 accounts for the emissions related to the end-of-life treatment of sold products sold in the reporting year. [GHGP S3 p 49]

Category 12 shares similarities to category 5 (waste generated in operations), with consistent end-of-life treatment methods – e.g. landfill, recycling. See section 8.7.

Example 8.14.10
Identifying end-of-life treatment of sold products emissions

Cellphone Manufacturer sells 100 million cellphones during the reporting year, with an expected average lifetime of four years following sale to end consumers.

The cellphone manufacturer predicts consumers will dispose of cellphones via either landfill or a recycling program. The estimated emissions associated with landfill disposal and recycling treatment are included in scope 3-category 12.

Question 8.14.20
How are end-of-life treatment of sold products emissions calculated?

Interpretive response: The calculation methods for category 12 are consistent with category 5. See Question 8.7.20.

8.15 Category 13: Downstream leased assets

Question 8.15.10
What are downstream leased asset emissions (category 13)?

Interpretive response: Scope 3-category 8 accounts for emissions that are leased by the entity in the reporting year and not already included in scopes 1 and 2. This category applies to lessors only. [GHGP S3 p 50]

The inclusion in scope 3 of emissions from leased assets depends on the approach chosen for an entity's organizational boundary (see Question 4.3.20). [GHGP S3 p 50]

8.16 Category 14: Franchises

Question 8.16.10
What are franchise emissions (category 14)?

Interpretive response: Scope 3-category 14 accounts for the emissions related to franchise operations that are not otherwise included in scopes 1 or 2. This category applies to franchisors only. [GHGP S3 p 51]

A franchisor sells or grants a franchise license to a franchisee for the sale of goods or the operation of a service. The franchisor owns trademarks and business models and receives payments from entities who hold the franchise license. [GHGP S3 p 138]

The following table shows how the emissions associated with a franchise are classified by each party. [GHGP S3 p 51]

Emissions source	Party	Classification
Franchise operations	Franchisee	Scopes 1 and 2 emissions
	Franchisor	Scope 3-category 14
Franchisor operations	Franchisee	Scope 3-category 1 (purchased goods and services)[1]

Note:

1. Optional under scope 3-category 1.

Question 8.16.20
How are franchise emissions calculated?

Interpretive response: There are two methods used to calculate scope 3 emissions from franchises. [GHGP S3C p 130]

Calculation method	Description
Franchise-specific method	Collecting site-specific data activity
Average-data method	Estimation based on average statistics (e.g. average emissions per square foot)

A single method or a combination of methods can be used to calculate emissions. Data availability will likely determine which methods are most appropriate. See Question 8.2.40. [GHGP S3C p 13]

Example 8.16.10
Identifying and calculating franchise emissions using the average-data method

Hotel operates a franchise-based model. It grants a franchise license to hotel operators, which includes use of the brand name. Hotel includes the emissions associated with the operations of each hotel using its franchise license in scope 3-category 14.

Using the average-data method, the formula to calculate emissions associated with franchises during the reporting period is:

Sum across building types:

Activity data: Σ (total floor space of building type (m^3))
×
Average emission factor for building type (kg CO_2e/m^3/year)

To perform this calculation, Hotel gathers the following information.

Franchise	Source	Data	Unit	Emission factor (tCO_2e / sq ft)
Franchise A	Floor plan	40,000	sq ft	0.007
Franchise B		50,000		
Franchise C		100,000		

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
(40,000 + 50,000 + 100,000) × 0.007 = **1,330 tCO_2e**

8.17 Category 15: Investments

Question 8.17.10
What are investment emissions (category 15)?

Interpretive response: Scope 3-category 15 accounts for the emissions related to investments in the reporting year. The category applies to investors and entities that provide financial services. [GHGP S3 p 51]

Investments may be included in scope 1 or 2 depending on the organizational boundary applied (see section 3.2). [GHGP S3 p 51]

A common name used in the financial industry for emissions in this category is ‘financed emissions’.

The GHGP Scope 3 Standard covers four investment asset classes: [GHGP S3 p 51]

- equity investments
- debt investments
- project finance
- managed investments and client services.

Question 8.17.20
How are investment emissions calculated?

Interpretive response: Investment emissions are allocated to the entity based on its proportional share of the underlying investment in the investee. [GHGP S3C p 137]

Investments reported in category 15 emissions are identified by choosing a fixed point in time (e.g. December 31) or using a representative average over the course of the reporting year. [GHGP S3C p 137]

Each asset class has a calculation methodology, as detailed in the GHGP Scope 3 Calculation Guidance, which is outside the scope of this handbook.

In 2020, the Partnership for Carbon Accounting Financials (PCAF) published The Global GHG Accounting and Reporting Standard for the Financial Industry, which provides emission calculation guidance for a wider range of asset classes. The first edition of the Standard was reviewed by the GHGP and is in conformance with the requirements of the Scope 3 Guidance. The second edition of the Standard, released in December 2022, is pending GHGP review and approval. Inventory preparers with significant scope 3-category 15 emissions may wish to consider the PCAF Standard when preparing financed emissions.

Example 8.17.10
Identifying and calculating investment emissions

Investment Manager, which primarily provides investment advisory services to clients, has a small portfolio of four investments on its balance sheet at December 31.

Investment Manager obtains investee scopes 1 and 2 emissions from publicly available GHG reporting by each underlying investment entity and the equity share from financial records.

The formula to calculate emissions associated with investments during the reporting period is:

Sum across investees:

Activity data: Σ (scope 1 and scope 2 emissions of investments)
×
Share of equity %)

To perform this calculation, Investment Manager gathers the following information.

Investment	Scopes 1 and 2 emissions in reporting year (tCO_2e)	% equity share
Maple Leaf Inc	45,000	35
Thistle Inc	70,000	15
Rose Inc	100,000	10
Cherry Blossom Inc	20,000	25

Based on this data, emissions are calculated as:

Activity data × Emission factor = tCO_2e
(45,000 × 35%) + (70,000 × 15%) + (100,000 × 10%) + (20,000 × 25%)
= 15,750 + 10,500 + 10,000 + 5,000 = **41,250 tCO_2e**

Reporting landscape
Financed (investment) emissions

As shown in the following table, the frameworks take different approaches.

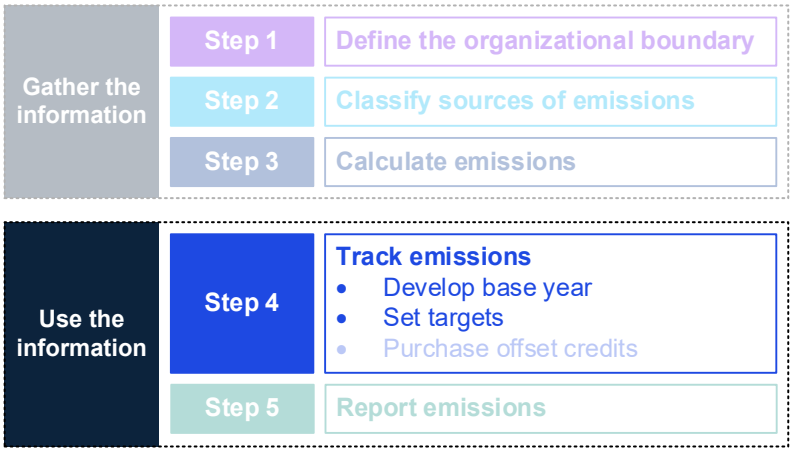
ISSB Standards	ESRS
Financed emissions disclosures are required if the entity's activities include commercial banking, insurance or asset management. [IFRS S2.29(a)(vi)(2), B59(a)-(c)] An entity discloses the methodology used, including how its share of emissions was allocated relative to investment size and its gross exposure. [IFRS S2.B61(d), B62(d), 63(d)]	Financial institutions are required to consider PCAF, specifically part A 'Financed Emissions' (version Dec 2022), when measuring gross scope 3 emissions. [ESRS E1.AR46(b)]

9. Tracking emissions and setting targets

Detailed contents

9.1 How the GHGP works

Until this point, the handbook has dealt with gathering the information necessary to create the GHG inventory. This chapter discusses tracking emissions, which is part of how the information is used.



Develop a base year

A base year is a benchmark that allows an entity to observe trends in emissions information. To maintain consistency, it may be necessary to recalculate the base year, and other historic, emissions. Such recalculations may be triggered by a variety of circumstances – e.g. acquisition, change in methodology.

Set reduction targets

GHG emissions reduction targets are increasingly used by entities that commit to reduce GHG emissions by a certain amount by a certain year. The terms ‘net-zero’ and ‘carbon neutral’ are frequently used to identify a GHG emissions reduction commitment.

9.2 The base year and tracking emissions

Question 9.2.10
How are emissions tracked over time?

Interpretive response: To make meaningful and consistent comparisons of emissions over time, an entity sets a base year (see Question 9.2.20) to which it compares current emissions. Such comparisons may support a variety of business goals – e.g. reporting, target setting, risk management. [GHGP p 35]

A base year is a benchmark that allows an entity to observe trends in emissions information. To maintain consistency, it may be necessary to recalculate base year, and other historic, emissions. Such recalculations may be triggered by a variety of changes to the entity. See Question 9.2.30.

Question 9.2.20
How is a base year chosen?

Interpretive response: Absent reporting requirements (e.g. SBTi's Net-Zero Standard requires a base year no earlier than 2015; see Question 9.3.50), the following steps provide guidelines for choosing a base year.

First, the entity decides whether to select one base year for its entire emissions inventory or different base years for each source of emissions – e.g. scope 1, scope 2, scope 3.

Second, the entity selects an approach for calculating base year emissions. [GHGP p 35]

- **Single year:** Select one single year against which to compare all future emissions.
- **Multi-year:** Average annual emissions data over a set number of consecutive years.

Third, the entity selects the base year. Typically this is the earliest relevant point for which reliable data is available. [GHGP p 36]

A base year can be changed, but it may affect future inventory comparisons. For example, an entity may need to reconsider its base year if it has an acquisition for which historical data is unavailable. See Question 9.2.30.

The inventory base year may also be used as the target base year (see Question 9.3.30).

Example 9.2.10
Setting a base year

Hotel set its base year as 2019 for scopes 1, 2 and 3 emissions. The following table shows the base year emissions and the comparison one year later. Hotel would continue tracking in future years to reveal the trend in its emissions over time.

Measures in tCO_2e	2019 (base year)	2020	Trend
Scope 1	1	0.8	-20%
Scope 2	3	4.5	+50%
Scope 3	6	7.5	+25%

Question 9.2.30
When are recalculations necessary?

Interpretive response: To maintain consistency over time ('like with like') so that meaningful emissions comparisons can be made, it may be necessary to recalculate historic emissions; such recalculations may impact historic emissions, including base year emissions. To reflect changes in the entity that would otherwise compromise the consistency and relevance of GHG emissions information, historic emissions are retroactively recalculated. [GHGP p 34]

Recalculations may be triggered by:

- the rapid evolution in sustainability reporting – e.g. new data, new measurements, new methodologies; or
- structural changes within the entity itself – e.g. divestments.

A historic emissions recalculation may be necessary in the following circumstances, if they are significant (see Question 9.2.40): [GHGP p 35]

- improvements in the accuracy of emission factors or other data;
- discovery of errors;
- outsourcing or insourcing of emitting activities;
- refinement in the calculation methodology applied; and/or
- a structural change in the entity (e.g. merger, acquisition, divestment).

In addition, new scope 3 categories may be added to the operational boundary in the current year (see chapter 4) with prior year information added for comparability.

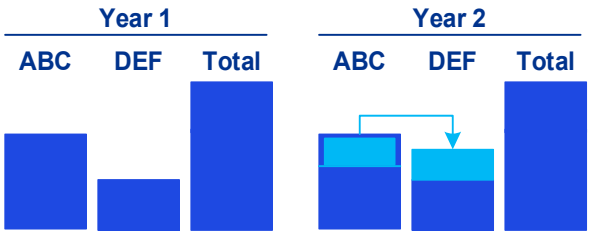
A historic emissions recalculation is not made in the following circumstances: [GHGP pp 38-39]

- changes (e.g. acquisition) involving facilities or operations that did not exist in base year;

- organic growth or decline from increases or decreases in production output, change in product mix, and closures or openings of operating units owned or controlled by the entity; and
- outsourcing or insourcing if the relevant indirect emissions are reported.

The example in Appendix B includes illustrative disclosures when a recalculation is triggered.

The following diagram illustrates the philosophy of the GHGP in requiring recalculations. If ABC sells part of its business to DEF, total emissions have not changed – they have simply been redistributed between the two entities. By recalculating past emissions for the effect of the transaction (disposal for ABE and acquisition for DEF), the emissions tracking over time maintains its integrity relative to the current year.



However, if DEF built a new plant instead of acquiring it from ABC, total emissions would increase and therefore there is no recalculation.

This approach is very different from financial reporting and means that recalculations of prior year information can be common in GHG emissions reporting, and it does not mean that there was an error in prior period information. However, historical emissions are not recalculated if they fall below a 'significance threshold'.

Question 9.2.40
What is a significance threshold?

Interpretive response: A significance threshold is a point at which a recalculation of historic emissions is triggered. When a significance threshold has been reached, historic emissions are recalculated. A significance threshold comprises qualitative and/or quantitative criteria (and it may be based on cumulative changes) that an entity establishes in a recalculation policy. Particular care should be taken in assessing the qualitative nature of errors that are discovered. This threshold is at the entity's discretion and is not prescribed by the GHGP. [GHGP p 35]

As defined in the GHGP Scope 3 Standard, significant changes result not only from single large changes, but also from several small changes that are cumulatively significant. [GHGP S3 p 104]

Although the GHGP makes no specific recommendation as to what constitutes 'significant', some external GHG programs may specify certain numerical thresholds.

Example 9.2.20
Recalculating prior year emissions

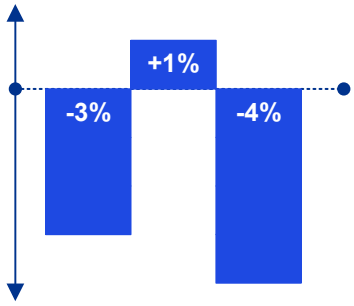
Hotel establishes an emissions recalculation policy that defines a significance threshold of 5%. Any positive or negative changes outside the 5% threshold are considered significant and trigger a recalculation.

Scenario 1: The cumulative impact of multiple events triggers a base year recalculation

In the current year, Hotel monitors the following events.

- Operations makes a recommendation to change the calculation methodology. For consistency purposes, the change will also be made in the base year. This results in a 3% decrease in total base year emissions.
- Internal Audit discovers an error in the current year emissions calculation and determines that the same error was made in the base year calculation. This results in a 1% increase in total base year emissions.
- Management divests from a manufacturing facility. This results in a 4% decrease in total base year emissions.

Individually, none of these changes exceed the 5% significance threshold. However, cumulatively the 5% significance threshold is exceeded and Hotel determines a base year recalculation is necessary.



Scenario 2: A single event triggers a base year recalculation

Hotel purchased Subsidiary in 2023. The purchase resulted in an increase in the emissions within Hotel's inventory boundary. Because this increase exceeded Hotel's significance threshold, Hotel determined it necessary to recalculate prior year emissions.

Hotel's prior year emissions have been recalculated to reflect the inclusion of Subsidiary's emissions.

Measures in tCO_2e	2019 (base year)	2019 (subsidiary)	2019 (adjusted base year)
Scope 1	1	0.2	1.2
Scope 2	3	0.5	3.5
Scope 3	6	2	8

9.3 Goals and targets

Question 9.3.10
What is a GHG emissions target?

Interpretive response: A GHG emissions reduction target is a planning tool that can be used to manage GHG risks, enhance cost savings and drive research and development. GHG emissions targets are increasingly used by entities that commit to reduce GHG emissions by a certain amount by a certain year. The rest of this section discusses the different types of targets and some of the common phrases used by entities in making commitments – e.g. net zero.

Question 9.3.20
What are the steps in setting a GHG emissions target?

Interpretive response: Target-setting is a process that is informed by relevant policy and stakeholder discussions. It is typically an iterative process involving the following steps.

Excerpt from GHGP Corporate Standard [p 75]

Steps in setting a GHG target:

1. Obtain senior management commitment
2. Decide on the target type
3. Decide on the target boundary
4. Choose the target base year
5. Define a target completion date
6. Define the length of the target commitment period

7. Decide on the use of offsets or credits
8. Establish a target double counting policy
9. Decide on the target level
10. Track and report progress

This remainder of this chapter focuses on Steps 2 and 7.

Question 9.3.30
What are the different GHG emissions target types?

Interpretive response: The two types of GHG emissions targets are absolute and intensity-based. [GHGP p 77]

- **Absolute targets** refer to reductions of absolute emissions over time – e.g. 50% reduction in the entity's scope 1 emissions by 2030.
- **Intensity targets** refer to reductions of the ratio of emissions relative to a business metric over time – e.g. 50% reduction in the entity's scope 1 emissions intensity per square foot of facility space by 2030.

An entity chooses the type of reduction target that make sense for its operations and reporting goals. It may focus on tracking a year-over-year trend (absolute or intensity) within the entity or it may focus on comparing (or benchmarking) its own intensity metrics to that of peers. Some entities may have multiple targets, both absolute and intensity-based.

Even with decreased GHG intensity, absolute emissions may still rise. An entity may meet an intensity target by improving energy efficiency throughout its facilities, while also building more facilities that increase consumption and lead to a rise in absolute emissions.

Intensity metrics

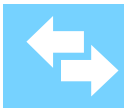
There is no standard metric upon which to base an intensity value. This is because of the significant diversity in what entities do and how they do it. Unless production processes are homogenous, it is difficult to develop indicators that allow for useful comparisons across facilities or entities.

In our experience, common denominators for intensity metrics are:

- production output – e.g. mileage, kWh, metric tonnes of products;
- financial basis – e.g. revenue, costs; and
- other – e.g. office space.

An entity chooses a denominator that allows for meaningful tracking of a trend for the intended purpose – e.g. measuring progress toward a reduction target. It

is important to understand the context for an intensity metric when using it for analyses and comparisons.



Reporting landscape
GHG intensity metrics

As shown in the following table, only ESRS require disclosure of GHG intensity metrics in all cases.

ISSB	ESRS
No explicit requirement. However, an entity discloses GHG intensity metrics if such metrics are determined to be useful to users of general purpose financial reports. [IFRS S1.15(b), IFRS S2.BC84]	An entity discloses total GHG emissions in metric tonnes of CO_2e per net revenue. [ESRS E1.53] The intensity metric is calculated using total GHG emissions measured using the location-based and total GHG emissions measured using the market-based method. [ESRS E1.AR53(b)]

Question 9.3.40
What is a science-based target?

Interpretive response: A target is considered 'science-based' if it is in line with what the latest climate science (e.g. IPCC) says is necessary to meet the goals of the Paris Agreement – limiting global warming to 1.5 degrees Celsius above pre-industrial levels.

There are several science-based target frameworks, the most commonly known being the Science Based Targets initiative (SBTi).

SBTi provides guidance and tools for entities to set science-based targets (SBTs) by, among other things, defining and promoting best practice in SBT-setting across sectors. SBT submissions are validated against the SBTi's science-based criteria.

According to the SBTi Criteria guidance, near-term SBTs need to:

- cover a minimum of 5 years and a maximum of 10 years from the date the target is submitted to the SBTi;
- follow the GHGP Corporate Standard, Scope 2 Guidance and Scope 3 Standard (to the extent scope 3 categories are included);
- cover scopes 1 and 2;

- cover scope 3 for entities whose scope 3 emissions cover more than 40% of their combined scope 1, 2 and 3 emissions;
- be based on emissions reductions through direct action within the entity's own boundaries or value chains (see chapter 4);
- not count avoided emissions (see Question 10.3.10);
- not count offsets (see Question 10.3.10); and
- only count renewable instruments such as RECs to meet reductions of scope 2 emissions using the market-based approach (see Question 7.3.10).

The SBTi recommends that annually entities publicly disclose their emissions inventory and progress against their targets – e.g. in the annual report, sustainability report, corporate website, CDP annual questionnaire.

The SBTi is currently developing a process to track entity progress against targets and plans to issue more specific guidance on annual reporting requirements for entities.

Question 9.3.50
What is the difference between carbon neutral and net-zero?

Interpretive response: The terms 'net-zero' and 'carbon neutral' are frequently used to identify a GHG emissions reduction commitment. The United Nations Framework Convention on Climate Change (UNFCCC) has developed definitions for these two terms, among others, which are commonly used in sustainability reporting.

The 'Race to Zero Lexicon' is not intended to be a mandate for standardization, but was created to facilitate further alignment of how terms are used in reporting to limit user confusion. Many of the definitions refer to the IPCC definitions. There are various other frameworks that also define these terms – e.g. Net Zero Initiative Framework, ISO Net Zero Guidelines.

Because each term may be defined differently, it is important for the entity to:

- have a clear understanding of the terms used in making commitments; and
- consider regulatory and jurisdictional implications – e.g. an EU directive on 'green claims' was proposed in 2023 and is progressing through the legislative process. [EU Briefing]

The following table compares the two concepts, leveraging the carbon neutral definition from PAS 2060 and the net-zero definition from SBTi.

	Carbon neutral	Net-zero SBTi
Overview	Reduce emissions through a target-driven carbon management plan	Reduce emissions in line with 1.5-degree Celsius pathway – i.e.

	Carbon neutral	Net-zero SBTi
		consistent with the Paris Agreement (see Question 2.2.10)
Use of offsets	Residual carbon emissions can be offset by high quality certified carbon credits	Residual emissions can be offset by carbon removal projects or credits
Scope	Scopes 1 and 2, and scope 3 emissions that contribute more than 1% of the total footprint	Scopes 1, 2 and 3
Gases	Includes all GHGs	Includes all GHGs
Boundary	Can refer to a specific product or service, or the whole entity	Encompasses the whole entity
Types of offsets	Carbon reduction, avoidance or removal projects	Carbon removal projects
Applicable standard	PAS 2060	SBTi Corporate Net-Zero Standard

Entities that commit to emissions reduction targets often have discretion in the extent and ambition of those targets. These targets are often influenced by regulators, public policy and other stakeholders.

For example, many signatories to the Paris Agreement have set net-zero targets. These targets align with the IPCC's 2018 Special Report on Global Warming of 1.5 degrees Celsius, which explains that to limit the global temperature increase to 1.5 degrees Celsius, global net anthropogenic CO_2 emissions need to decline by about 45% from 2010 levels by 2030, reaching net-zero around 2050.

As more countries set targets in line with this goal, more entities are facing pressure to set similar targets.

Scope 2

Many entities set a target for scope 2 market-based emissions because the only way to reduce scope 2 location-based emissions is to reduce overall energy usage, or potentially increase on-site renewable generation used directly on the entity's premises. The market-based approach allows an entity to take credit for green electricity purchases, giving it more options to demonstrate a reduction in reported emissions. See Example 7.2.30.

The difference between Scope 2 market-based versus location-based emissions is discussed in section 7.2.

Example 9.3.10
Differentiating between carbon neutral and net-zero targets

The following are example policies.

Restaurant has established a carbon neutral target

We have signed the UN's carbon neutral pledge and are committed to reducing our carbon footprint to the extent possible. We are reducing our carbon footprint by serving a vegan menu and using stipends to incentivize employee use of public transportation. We offset unavoidable emissions through investment in a carbon reduction project to develop fuel-efficient cookstoves in Africa.

Hotel has established a net-zero target

We plan to achieve net-zero GHG emissions by the end of 2035, and every year thereafter. We will start by reducing emissions within our organizational boundary. For emissions we cannot avoid, we plan to fully neutralize them by investing in forest conservation projects that prevent carbon from entering the atmosphere. We will further invest in grassland restoration projects that capture and store carbon. These actions are consistent with SBTi obligations for 90% reductions and carbon removal offsets on the remaining 10% of emissions.

Reporting landscape
GHG emissions targets

As shown in the following table, IFRS Sustainability Disclosure Standards and ESRS require disclosure about any targets or goals that have been set.

ISSB	ESRS
An entity discloses any targets it has set to assess progress toward achieving its strategic goals, and any targets it is required to meet by law or regulation. Specified information is disclosed in relation to those targets – e.g. the period over which the target applies, the base period from which progress is measured. [IFRS S2.33–36]	An entity discloses whether and how it has set GHG emissions reduction targets and, if it has, specified information is disclosed – e.g. the targets disclosed in absolute value and, where relevant, in intensity value; the targets disclosed for scopes 1, 2 and 3 emissions either separately or combined; the base year and baseline value; whether the targets are science-based and compatible with limiting global warming to 1.5 degrees Celsius. [ESRS E1.33-34] If a net-zero target has been set, an entity discloses the scope, methodologies and frameworks applied and how residual emissions (after 90-95% reduction) will be neutralized – e.g. GHG removals in the entity's own operations and its

ISSB	ESRS
	upstream and downstream value chain. [ESRS E1.60]

10. Offset credits

Detailed contents

Item significantly updated in this edition #

Examples

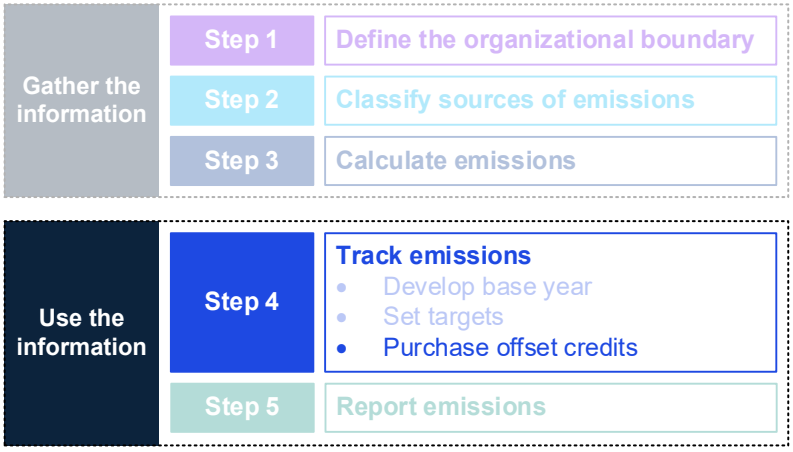
Reporting landscape: ISSB, ESRS

Offset credibility

Future developments #

10.1 How the GHGP works

Having provided an overview of how emissions are tracked in chapter 9, this chapter looks more closely at the use of offset credits to meet GHG emissions targets. This chapter provides a foundational overview of how offset credits originate.



Once an entity sets a GHG emissions reduction target, it actions an emissions reduction plan to reduce the gross emissions within its inventory boundary as much as possible. As the plan progresses over time, the entity may plan to purchase offset credits that compensate for residual emissions that cannot be eliminated.

Offset credits are the result of GHG project implementation. The GHGP Project Standard provides guidance for quantifying and reporting GHG reductions from GHG projects. Although this kind of accounting is separate and distinct from the accounting for GHG inventories, there is a connection between the two.

The output of project accounting (offset credit) may be an input into a corporate emissions inventory report if the entity elects to use offset credits. Offset credits are not part of the calculation of gross emissions, but instead are presented separately in an entity's emissions statement.

Corporate emissions inventory		Project accounting
the inventory boundary	**Define**	the assessment boundary
actual emissions for each source within the boundary	**Estimate**	baseline (hypothetical) emissions
all emissions within the boundary	**Total**	difference between baseline emissions and project emissions
purchase offset credits	**Transact**	sell offset credits

10.2 GHG offsets and projects

Question 10.2.10
How are GHG offsets referred to in practice?

Interpretive response: In our experience, there are differences between the technical explanations of offsets under the GHGP and the use of offset terminology for financial reporting purposes.

This chapter refers to the following.

- **Scope 2 contractual instruments.** These are certificates or other evidence that allow the receiving entity to take credit for the use of renewable energy (RECs in the US market). These instruments are an inherent part of scope 2 market-based emissions calculations. See chapter 7.
- **Offset credits.** These are instruments used by entities to reduce their reported emissions footprint. They are not part of the calculation of gross emissions, but instead are presented separately in an entity's emissions statement (see Question 10.3.50).

The remainder of this chapter adheres to the terminology presented in the GHGP standards – GHG offset and offset credit – while acknowledging that other terms may be used interchangeably to mean the same thing. GHG offsets may be related to a reduction, removal or avoided GHG emission. This chapter sometimes uses the term 'reduction' where removal or avoided GHG emission could be used instead.

Reporting landscape
GHG offsets

As shown in the following table, terminology differs.

ISSB	ESRS
Refers to 'carbon credit' as an "emissions unit that is issued by a carbon crediting programme and represents an emission reduction or removal of greenhouse gases. Carbon credits are uniquely serialised, issued, tracked and cancelled by means of an electronic registry." Carbon credits are transferrable or tradeable instruments. [IFRS S2.A, B70]	Refers to 'carbon credit' as "a transferable or tradeable instrument that represents one metric tonne of CO_2e emission reduction or removal and is issued and verified according to recognized quality standards." [ESRS Annex II, Table 2]

Question 10.2.20
What is a GHG offset?

Interpretive response: A GHG offset represents the reduction, removal or avoidance of GHG emissions from a specific GHG project that is used to offset GHG emissions that occur elsewhere. They may be used to meet a voluntary or mandatory GHG trade or cap. See Question 10.2.80. [GHGP p 59]

The following table depicts the types of projects from which GHG offsets may be derived.

Type	Avoidance	Removal
Definition	Reduce emissions to the atmosphere	Capture emissions from the atmosphere and store them via natural or technological processes
Method	Compare to what most likely would have happened absent the project	Via either natural or technological processes
Examples	Renewable energy, convert methane captured from landfill to energy, limit timber harvest levels	Reforestation, afforestation, direct air capture

Question 10.2.30
What is a GHG project?

Interpretive response: According to the GHGP Project Standard, a GHG project comprises a specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon or enhance GHG removals from the atmosphere. [GHGP PA p 11]

A project activity is a specific intervention intended to *change* GHG emissions, removals or storage. [GHGP PA p 11]

These changes are associated with processes that either: [GHGP PA p 11]

- release GHG emissions into the atmosphere (GHG source) – e.g. fossil-fuel powered vehicles; or
- remove and store GHG emissions from the atmosphere (GHG sinks) – e.g. trees.

These changes are either intentional (primary effects) or unintentional (secondary effects). For example, the primary effect of a reforestation project is to increase storage or removals of CO_2 and a secondary effect may be the release of GHG emissions from the machinery used to prepare the land for planting. [GHGP PA p 11]

Question 10.2.40
What is a GHG assessment boundary?

Interpretive response: The GHG assessment boundary comprises all of the primary and significant secondary effects associated with a GHG project. The primary and significant secondary effects are included within the assessment boundary regardless of whether they occur at GHG sources or sinks owned or controlled by the project entity. [GHGP PA p 12]

Within the assessment boundary, a GHG reduction is either a reduction in GHG emissions or an increase in removals or storage of GHGs from the atmosphere, relative to baseline emissions. [GHGP PA p 12]

Excerpt from GHGP Project Standard [p 29]

Defining the GHG assessment boundary

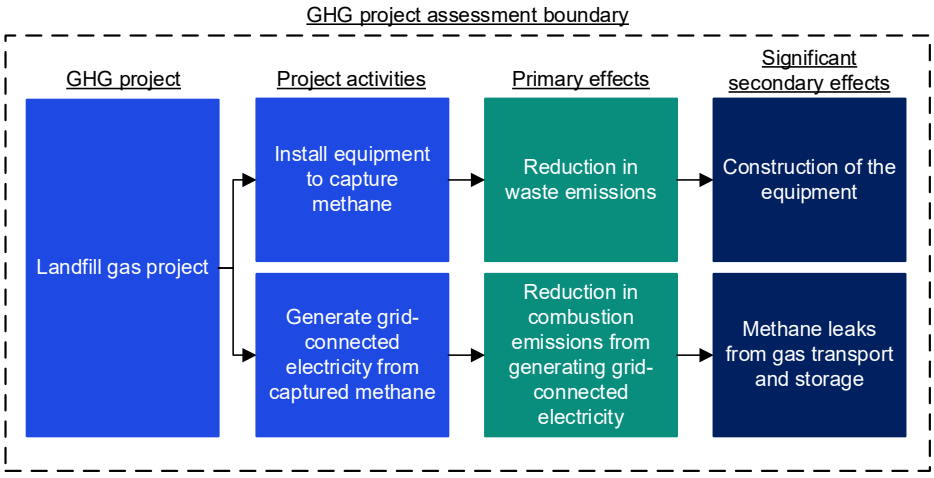
The GHG assessment boundary encompasses GHG effects, regardless of where they occur and who has control over the GHG sources or sinks associated with them. This inclusive GHG assessment boundary is intended to encourage a more comprehensive assessment of the GHG project's effect on GHG emissions and to minimize the possibility of overlooking any significant GHG effects that may occur outside the project's physical location or beyond the control of the project developer. However, what constitutes *significant* is left to the discretion of the project developer.

Example 10.2.10
Identifying the GHG assessment boundary

This following example has been adapted from the GHGP Project Standard by adding significant secondary effects. [GHGP PA p 31]

Project undertakes a project to capture methane gas at a landfill. This project captures GHGs that would otherwise be emitted to the atmosphere.

Project identifies the project's assessment boundary as follows.



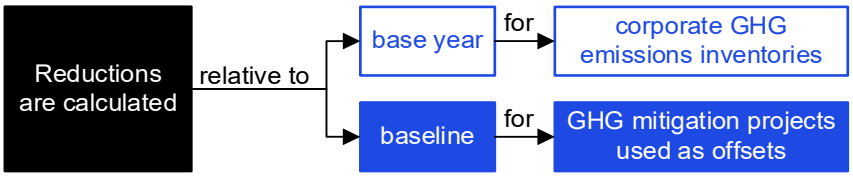
Insignificant secondary effects are outside the assessment boundary.

Question 10.2.50
How are GHG offsets quantified?

Interpretive response: GHG offsets are quantified relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the GHG project. The GHGP Project Standard focuses on the quantification of GHG reductions from GHG mitigation projects that will be used as offsets (see Question 10.2.20). [GHGP p 59]

This is different from reductions in a corporate emissions inventory, which calculates reductions by comparing changes in the entity's emissions inventory over time relative to a base year. The GHGP Corporate Standard focuses on the accounting and reporting of GHG emissions at the entity level. [GHGP p 59]

The following figure portrays how reductions are quantified differently in terms of GHG offsets versus corporate inventories.



Excerpt from GHGP Corporate Standard [p 59]

Reductions in indirect emissions

Reductions in indirect emissions (changes in scope 2 or 3 emissions over time) may not always capture the actual emissions reduction accurately. This is because there is not always a direct cause-effect relationship between the activity of the reporting company and the resulting GHG emissions.

For example, a reduction in air travel would reduce a company's scope 3 emissions. This reduction is usually quantified based on an average emission factor of fuel use per passenger.

However, how this reduction actually translates into a change in GHG emissions to the atmosphere would depend on a number of factors including whether another person takes the "empty seat" or whether this unused seat contributes to reduced air traffic over the long term.

Question 10.2.60
How are baseline emissions calculated?

Interpretive response: Baseline emissions are calculated using a baseline (or hypothetical) scenario of what would have most likely occurred in the absence of the GHG project. [GHGP PA p 12]

Baseline emissions associated with primary effects are derived from a baseline scenario, either developed via the project-specific standard or a performance standard. [GHGP PA p 13]

- A **project-specific standard** is linked to the specific circumstances of the project activity. [GHGP PA p 48]
- A **GHG emission performance standard** is not tied to the specific project activity; rather it represents an analysis of the GHG emission rates of all baseline candidates. An example may be energy efficiency. [GHGP PA p 60]

The GHGP Project Standard defines baseline candidates as alternative technologies (both existing and potential) or practices within a specified geographic area or temporal range that could provide the same product or service as the project activity. [GHGP PA p 38]

For example, for a project activity that substitutes a low GHG-emitting fuel for a high GHG-emitting fuel in vehicles, the service provided would be energy used for transportation, not transportation itself. Therefore, alternative fuels would be considered as baseline candidates, but alternative modes of transportation would not. [GHGP PA p 39]

Baseline emissions associated with secondary effects are estimated – e.g. using existing data or emission factors – and linked to the project-specific baseline scenario. [GHGP PA p 13]

Excerpt from GHGP Project Standard [pp 15-16]

Defining the GHG assessment boundary

Though the presumption is generally that a project activity differs from its baseline scenario, in some cases, a project activity (or the same technologies or practices it employs) may have been implemented "anyway." In these cases, the project activity and its baseline scenario are effectively identical.

While such a project activity may appear to reduce GHG emissions relative to historical emission levels, compared to its baseline scenario the project activity does not reduce GHG emissions. In the context of GHG programs, it is important to count only GHG reductions from project activities that differ from – or are additional to – their baseline scenarios.

Question 10.2.70
What is additionality?

Interpretive response: Distinguishing a project activity from its baseline scenario is referred to as determining additionality. [GHGP PA p 16]

Additionality means beyond 'business as usual'. Additionality is a term specifically associated with offsets and project level accounting – separate from corporate GHG accounting. [GHGP PA p 16]

As defined in the GHGP Project Standard, it is a criterion stipulation that project-based GHG reductions should only be quantified if the project activity 'would not have happened anyway' – i.e. the project activity (or the same technologies or practices it employs) would not have been implemented in its baseline scenario and/or that project activity emissions are lower than baseline emissions. [GHGP PA p 130]

The GHGP Project Standard acknowledges that there is no common agreement about how to prove that a project activity and its baseline scenario are different. [GHGP PA p 16]

The GHGP Project Standard does not explicitly require a demonstration of additionality. Rather, additionality is an implicit part of the baseline emissions estimation procedures – via either the project-specific or performance standard. See Question 10.2.60. [GHGP PA pp 8]

Example 10.2.20
Demonstrating additionality

Project undertakes a landfill gas project with the intention of developing offset credits that can be sold to third parties.

Project determines that the baseline scenario involves the continuation of current activities – e.g. in the absence of this project, methane from the landfill would continue to be released to the atmosphere. Therefore, baseline emissions are equal to the GHG emissions sequestered by the methane capture technology.

To further demonstrate additionality, Project verifies the following:

- there are no laws or regulations that require the capture of landfill methane; and
- there are no laws against the capture of landfill methane.

Project claims that "1,500 tCO_2e have been avoided at a global level."

Project supports the credibility of this claim by demonstrating the undertaking of an 'intervention' to capture the methane from the landfill – and that without this intervention, the methane capture would not have happened.

Question 10.2.80
What are GHG trading programs?

Interpretive response: GHG trading programs determine compliance by comparing emissions with an emissions reduction target or cap. They may be implemented on a mandatory or voluntary basis. Such programs often have specific accounting and reporting requirements. As a result, it is necessary to check relevant programs for additional requirements when developing an inventory. [GHGP p 13]

GHG trading programs use GHG registries, where entities report GHG emissions in a public database. These registries allocate a serial number to all traded offsets or credits, and the serial numbers are retired once they are used. This prevents double counting of offset credits. [GHGP p 82]

The following are examples of GHG programs:

- **European Union Emissions Trading System** uses a compulsory carbon market to reduce emissions in high-intensity carbon-emitting industries.
- **The Climate Registry** operates the voluntary Carbon Footprint Registry for entities in North America.

Reporting landscape
Emissions Trading Schemes

As shown in the following table, only ESRS require disclosure related to Emissions Trading Schemes.

ISSB	ESRS
No requirement.	An entity discloses the percentage of scope 1 emissions from regulated emissions trading schemes. [ESRS E1.48(b)]

10.3 Offset credits

Question 10.3.10
What is an offset credit?

Interpretive response: A GHG offset is an outcome from an action, which can be associated with a transferrable instrument that represents the avoided or removed GHG emissions – a GHG credit. A GHG credit is a transferrable instrument certified by a GHG program and may be used to meet an externally imposed target. Question 10.2.80 further discusses GHG programs. [GHGP p 98]

One offset credit represents 1 tonne of CO_2e. [GHGP MGS p 148]

Excerpt from GHGP Corporate Standard [p 60]

Project based reductions and offsets/credits

[Credits] are typically generated from an activity such as an emissions reduction project and then used to meet a target in an otherwise closed system, such as a group of facilities with an absolute emissions cap placed across them. Although a credit is usually based on the underlying reduction calculation, the conversion of an offset into a credit is usually subject to strict rules, which may differ from program to program.

In the remainder of this chapter, we refer to offset credits.

Question 10.3.20

How are offset credits used to meet GHG emission reduction targets?

Interpretive response: A GHG emissions target may be met entirely from internal reductions at sources included in the inventory boundary. For remaining emissions that cannot be eliminated, offset credits may be used. [GHGP p 81]

Offset credits represent emissions reductions generated from sources external to the inventory boundary. They must be reported separately from an entity's gross emissions. The example in Appendix B illustrates the presentation of offset credits.

The purchaser of an offset credit can 'retire' it to claim the underlying reduction toward its own GHG emissions goals. [GHGP p 82]

Question 10.3.25

What is the process by which offset credits are derived from a GHG project?

Interpretive response: The following series of steps identifies the typical process from GHG project inception through offset credits being retired under a high-quality program. The highlighted steps are explored further in this question as background in understanding the discussion about the quality of carbon offsets later in this section.

Step	Description	Party performing
1	Create project description	Project Proponent
2	Review project description	Registry / Program
3	Review project description	Validation & Verification Body
4	Validate final project description	Validation & Verification Body
5	Submit final project description	Project Proponent
6	Register project	Registry / Program
7	Implement project	Project Proponent
8	Verify performance of project	Validation & Verification Body
9	Issue credits	Registry
10	Receive credits to sell / hold	Project Proponent
11	Buy credits	Buyer
12	Retire credits (to offset emissions)	Buyer
13	Record retirement of credits	Registry / Program

Most discussion about the presentation of offset credits in GHG emissions reporting focuses on the purchase and retirement of offset credits (Steps 11 to 13). In theory, Steps 12 and 13 happen simultaneously.

However, the concepts of validation (Step 4) versus verification (Step 8) and the timing of credits being issued (Step 9) are particularly relevant in understanding the factors contributing to the quality of offset credits (see Question 10.3.35). The following descriptions are included in the GHGP Mitigation Goal Standard. [GHGP MGS p 123]

- **Validation** provides assurance of goal design, base year emissions or emissions intensity, baseline scenario emissions and allowable emissions, among other accounting steps.
- **Verification** provides assurance of progress assessments undertaken during the goal period and assessments of goal achievement undertaken at the end of the goal period.

While validation is concerned with the design and set-up of the project, it is verification that drives the issuance of credits (Step 9). Verification is carried out periodically (e.g. every three to five years) and its purpose is to provide a level of assurance over whether the registered project (Step 6) is achieving its stated outcomes.

Without verification, a buyer (Steps 11 and 12) has no assurance that the GHG emissions reductions (or removals) underpinning the credits did, in fact, occur. Therefore, verification is an indicator of quality and important in assessing whether reductions for which credits have already been issued were realized or reversed (see Question 10.3.35).

Question 10.3.27

What if GHG emissions reductions are reversed after offset credits are issued?

Background: As explained in Question 10.3.25, the verification of credits under a high-quality program is an ongoing process and may identify the reversal of GHG emissions reductions or removals – e.g. the carbon sequestration associated with a reforestation project is partially reversed due to a forest fire.

Reversals from individual projects have implications for credits that have already been issued (Step 9 in the process outlined in Question 10.3.25) and may have already been retired (Steps 12 and 13).

Interpretive response: A common mechanism to help ensure that offset credits are not claimed in excess of actual emissions reductions is for a program to use 'buffer reserves' (also known as a 'buffer pool'). A buffer reserve might be kept at the project level or might be maintained across different projects to help mitigate risk.

Using a buffer reserve, a GHG program does not issue credits (Step 9) for the entire amount of emissions reductions. Instead, a percentage is kept in reserve

as a kind of insurance against the risk of reversal. Example 10.3.5 illustrates one way in which a buffer reserve might operate.

Example 10.3.5
Offset credits buffer reserve

Project is validated at the start of Year 1 and is expected to capture 20,000 tCO_2e over a 10-year crediting period – i.e. generating 2,000 offset credits a year. To counter the risk of captured emissions being released into the atmosphere, Project maintains a 20% buffer reserve – i.e. 4,000 offset credits over 10 years.

In each of Years 1 to 3, Project sells 1,600 offset credits (2,000 – 400 buffer reserve).

At the end of Year 3, verification is carried out, which reveals that the estimates used in validation were overstated and Project is now expected to capture 19,000 tCO_2e over the 10-year crediting period.

To account for the overstatement, Project retires 1,000 credits from the buffer reserve at the start of Year 4. Project plans to continue selling 1,600 credits a year, with the planned reserve now at 3,000 credits.

Note: As an alternative, Project may be required to reserve a greater percentage of credits for the buffer reserve prospectively.

Question 10.3.30
What are the considerations around the credibility of offset credits?

Interpretive response: The GHG Project Standard provides guidance to address key project accounting challenges associated with the credibility of offset credits – e.g. baseline, additionality, secondary effects, double counting. See section 10.2.

Double counting can occur when a GHG offset is counted toward the target by both the selling and purchasing entities. This can be avoided by clarifying ownership of reductions either through registries or contracts.

To assess the credibility of offset credits used to meet a target, useful information includes the project type, its geographic and organizational origin, how offsets are quantified and whether they are recognized by external programs. [GHGP p 82]

Such external programs use standards, methodologies, independent auditing and registries to assess GHG emissions reductions or removals against a set of defined criteria (see Question 10.3.35). These programs also track the

retirement of offset credits – e.g. when the offset credit holder claims the associated GHG reductions toward a GHG reduction goal.

Question 10.3.50 discusses presentation and disclosure considerations for reporting offset credits.

Example 10.3.10
Double counting offset credits

Project undertakes an internal reduction project. Project sells this project reduction to Hotel in the form of an offset credit.

Scenario 1: Inappropriate double counting

Without any contract or registry, Project and Hotel both count these reductions toward their targets. This results in the inappropriate double counting of the offset credit.

All measures in tCO_2e	Project	Hotel
Scope 1 emissions	60,000	15,000
Internal reductions	-15,000	0
Offset credit	0	-15,000
Net scope 1 reported emissions	45,000	0

Scenario 2: Appropriately avoid double counting

With a contract in place clarifying that Hotel takes sole ownership of the offset credit, only Hotel counts this reduction toward its target. Project does not count the reduction toward its target. This scenario appropriately avoids double counting of the offset credit.

All measures in tCO_2e	Project	Hotel
Scope 1 emissions	60,000	15,000
Internal reductions	0	0
Offset credit	0	-15,000
Net scope 1 reported emissions	60,000	0

Neither entity counts the reductions in calculating gross emissions. The reductions are reported separately from gross emissions. See Question 10.3.50.

Question 10.3.35

What considerations are relevant in assessing the quality of offset credits in the voluntary market?

Background: The GHGP Corporate Standard and Project Standard do not provide a specific set of criteria for assessing the quality of offset credits. However, the GHGP Mitigation Goal Standard does include guidance that may assist an entity in evaluating the quality – which can infer the value – of an offset credit before purchasing it.

Excerpt from GHGP Mitigation Goal Standard

[pp 47-48]

Offset credits applied toward goal achievement shall be:

- **Real**: Emission reductions or removals represent actual emission reductions and are not artifacts of inaccurate or incomplete accounting.
- **Additional**: Emission reductions or removals are beyond what would have happened in the absence of the incentive provided by the offset credit program or project.
- **Permanent**: Emission reductions or removals are irreversible or, if sourced from projects such to potential reversal (for example, carbon sequestration), have guarantees to ensure that any losses are compensated for, which may include replacement mechanisms such as legal guarantees, insurance, or buffer pools.
- **Transparent**: Offset credits are publicly and transparently registered with unique serial numbers to clearly document offset credit generation, transfer, retirement, cancellation, and ownership. Crediting programs are transparent regarding rules and procedures for monitoring, reporting, and verification, quantifying GHG reductions, and enforcement.
- **Verified**: Offset credits are issued from emission reductions or removals that result from projects whose performance has been appropriately validated and verified to a standard that ensures reproducible results by an independent third party that is subject to a viable and trustworthy accreditation system.
- **Owned unambiguously**: Ownership of GHG reductions or removals is clear by contractual assignment and/or government recognition of ownership rights. Transfer of ownership of offset credits must be unambiguous and documented. Once the reductions or removals are sold, the seller and host government must cede all rights to claim future credits for the same reduction in order to avoid double counting.
- **Addresses leakage**: Emission reductions or removals are generated in a manner that addresses leakage. The market (or other) mechanism that generates the transferable emissions units is designed and operated in a

way that minimizes the risk of leakage and accounts for any unavoidable leakage.

Interpretive response: Like compliance GHG trading programs (see Question 10.2.80), GHG programs in the voluntary carbon market may use registries, with unique serial numbers assigned to credits and specific methodologies and frameworks to evaluate and implement projects. The methodologies and frameworks are developed, approved and enforced by the registries.

For entities seeking to purchase offset credits, obtaining sufficient information about the projects and credits available, and comparing the options, may be a challenge. Question 10.3.30 describes high-level considerations related to the credibility of offset credits.

This question describes the risks associated with offset credits – using the quality criteria in the GHGP Mitigation Goal Standard as an example (see excerpt) – that are helpful in assessing the quality of credits. In addition, it provides examples of related disclosures that might be required, using the California Voluntary Carbon Market Disclosures Act (AB-1305) as an example; for more information about AB-1305, read our Hot Topic, Effective dates near for California climate laws.

Real

This criterion is looking for emissions reductions or removals that physically impact the metric tonnes of GHGs in the atmosphere (see Question 10.2.20). However, there are several types of available credits.

- **Ex-post credits** relate to past reductions or removals – i.e. the reductions or removals have already occurred.
- **Ex-ante credits** are issued in advance of the emissions reductions or removals being verified.

It may not always be clear whether an offset credit is an ex-post or ex-ante credit, or whether an ex-ante credit will be exchanged or adjusted once the reductions or removals have occurred. These differences create risk for an entity seeking to purchase high-quality offset credits. See Question 10.3.37 for further discussion.

Relevant to this criterion, the following disclosures are required by California AB-1305 (for example):

- emissions reduced or carbon removed on an annual basis; and
- the type of project, including whether the offsets from the project are derived from a carbon removal, an avoided emission, or a combination of both.

Additional

As described in Question 10.2.70, additionality is a fundamental characteristic of a quality offset credit. The following are example quality considerations that an entity should be aware of.

- Independent registries establish their own additionality thresholds, which may also vary by project type even within the same registry.
- Changing legal requirements may render a project non-additional (because the underlying project would have happened anyway; see Question 10.2.70) or reduce the number of offset credits that may be generated as laws set higher bars for minimum levels of performance, e.g. energy efficiency, permitted emissions output, production efficiency, or industry methods.
- Technological advances and increased adoption of those technologies may make the project the most economical choice or become 'common practice' – i.e. the underlying project would have happened anyway.

Relevant to this criterion, the following disclosure is required by California AB-1305 (for example):

- The pertinent data and calculation methods needed to independently reproduce and verify the number of emissions reductions or removal credits issued using the protocol.

Permanent

Permanence can be described in two different ways in the context of a project:

- the actual length of time that the reversal or reduction will be in place; and
- the length of time the GHG program will provide for compensation for potential reversals.

Addressing permanence within the program can be through buffer reserves (see Question 10.3.27) or other insurance types. As with other information that may indicate quality, permanence safeguards may be provided for throughout a crediting period but may not be transparent to the buyer.

Relevant to this criterion, the following disclosures are required by California AB-1305 (for example):

- Details regarding accountability measures if a project is not completed or does not meet the projected emissions reductions or removal benefits, including, but not limited to, details regarding what actions the entity, either directly or by contractual obligation, shall take under both of the following circumstances:
  - carbon storage projects are reversed; and
  - if future emissions reductions do not materialize.

Transparent

Transparency has two components:

- the first relates to the project documentation, methodologies and processes followed for managing the offset crediting and quality; and
- the second relates to visibility into ownership transfers over the life of the credit (see Owned unambiguously).

Project-related transparency involves the documentation, methodologies and processes used for managing offset crediting and quality, including monitoring plans to assess performance and provide performance reports, which may be verified.

Relevant to this criterion, the following disclosures are required by California AB-1305 (for example):

- the specific protocol used to estimate emissions reductions or removal benefits; and
- the location of the offset project site, the project timeline and the date when the project started or will start.

Verified

Each methodology sets the verification frequency and standards to be used. Registries may allow verifications of credits issued under their GHG programs to be performed only by verifiers approved by the registry – i.e. a verifier that understands the registry's methodology and will maintain its standards.

Verification can be costly and may not be required by the methodology every year. For example, a GHG program that issues ex-ante credits might not verify them to generate ex-post credits.

Relevant to this criterion, the following disclosures are required by California AB-1305 (for example):

- whether there is independent expert or third-party validation or verification of the project attributes.

Owned unambiguously

As ownership changes hands more times in an unregulated market and the buyer may be further removed from the seller that generated the credit, there may be a risk that ownership records are not keeping up with each transaction.

Ownership-related transparency concerns the visibility of ownership transfers over the life of the credit (from generation to retirement). Unique identifiers, such as serialization, facilitate tracking and verifying credit ownership throughout a credit's lifecycle. A public registry with effective governance and enforcement mechanisms, along with serialization, supports the overall credibility of the voluntary carbon market by lending transparency to the process.

The GHGP Mitigation Goal Standard describes a public registration of offset credits with unique serial numbers to aid in meeting transparency expectations. [GHGP MGS pp 47-48]

Addresses leakage

Leakage comprises the 'secondary effects' described in Question 10.2.30 and a high-quality project or program will include mitigation actions to reduce the amount of leakage to the extent possible and account for unavoidable leakage. [GHGP MGS pp 34]

Question 10.3.37

How does an ex-ante offset credit differ from an ex-post offset credit?

Interpretive response: A GHG credit, as defined in Question 10.3.10, refers to a transferable instrument certified by a GHG program. However, the methodologies that support the generation of the offset credit may contain fundamental differences that give rise to differences in the contractual terms of purchase. [GHGP p 98]

Levels of risk

The Carbon Offset Guide describes three methods of offset credit delivery with increasing levels of risk.

- **Low risk.** Ex-post credits are offset credits for removals/reductions that have already occurred and are promptly delivered to the buyer.
- **Medium risk.** Forward contracts that involve a binding agreement specifying a pre-defined price, time or fixed delivery quantity for future offsets. These contracts protect buyers by requiring sellers to produce offset credits from another project if fewer than expected are generated.
- **High risk.** Forward crediting, or ex-ante credits, involve the sale of offset credits for a future reduction or removal. Contracts may include ex-post adjustments of purchase prices that correspond to shortfalls in offset generation to protect buyers.

The forward contract and forward crediting methods may seem similar, but the risks involved differ significantly. Forward crediting exposes buyers to higher risks, and despite ex-post adjustments being part of a contract, shortfalls in generation may not be communicated to the buyer.

Offset credits that have already resulted in emissions reductions or removals and were verified are less risky relative to the other types.

Retiring offset credits

Ex-post offset credits are retired when a buyer uses them to offset emissions within a reporting period (Step 12 in Question 10.3.25). Emissions may occur during the current reporting period, but the retired credit relates to a past reduction/removal. This type of offset credit could be presented as such in a GHG inventory that is in accordance with the GHGP (see Question 10.3.50).

Ex-ante offset credits can be exchanged for ex-post credits. Contracts may also allow for ex-post adjustments to compensate for shortfalls. Two types of ex-ante offset credits have emerged:

- Type A: Credits exchanged for ex-post credits after verification of the reduction/removal; and
- Type B: Credits delivered to registries and retired to offset actual emissions despite not having yet occurred.

Type A credits have the same character upon retirement as an offset credit that was only ever issued after the emissions reduction or removal occurred.

However, Type B credits are retired before an associated reduction or removal occurs. This substantially increases the risk that subsequent information, including verification, demonstrates the project did not generate sufficient removal or reduction benefits to support the offset credits' issuance or retirement.

Reporting landscape
Offset credibility

As shown in the following table, the disclosures are broadly similar but not the same.

ISSB	ESRS
An entity discloses the extent, credibility and integrity of carbon credits intended to be used. This includes which third-party scheme(s) will verify or certify the carbon credits. [IFRS S2.36(e)(i)-(ii), 36(e)(iv)]	An entity discloses the total amount of carbon credits that are verified against recognized quality standards and canceled in the reporting period. An entity also discloses the total amount of carbon credits that are planned to be canceled in the future and whether they are based on existing contractual arrangements. [ESRS E1.59(a)-(b)] An entity explains the credibility and integrity of carbon credits used if it is making public claims of neutrality that involve the use of carbon credits. [ESRS E1.61(c)] An entity also discloses: • the extent of use and which quality criteria it uses; and [ESRS E1.AR61] certain disaggregated information as applicable – e.g. the percentage of carbon credits for each recognized quality standard. [ESRS E1.AR62(c)]

Question 10.3.40
Are offset credits different from RECs?

Interpretive response: Yes. Offset credits and RECs are fundamentally different instruments used for different purposes. They are not interchangeable.

Both offset credits and RECs may be used as tools to reduce reported emissions. But they do this differently.

- **Offset credits** convey avoided GHG emissions (tCO_2e) compared to a baseline scenario.
- **RECs** convey information about direct energy generation emissions occurring at the point of production – e.g. the scope 2 market-based emission factor associated with each MWh of energy generation.

The following table summarizes these differences.

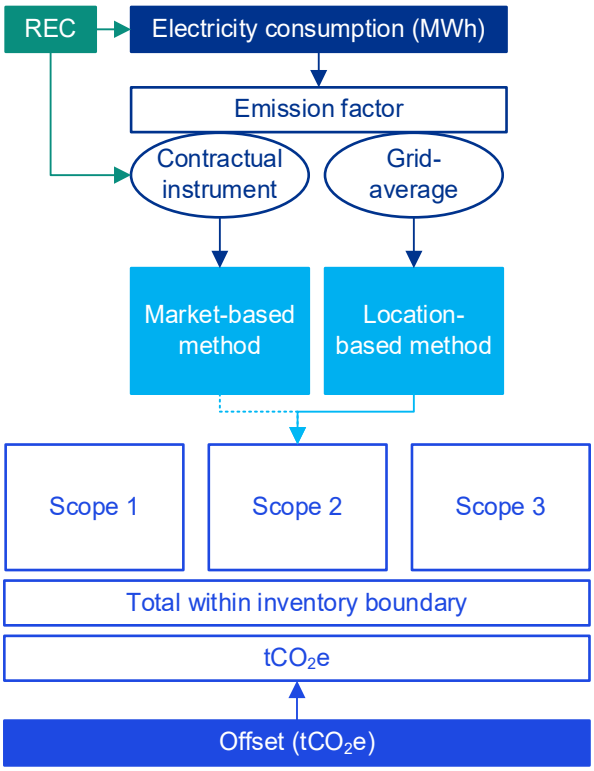
	Offset credits	RECs
Unit	1 tCO_2e	1 MWh electricity generation
Source	Projects that avoid or reduce GHG emissions to the atmosphere	Renewable electricity generators – e.g. wind, solar, biogas, hydropower, geothermal
Scope under the GHGP	Net adjustment to scope 1, 2 or 3	Lower scope 2 market-based emissions
Additionality	Required	Not required

A REC is associated with 1 MWh of electricity generation. The emission factor derived from the REC is used to calculate scope 2 market-based emissions. Because renewable energy has an associated emission factor of zero, the use of emission factors derived from RECs results in a decrease in scope 2 market-based emissions.

An offset credit is associated with 1 tCO_2e. An entity may elect to purchase a total amount of offsets equal to the total tCO_2e from its entire corporate inventory – e.g. the sum of all scope 1, 2 and 3 emissions identified within the inventory boundary. In this case, the entity's reported emissions are neutralized by purchasing offsets equal to the sum of the entity's emissions.

RECs are not offsetting emissions. Rather, the purchase of RECs represents renewable electricity from a low (or zero) emissions source. This reduces the reported emissions associated with an entity's electricity use.

The following diagram illustrates the differences between offset credits and RECs.



Example 10.3.20
Purchasing RECs to reduce scope 2 market-based emissions

Hotel and its competitor consume the same amount of electricity on the same grid. Hotel purchases RECs and its competitor does not.

Hotel uses the emission factor of zero conveyed by the REC to calculate scope 2 market-based emissions. Because its competitor has not entered into any contractual arrangements, it uses the residual mix emission factor to calculate scope 2 market-based emissions. To calculate scope 2 location-based emissions, both entities use the grid-average emission factor.

	Hotel	Competitor
Electricity consumption (MWh)	500	500
RECs purchased (MWh)	500	0
Scope 2 market-based emissions calculation:		
Emission factor (tCO_2e/MWh)[1]	0	0.3
Emissions (tCO_2e)[2]	**0**	**150**

	Hotel	Competitor
Scope 2 location-based emissions calculation:		
Emission factor (tCO_2e/MWh)[1]	0.2	0.2
Emissions (tCO_2e)[2]	**100**	**100**

Notes:

1. Hypothetical emission factors are used for simplicity. This example does not demonstrate the unit conversion calculation (e.g. converting pounds to tonnes; see Question 5.2.20) or the GWP conversion calculation (e.g. converting CH_4 to CO_2e; see Question 2.3.50).
2. Emissions are calculated as Electricity consumption × Emission factor

Example 10.3.30

Purchasing offset credits to meet GHG emission reduction goals

Hotel has set GHG emissions targets, but its competitor has not.

Hotel's targets relate to all emissions within its inventory boundary, specifically scope 1, scope 2 location-based and scope 3. It has undertaken various initiatives to reduce the emissions within its inventory boundary as much as possible. For the residual emissions, Hotel has purchased offset credits.

All measures in tCO_2e	Hotel	Competitor
Scope 1 emissions	100	50
Scope 2 location-based emissions	250	250
Scope 3 emissions	800	600
Total emissions calculated within the inventory boundary	**1,150**	**900**
Offset credits purchased	-1,150	0
Net emissions	0	900

Question 10.3.50

How are offset credits reported?

Interpretive response: An entity reports physical inventory emissions for its chosen inventory boundaries separately and independently of any GHG trades (purchase or sale of allowances, offsets and credits) they undertake. [GHGP p 60]

Internal projects reduce GHGs within an entity's inventory boundary. These reductions are not reported separately unless they are sold, traded externally or otherwise used as an offset credit. [GHGP p 61]

When disclosing targets, entities specify whether offsets are used and, if so, how much of the target reduction was achieved using offsets. [GHGP p 82]

The example in Appendix B illustrates how offsets might be presented.

Future developments#

2024 has been a big year for advancing voluntary carbon markets.

In May, the US government published the Principles for Responsible Participation in the Voluntary Carbon Markets (VCMs) to advance the integrity of these markets. The principles were issued by the US Treasury, the Department Secretaries of Agriculture and Energy, the Senior Advisor to the President for International Climate Policy, and both the National Economic and National Climate Advisors to the President. The policy is intended to increase private capital available to fund carbon reduction, removal, and avoidance projects. Read more in KPMG Hot Topic, US supports efforts to improve voluntary carbon markets.

November also saw the final report from IOSCO on voluntary carbon markets that outlines a comprehensive set of 21 'good practices' to promote integrity, and facilitate order and transparency in voluntary carbon markets. IOSCO's report is intended for regulators and other authorities and market participants, and it seeks to offer support for jurisdictions that have established or may be seeking to establish voluntary carbon markets. Upon publication of the final report, IOSCO and the World Bank announced a partnership that is expected to assist jurisdictions looking to establish markets for carbon credit trading following the Good Practices. [IOSCO report]

As COP29 came to a close in November, the Paris Agreement Crediting Mechanism (PACM), also known as Article 6.4 of the Paris Agreement, was fully adopted. Decisions to fully operationalize are still to be made, such as which methodologies may be used to support high-quality projects. [COP29 release]

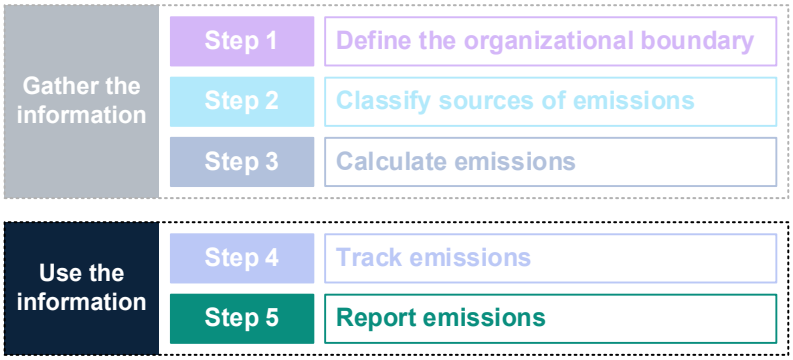
11. Reporting

Detailed contents

New item added in this edition **

11.1 How the GHGP works

The last step in the process is to report the information gathered and tracked.



The presentation and disclosure requirements of the GHGP differ depending on whether an entity elects to follow just the Corporate Standard (including the Scope 2 Amendment) or is also following the Scope 3 Standard.

In many cases, entities will follow the standards and guidance of the GHG in gathering information (Steps 1 to 3) and tracking emissions (Step 4), but will present emissions in accordance with other standards – e.g. under the future requirements of ESRS E1, IFRS S2 or the SEC's climate rule once finalized. In such cases, the discussion in this chapter does not apply.

Reporting landscape
Disclosures

IFRS Sustainability Disclosure Standards (IFRS S2) and ESRS (E1) each have their own disclosures and do not rely on disclosures made in accordance with the GHGP.

11.2 Which standards and guidance apply

Question 11.2.10
How is GHG information presented?

Interpretive response: Similar to financial statements, the basis of presentation needs to be clearly stated in the GHG emissions statement.

Under the general guidelines, a public GHG report: [GHGP p 62]

- is based on the best data available at the time of publication;
- is transparent about limitations;
- communicates any material discrepancies; and
- presents gross emissions separate from any GHG trades – e.g. offsets.

The GHGP requires reporting a minimum of scopes 1 and 2 emissions. As a result, for an emissions statement presented in accordance with the GHGP, there are two commonly used bases of presentation that are acceptable. [GHGP S3 p 6]

	Report in accordance with…	The emissions statement includes…
Approach A	the Corporate Standard and the Scope 2 Amendment	• Scope 1 and Scope 2 emissions; and • Scope 3 emissions to the extent the entity chooses – e.g. Category 6 (business travel).
Approach B	all components of the GHGP	• Scope 1 and Scope 2 emissions; and • Scope 3 emissions; unlike Approach A, all categories of emissions are disclosed, with any exclusions justified. [GHGP S3 p 60]

Approach A is illustrated in Appendix B; Approach B is illustrated in Example 11.2.10.

Example 11.2.10
Basis of presentation

Hotel has prepared its GHG emissions schedules and related notes in accordance with the GHGP, following Approach B (see Question 11.2.10). The following is an example basis of presentation.

Hotel has prepared its GHG emissions schedules and related notes for the year ended December 31, Year 5, in accordance with the World Resources Institute and World Business Council for Sustainable Development's Greenhouse Gas Protocol standards and guidance (collectively, the GHG Protocol).

- Scope 1 emissions have been prepared in accordance with *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (revised edition)
- Scope 2 emissions have been prepared in accordance with The Greenhouse Gas Protocol: GHG Protocol Scope 2 Guidance: An amendment to the GHG Protocol Corporate Standard
- Scope 3 emissions have been prepared in accordance with The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

Question 11.2.20

Can an entity report in accordance with the Corporate Standard without following the Scope 2 Amendment?

Interpretive response: No. Reporting in accordance with the Corporate Standard includes reporting in accordance with the Scope 2 Guidance. The Scope 2 Guidance is an amendment to the Corporate Standard and not a standalone document.

Excerpt from GHGP Scope 2 Guidance [pp 7, 10]

Purpose of this Guidance

This guidance acts as an amendment to the Corporate Standard, providing updated requirements and best practices on scope 2 accounting and reporting.

Changes from the Corporate Standard

This guidance introduces accounting and reporting requirements related to scope 2 that replace and add to those in the *Corporate Standard.*

Question 11.2.30

If scope 3 categories are included when reporting under the Corporate Standard, is the measurement and disclosure guidance of the Scope 3 Standard followed?

Interpretive response: The Corporate Standard does not require that scope 3 emissions be presented. The reporting of discrete scope 3 categories is at the discretion of the entity (see chapter 8).

Because the Scope 3 Standard was developed sometime after the Corporate Standard (see Question 2.3.20), the latter does not contemplate calculation or disclosure guidance for scope 3 categories.

However, we recommend the following approach, which provides disclosures related to scope 3 categories at least commensurate with the detail presented for scopes 1 and 2.

- The scope 3 calculation guidance is followed (see chapter 8).
- The presented scope 3 categories are disaggregated by category, instead of being presented as a single line of 'scope 3 emissions'.
- The following additional information is disclosed:
  - a list of scope 3 categories and activities included in the inventory; and
  - for each scope 3 category, a description of the methodologies, allocation methods and assumptions used to calculate scope 3 emissions.

In addition, in assessing whether sufficient information is disclosed, an entity considers the underlying principles of the GHGP – relevance, completeness, consistency, transparency and accuracy (see Question 2.3.30).

Question 11.2.40**

If only certain scope 3 categories are presented, can the basis of preparation be the Scope 3 Standard?

Interpretive response: Generally, no. When fewer than all relevant categories are measured and presented, the basis of preparation generally follows Approach A as outlined in Question 11.2.10.

Scope 3 categories may be excluded to the extent they are not relevant or significant to the GHG inventory. In that case, an entity discloses the justification for the exclusion. However, omitting a *significant* scope 3 category precludes a basis of presentation that is in accordance with the Scope 3 Standard, regardless of the underlying rationale. [GHGP S3 p 60]

11.3 Presentation and disclosure

Question 11.3.10

What are the required disclosures?

Interpretive response: As a general principle, reported information needs to be relevant, complete, consistent, transparent and accurate (see Question 2.3.30).

The GHGP distinguishes between the following levels of disclosure.

Shall: These disclosures are required and can be omitted only if immaterial.

Should: These disclosures are recommended but not required and may be omitted.

May: These disclosures are optional and may be included at the discretion of the entity.

There are also conditional disclosures, meaning that they are recommended only if certain optional disclosures are made, but are not required and may be omitted.

See Appendix A for the GHGP disclosures.

In addition, the following are typically disclosed even though they are not stated explicitly in the GHGP:

- the reporting entity;
- the reporting period covered; and
- the basis of presentation (see Question 11.2.10).

Question 11.3.20
Is comparative information required?

Interpretive response: No. The GHGP does not require disclosure of year-over-year comparative information. [GHGP chp 9]

However, it does require disclosure of, for example, the "year chosen as the base year, and an emissions profile over time that is consistent with and clarifies the chosen policy for making base year emissions recalculations." See section 9.2. [GHGP p 63]

Question 11.3.30
How are the main GHGs presented?

Interpretive response: The Corporate Standard lists information that is required to be included in reporting (see Appendix A). Such requirements include: [GHGP chp 9]

- total scopes 1 and 2 emissions independent of any GHG trades such as sales, purchases, transfers or banking of allowances;
- emissions data separately for each scope; and
- emissions data for all seven GHGs separately in metric tonnes and in tonnes of CO_2e, separately for scope 1 and scope 2.

The following is an example of how disclosure of the main GHGs may appear if material to the entity and all seven GHGs are relevant.

GHG	Scope 1		Scope 2	
	Metric Tonnes	Tonnes of CO_2e	Metric Tonnes	Tonnes of CO_2e
CO_2				
CH_4				
N_2O				
HFCs				
PFCs				
SF_6				
NF_3				

The disclosure of GHG emissions by individual GHGs is also optional in the Scope 3 Standard. The example in Appendix B illustrates how emissions per gas might be disclosed.

In our experience, it may not be possible for an entity to obtain the appropriate level of data to disclose GHG emissions by individual gas (for scope 1, 2 or 3). For example, in Japan, available emission factors for purchased electricity reflect CO_2 but do not reflect CH_4 and N_2O.

If individual GHGs are not relevant, in our experience it is common for entities either to explain that the GHGs were not released from the inventory boundary, or to show (within a table) zero emissions for any GHGs that are not applicable. An entity may further explain that zero emissions are either not occurring, not estimated (e.g. poor data quality, too costly to obtain data) or included in another category.

GHG emissions not covered by the Kyoto Protocol (e.g. CFCs, NOx) are not included in the scopes but may be reported separately at the entity's discretion.

Question 11.3.40
What are biogenic emissions?

Interpretive response: GHG inventories account for emissions from both biogenic (e.g. wood) and non-biogenic (e.g. fossil fuels such as oil, gas and coal) sources.

Biogenic emissions are CO_2 emissions from the combustion or biodegradation of biomass. Biomass is any material or fuel produced by biological processes of living organisms – e.g. plant material, landfill gas. [GHGP S2 p 100]

Although biomass can produce fewer GHG emissions than fossil fuels, it still produces GHG emissions. Biogenic materials are increasingly used as a resource for energy generation. For example, a biomass heating system may use wood chips and pellets to heat a building. [GHGP S2 p 57]

Direct CO_2 emissions from the combustion of biomass are reported separately from the scopes (see Appendix A). [GHGP S2 p 57]

This is because burning biomass emits carbon that is part of the biogenic carbon cycle (e.g. releases carbon that was absorbed by plants and will be absorbed by them again) while burning fossil fuels releases carbon that has been in the ground for millions of years (e.g. releases in a short amount of time a significant amount of carbon which took millennia to form).

The burning of biomass also produces CH_4 and N_2O. Only CO_2 is reported separately, whereas CH_4 and N_2O are included in the emissions inventory in the usual way. [GHGP S2 p 57]

This is because CO_2 is part of the biogenic carbon cycle, while CH_4 and N_2O are not.

Example 11.3.10**
Presenting biogenic emissions

Hotel prepares its GHG inventory for scope 1 direct emissions and presents them by fuel source: natural gas and biomass (e.g. wood pellets). As a direct source under the company's control, biomass combustion emissions are a direct source of emissions so the CH_4 and N_2O emissions are included in scope 1.

Hotel presents all CO_2 emissions from this direct source separately as biogenic emissions. Scope 1 presentation includes all gases (CO_2, CH_4 and N_2O) except for biogenic emissions sources, which requires separate presentation of the CO_2 component of this fuel source as shown in the table.

All measures in tCO_2e	Totals[2]	Natural gas	Biomass
Scope 1	214.6	212.4	2.2
Biogenic emissions	375.0	--	375.0
Emissions	**589.6**	**212.4**	**377.2**

Notes:

1. This example does not demonstrate the unit conversion calculation (e.g. converting pounds to tonnes; see Question 5.2.20) or the GWP conversion calculation (e.g. converting CH_4 to CO_2e; see Question 2.3.50).
2. Emissions are calculated as MMBtus (energy requirement) × Emission factor. Each fuel source presented produced 4,000 MMBtus.

A. Disclosures

The following excerpts are from the reporting chapters in the GHGP's standards and guidance on scopes 1, 2 and 3. Although these disclosures are the more significant requirements, they are not an exhaustive listing.

Excerpt from GHGP Corporate Standard [pp 63-64]

Required information

A public GHG emissions report that is in accordance with the GHG Protocol Corporate Standard shall include the following information:

DESCRIPTION OF THE COMPANY AND INVENTORY BOUNDARY

- An outline of the organizational boundaries chosen, including the chosen consolidation approach.
- An outline of the operational boundaries chosen, and if scope 3 is included, a list specifying which types of activities are covered.
- The reporting period covered.

INFORMATION ON EMISSIONS

- Total scope 1 and 2 emissions independent of any GHG trades such as sales, purchases, transfers, or banking of allowances.
- Emissions data separately for each scope.
- Emissions data for all six GHGs separately (CO_2, CH_4, N_2O, HFCs, PFCs, SF_{26}) in metric tonnes and in tonnes of CO_2 equivalent.
- Year chosen as base year, and an emissions profile over time that is consistent with and clarifies the chosen policy for making base year emissions recalculations.
- Appropriate context for any significant emissions changes that trigger base year emissions recalculation (acquisitions/divestitures, outsourcing/ insourcing, changes in reporting boundaries or calculation methodologies, etc.).
- Emissions data for direct CO_2 emissions from biologically sequestered carbon (e.g., CO_2 from burning biomass/biofuels), reported separately from the scopes.
- Methodologies used to calculate or measure emissions, providing a reference or link to any calculation tools used.
- Any specific exclusions of sources, facilities, and / or operations.

Optional information

A public GHG emissions report should include, when applicable, the following additional information:

INFORMATION ON EMISSIONS AND PERFORMANCE

- Emissions data from relevant scope 3 emissions activities for which reliable data can be obtained.
- Emissions data further subdivided, where this aids transparency, by business units/facilities, country, source types (stationary combustion, process, fugitive, etc.), and activity types (production of electricity, transportation, generation of purchased electricity that is sold to end users, etc.).
- Emissions attributable to own generation of electricity, heat, or steam that is sold or transferred to another organization.
- Emissions attributable to the generation of electricity, heat or steam that is purchased for re-sale to non-end users.
- A description of performance measured against internal and external benchmarks.
- Emissions from GHGs not covered by the Kyoto Protocol (e.g., CFCs, NOx,), reported separately from scopes.
- Relevant ratio performance indicators (e.g. emissions per kilowatt-hour generated, tonne of material production, or sales).
- An outline of any GHG management/reduction programs or strategies.
- Information on any contractual provisions addressing GHG-related risks and obligations.
- An outline of any external assurance provided and a copy of any verification statement, if applicable, of the reported emissions data.
- Information on the causes of emissions changes that did not trigger a base year emissions recalculation (e.g., process changes, efficiency improvements, plant closures).
- GHG emissions data for all years between the base year and the reporting year (including details of and reasons for recalculations, if appropriate)
- Information on the quality of the inventory (e.g., information on the causes and magnitude of uncertainties in emission estimates) and an outline of policies in place to improve inventory quality.
- Information on any GHG sequestration.
- A list of facilities included in the inventory.
- A contact person.

INFORMATION ON OFFSETS

- Information on offsets that have been purchased or developed outside the inventory boundary, subdivided by GHG storage/removals and emissions reduction projects. Specify if the offsets are verified/certified and/or approved by an external GHG program (e.g., the Clean Development Mechanism, Joint Implementation).
- Information on reductions at sources inside the inventory boundary that have been sold/transferred as offsets to a third party. Specify if the reduction has been verified/certified and/or approved by an external GHG program.

Excerpt from GHGP Scope 2 Guidance [pp 59-62]

7.1 Accounting and Reporting Requirements

This Guidance provides a new set of requirements applied to the *Corporate Standard* in calculating and reporting scope 2 emissions. Therefore, conformance with this Guidance is required in order to prepare an inventory in conformance with the *Corporate Standard*. In addition to all existing *Corporate Standard* accounting and reporting requirements (see Chapter 9 of the *Corporate Standard*), companies **shall** calculate and report scope 2 in the following ways:

Required information for scope 2

For companies with operations only in markets that do not provide product or supplier-specific data or other contractual instruments…:

- Only one scope 2 result shall be reported, based on the location-based method.

For companies with any operations in markets providing product or supplier specific data in the form of contractual instruments:

- Companies **shall** account and report scope 2 emissions in two ways and label each result according to the method: one based on the location-based method, and one based on the market-based method.
- Many companies' GHG inventories will include a mix of operations globally, some where the market-based method applies and some where it does not. Companies **shall** account for and report all operations' scope 2 emissions according to both methods.
- To do so, emissions from any operations in locations that do not support a market-based method approach **shall** be calculated using the location based method (making such operations' results identical for location-based and market-based methods). Companies should note what percentage of

their overall electricity consumption reported in the market-based method reflects actual markets with contractual information.

Scope 2 Quality Criteria. Companies **shall** ensure that any contractual instruments used in the market-based method total meet the Scope 2 Quality Criteria specified in Table 7.1. If instruments do not meet the Criteria, then other data (listed in Table 6.3) **shall** be used as an alternative in the market-based method total. In this way, *all* companies required to report according to the market-based method will have some type of data option.

- Companies **may** provide a reference to an internal or external third-party assurance process, or assurance of conformance provided by a certification program, supplier label, green power program, etc. An attestation form **may** be used to describe the chain of custody of purchased certificates or other contractual instruments.
- If a residual mix is not currently available, reporters **shall** note that an adjusted emissions factor is not available or has not been estimated to account for voluntary purchases and this may result in double counting between electricity consumers.

Inventory totals. For companies adding together scope 1 and scope 2 for a final inventory total, companies may either report two corporate inventory totals (one reflecting each scope 2 method), or may report a single corporate inventory total reflecting one of the scope 2 methods.

- If reporting a single corporate inventory total, the scope 2 method used should be the same as the one used for goal setting. Companies shall disclose which method was chosen for this purpose.

Methodology disclosure. Companies **shall** disclose methods used for scope 2 accounting. For the market-based method, companies **shall** disclose the category or categories of instruments from which the emission factors were derived, where possible specifying the energy generation technologies.

Base-year information. Companies **shall** disclose the year chosen as the base year; the method used to calculate the base year's scope 2 emissions; whether historic location based data is used as a proxy for a market-based method; and the context for any significant emission changes that trigger base-year emissions recalculation (acquisitions/ divestitures, outsourcing/insourcing, changes in reporting boundaries or calculation methodologies, etc.)

Disclose basis for goal setting. If a company sets a corporate inventory reduction goal and/or a scope 2-specific reduction goal, the company **shall** clarify whether the goal is based on the location-based method total or market based method total.

7.2 Recommended disclosure

Annual electricity consumption. Companies **should** report total electricity, steam, heat, and cooling per reporting period separately from the scopes totals (in kWh, MWh, BTU, etc.), which should include all scope 2 activity data as well as the quantity of energy consumed from owned/ operated installations (which may be only reported in scope 1 and not in scope 2.)

Biogenic emissions. Companies **should** separately report the biogenic CO_2 emissions from electricity use (e.g. from biomass combustion in the electricity value chain) separately from the scopes, while any CH_4 and N_2O emissions should be reported in scope 2.

- Companies **should** document if any GHG emissions other than CO_2 (particularly CH_4 and N_2O) are not available for, or excluded from, location-based grid average emissions factors or with the market-based method information.

Other instrument retirement. Companies **should** disclose additional certificate or other instrument retirement performed in conjunction with their voluntary claim, such as with certificate multipliers or any pairing required by regulatory policy.

Basis for upstream scope 3. The reporting entity **should** identify which methodology has been used to calculate and report scope 3, category 3—upstream energy emissions not recorded in scope 1 and 2, scope 3.

Instrument features. Where relevant, companies **should** disclose key features associated with their contractual instruments claimed, including any instrument certification labels that entail their own set of eligibility criteria, as well as characteristics of the energy generation facility itself and the policy context of the instrument.

Role of corporate procurement in driving new projects. Where relevant, companies should elaborate in narrative disclosure how any of the contractual instruments claimed in the market-based method reflect a substantive contribution by the company in helping implement new low carbon projects.

7.3 Optional information

Scope 2 totals disaggregated by country. This can improve transparency on where market-based method totals differ from location-based.

Avoided emissions estimation. Companies **may** separately report an estimation of GHG emissions avoided from a project or action. This quantification should be based on project-level accounting, with methodologies and assumptions documented (including to what the reduction is being compared).

Advanced grid study estimations. Where advanced studies (or real-time information) are available, companies **may** report scope 2 estimations separately as a comparison to location-based grid average estimations, and companies can document where this data specifically informed efficiency decision making or time-of-day operations. Because these studies or analyses may be more difficult to use widely across facilities or to standardize/aggregate consistently without double counting, companies should ensure that any data used for this purpose has addressed data sourcing and boundaries consistent with the location-based method.

Scope 2 results calculated by other methods. If companies are subject to mandatory corporate reporting requirements for facilities in a particular

region/nation that specify methodologies other than the two required for dual reporting, these companies **may** report these results separately from the scopes.

Disclose purchases that did not meet Scope 2 Quality Criteria. If a reporting entity's energy purchases did not meet all Scope 2 Quality Criteria, the entity **may** note this separately. This note should detail which Criteria have been met, with details of why the remaining Criteria have not. This will provide external stakeholders with the information they require, and allow the reporting entity to disclose the efforts made to adhere to the guidance. (Location-based method data will be used as proxy emission factors in the market-based method total.)

Excerpt from GHGP Corporate Value Chain Accounting and Reporting Standard [pp 119-120]

11.1 Required information

Companies shall publicly report the following information.

- A scope 1 and scope 2 emissions report in conformance with the *GHG Protocol Corporate Standard*
- Total scope 3 emissions reported separately by scope 3 category
- For each scope 3 category, total emissions of GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) reported in metric tons of CO_2 equivalent, excluding biogenic CO_2 emissions and independent of any GHG trades, such as purchases, sales, or transfers of offsets or allowances
- A list of scope 3 categories and activities included in the inventory
- A list of scope 3 categories or activities excluded from the inventory with justification of their exclusion
- Once a base year has been established: the year chosen as the scope 3 base year; the rationale for choosing the base year; the base year emissions recalculation policy; scope 3 emissions by category in the base year, consistent with the base year emissions recalculation policy; and appropriate context for any significant emissions changes that triggered base year emissions recalculations
- For each scope 3 category, any biogenic CO_2 emissions reported separately
- For each scope 3 category, a description of the types and sources of data, including activity data, emission factors and GWP values, used to calculate emissions, and a description of the data quality of reported emissions data
- For each scope 3 category, a description of the methodologies, allocation methods, and assumptions used to calculate scope 3 emissions

- For each scope 3 category, the percentage of emissions calculated using data obtained from suppliers or other value chain partners

11.2 Optional information

A public GHG emissions report should include, when applicable, the following additional information.

- Emissions data further subdivided where this adds relevance and transparency (e.g., by business unit, facility, country, source type, activity type, etc.)
- Emissions data further disaggregated within scope 3 categories where this adds relevance and transparency (e.g., reporting by different types of purchased materials within category 1, or different types of sold products within category 11)
- Emissions from scope 3 activities not included in the list of scope 3 categories (e.g., transportation of attendees to conferences/events), reported separately (e.g., in an “other” scope 3 category)
- Emissions of GHGs reported in metric tons of each individual gas
- Emissions of any GHGs other than CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 whose 100-year GWP values have been identified by the IPCC to the extent they are emitted in the company’s value chain (e.g., CFCs, HCFCs, NF_3, NOX, etc.) and a list of any additional GHGs included in the inventory
- Historic scope 3 emissions that have previously occurred, reported separately from future scope 3 emissions expected to occur as a result of the reporting company’s activities in the reporting year (e.g., from Waste generated in operations, Use of sold products, End-of-life treatment of sold products)
- Qualitative information about emission sources not quantified
- Information on any GHG sequestration or removals, reported separately from scope 1, scope 2 and scope 3 emissions
- Information on project-based GHG reductions calculated using the project method (e.g., using the GHG Protocol for Project Accounting), reported separately from scope 1, scope 2, and scope 3 emissions
- Information on avoided emissions (e.g., from the use of sold products), reported separately from scope 1, scope 2, and scope 3 emissions
- Quantitative assessments of data quality
- Information on inventory uncertainty (e.g., information on the causes and magnitude of uncertainties in emission estimates) and an outline of policies in place to improve inventory quality

- The type of assurance performed (first or third party), the relevant competencies of the assurance provider(s), and the opinion issued by the assurance provider
- Relevant performance indicators and intensity ratios
- Information on the company's GHG management and reduction activities, including scope 3 reduction targets, supplier engagement strategies, product GHG reduction initiatives, etc.
- Information on supplier/partner engagement and performance
- Information on product performance
- A description of performance measured against internal and external benchmarks
- Information on purchases of GHG reduction instruments, such as emissions allowances and offsets, from outside the inventory boundary
- Information on reductions at sources inside the inventory boundary that have been sold/transferred as offsets to a third party
- Information on any contractual provisions addressing GHG-related risks or obligations
- Information on the causes of emissions changes that did not trigger a scope 3 base year emissions recalculation
- GHG emissions data for all years between the scope 3 base year and the reporting year (including details of and reasons for recalculations, if appropriate)
- Additional explanations to provide context to the data

B. Example GHG emissions statement

The following example demonstrates one way that a hypothetical company, ABC Company, could present a GHG emissions statement in accordance with the required disclosures of the GHGP Corporate Standard, which includes the Scope 2 Guidance. See section 11.2.

This example has been prepared for illustrative purposes only and does not illustrate all required disclosures, and does not include disclosures in the Corporate Standard that are optional or recommended. See section 11.3.

ABC COMPANY, INC. AND SUBSIDIARIES

Greenhouse Gas (GHG) emissions statement

Year ended December 31, 20X2[1]

In tonnes of carbon dioxide equivalent (CO_2e)

Scope 1 emissions		XX
Scope 2 emissions:		
Market-based method	XX	
Location-based method	XX	
Total scope 1 and scope 2 emissions (market-based method)		**XX**
Offset of removal-based carbon credits[2]		(XX)
Select scope 3 emissions:		
Category 1, purchased goods and services		XX
Category 6, business travel		XX
Category 7, employee commuting		XX
Total reported scope 3 emissions		**XX**

The accompanying notes on pages X to Y form an integral part of this GHG emissions statement.

1. Reporting entity

ABC Company, Inc. and subsidiaries (the Company) is a technology business headquartered in Atlanta, GA with operations throughout the US that develops, manufactures and sells computer software and consumer electronics, and provides related services. Consumer electronics include personal computers, tablets and gaming consoles.

2. Basis of presentation

The Company has prepared its GHG emissions statement for the year ended December 31, 20X2 in accordance with the World Resources Institute and World Business Council for Sustainable Development's Greenhouse Gas Protocol standards and guidance (collectively, the GHG Protocol):

- Scope 1 and certain categories of scope 3 emissions have been prepared in accordance with the GHG Protocol Corporate Accounting and Reporting Standard (revised edition)[3]
- Scope 2 emissions have been prepared in accordance with the GHG Protocol Scope 2 Guidance: An amendment to the GHG Protocol Corporate Standard.

3. Organizational boundary

The Company presents its emissions under the operational control approach, accounting for emissions from operations over which it, or one of its subsidiaries, has the full authority to introduce and implement its operating policies.

On November 30, 20X2, the Company acquired Sierra Corp. The Company has excluded Sierra Corp from its emissions calculations because the necessary data is not yet available. The Company plans to include Sierra Corp in next year's GHG emissions statement and will recalculate the base year (see Note 7).

4. Use of estimates and estimation uncertainties

The Company bases its estimates and methodologies on historical experience, available information and various other assumptions that it believes to be reasonable. Emissions data presented are subject to measurement uncertainties resulting from limitations inherent in the nature and the methods used for determining such data. The selection of different but acceptable measurement techniques can result in materially different measurements. The precision of different measurement techniques may also vary.

5. Operational boundaries

Emissions are calculated and presented independent of any GHG trades such as sales, purchases, transfers or banking of allowances.[4, 5]

a. Scope 1 emissions

Scope 1 emissions are direct emissions from the combustion of fuel from sources inside the organizational boundary and include the following.

Source	*Boundary description*
Stationary combustion	Manufacturing equipment, boilers, furnaces, generators.
Mobile combustion	Company-leased vehicles, company-owned vehicles.
Fugitive emissions	Leaks from air conditioning, refrigeration, manufacturing equipment.

b. Scope 2 emissions

Scope 2 emissions are indirect emissions from the generation of acquired and consumed electricity, steam, heat or chilled water occurring at sources outside of the organizational boundary as a consequence of activities from sources inside the organizational boundary, and include the following.

Source	*Boundary description*
Purchased electricity Steam and heat Cooling	Data centers, owned office spaces, leased office spaces, inventory storage facilities, manufacturing facilities, retail storefronts.

c. Scope 3 emissions

Scope 3 emissions are indirect emissions from the generation of fuel from sources outside the organizational boundary as a consequence of activities of the Company.

The Company has elected to include three categories of scope 3 emissions in its GHG emissions statement. These emissions have been calculated (but are not presented) in accordance with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard and following the GHG Protocol Technical Guidance for Calculating Scope 3 Emissions.

Source	*Boundary description*
Category 1, purchased goods and services	The production, transportation and distribution of products purchased or acquired, including hard drives, semiconductors, batteries, keyboards, third-party software.
Category 6, business travel	Air, rail, bus, automobile (including employee-owned and rental cars) and hotel stays when employees* travel for business.
Category 7, employee commuting	Air, rail, bus, automobile (including employee-owned and rental cars) when employees* commute between home and worksites.

* Employees include employees of operations owned, operated or leased by the Company. The Company does not include consultants, contractors or other individuals who travel or commute on behalf of the Company.

6. Emissions per gas[6]

Emissions data for all seven GHGs in metric tonnes and in tonnes of CO_2 equivalent include only scope 1 and 2 emissions. All amounts are for the year ended December 31, 20X2.

	in absolute mt gas						
	Carbon dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	Nitrogen trifluoride (NF_3)	Hydro-fluoro carbons (HFCs)	Perfluoro carbons (PFCs)	Sulfur Hexa fluoride (SF_6)
Scope 1	XX	XX	XX	XX	XX	XX	XX
Scope 2	XX	XX	XX	XX	XX	XX	XX
- Location-based	XX	XX	XX	XX	XX	XX	XX
- Market-based	XX	XX	XX	XX	XX	XX	XX
	in tCO_2e						
	CO_2	CH_4	N_2O	NF_3	HFCs	PFCs	SF_6
Scope 1	XX	XX	XX	XX	XX	XX	XX
Scope 2	XX	XX	XX	XX	XX	XX	XX
- Location-based	XX	XX	XX	XX	XX	XX	XX
- Market-based	XX	XX	XX	XX	XX	XX	XX

7. Base year

The Company's base year for scope 1 and scope 2 (market-based method) emissions is 20Y9. No base year has been set for scope 3 emissions.

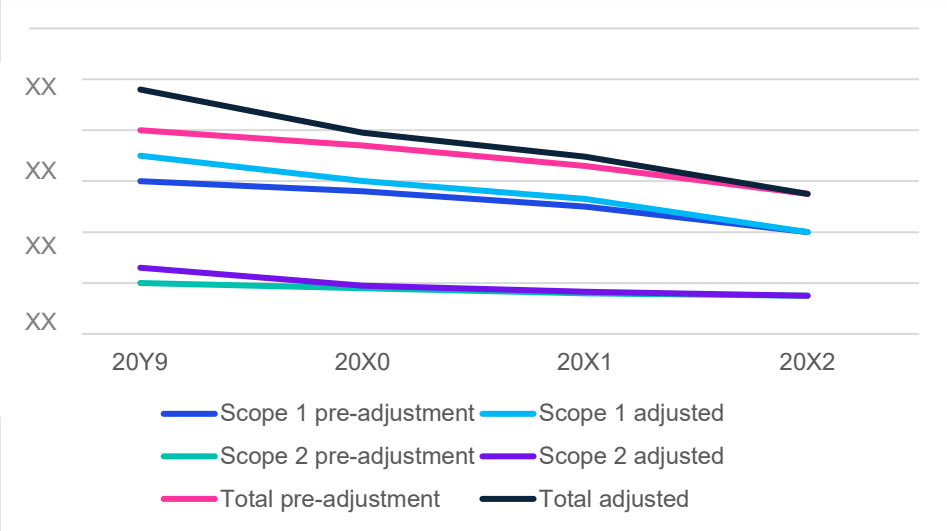
The base year is recalculated if there are changes in any of the following that are significant either individually or in aggregate:

- Structural changes in the organizational boundary, including acquisitions and divestments.
- Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact on the base year emissions data.

In 20X2, the Company recalculated its scope 1 and scope 2 base year emissions to reflect the following:

- Acquisition of Target Corp on May 5, 20X1, which is also reflected in the Company's current year emissions.
- Divestment of three business units during 20X2, which are also not reflected in the Company's current year emissions.

The following graph shows total scope 1 and scope 2 (market-based method) emissions in the base year and their development over time to the end of the current year.[7] The pre-adjustment amounts for the years 20Y9 to 20X1 were previously reported in the Company's 20X1 GHG emissions statement. The adjusted amounts in 20Y9 to 20X1 are after accounting for the above transactions that triggered a recalculation of past emissions.



8. Measurement methodologies

a. Scope 1 emissions

Source	*Method*	*Emission factors*	*Inputs*
Stationary combustion	Emission factors applied to primary data or average data where primary data is unavailable	[Year] Environmental Protection Agency (EPA) Emission Factors for GHG Inventories	• Fuel receipts • Purchase records • Metering • Fuel expenditure data and average prices
Mobile combustion	Emission factors applied to primary data or distance based where primary data is unavailable	[Year] EPA Emission Factors for GHG Inventories	• Fuel receipts • Distance travelled • Mode of transport and vehicle type • Weight of shipment
Fugitive emissions	Spend-based	[Year] Department for Environment, Food and Rural Affairs (DEFRA)	• Equipment inventory count

b. Scope 2 emissions

Source	*Method*	*Emission factors*	*Inputs*
Purchased electricity	Location-based	• EPA Emissions & Generation Resource Integrated	Utility bill/ metered consumption

Source	*Method*	*Emission factors*	*Inputs*
		• Database [Year] (eGRID) • [Year] International Energy Agency (IEA)	
Purchased electricity	Market-based	• eGRID • [Year] IEA • Residual Mixes	• Utility bill/metered consumption • Energy attribute certificates • Virtual power purchase agreements
Steam and heat	Market-based	[Year] EPA Emission Factors for GHG Inventories	• Utility bill/ metered consumption
Cooling	Location-based	[Year] IEA	• Utility bill/ metered consumption

Methodology descriptions

Emissions are calculated by multiplying the amount of company-purchased electricity, steam, heat and cooling consumed (in units of CO_2) by the appropriate emission factors.

Location-based method estimates are based on grid-average emission factors for defined geographic locations.

Market-based method estimates are based on emission factors derived from contractual instruments, which meet the 'Scope 2 Quality Criteria'. These may include supplier-specific emission factors or factors denoted through renewable energy certificates (RECs). When these factors are not available, emissions are estimated using residual mix factors.

c. Scope 3 emissions

Source	*Method*	*Emission factors*	*Inputs*
Category 1, purchased goods and services	Spend-based	EPA Supply Chain EEIO	Economic value of purchased goods and services from purchasing records
Category 6, business travel			
• Air travel	Distance-based	[Year] DEFRA	• Distance travelled • Flight type (long haul, short haul)

Source	*Method*	*Emission factors*	*Inputs*
• Hotel stay	Average-data	[Year] BEIS	Length of stay
• Rental car, personal mileage	Distance-based	[Year] EPA Emission Factors for GHG Inventories	• Distance travelled • Vehicle type (passenger car)
Category 7, employee commuting	Average-data	[Year] EPA Emission Factors for GHG Inventories	• Total employees, adjusted for those not commuting • Mode of transport (rail, car, foot, bus) • One-way commuting distance • Working days, adjusted for hybrid working model

Methodology descriptions

The spend-based method estimates emissions by collecting data on the economic value of assets and multiplying by relevant secondary (e.g. industry average) emission factors (e.g. average emissions per monetary value of goods).

The distance-based method estimates emissions using mass, distance and mode of transport, and applying the appropriate mass-distance emission factor for the vehicle used.

The average-data method estimates emissions using secondary emission factors for emissions per unit of consumption (e.g. kg CO_2e/kWh).

The Company used the following calculation tools in measuring its scope 3 emissions:[8]

- Purchased goods and services: DEF tool
- Employee commuting: XYZ tool.

d. Global Warming Potentials

The global warming potentials for all GHGs were sourced from the Intergovernmental Panel on Climate Change Fifth Assessment Report.

Notes to example:

1. In this example, the company has elected to present only the current year plus certain base year information (see Note 7). For further discussion about comparative information, see Question 11.3.20.
2. Emissions are presented on a gross basis and offset credits (by whatever name they are called) are not netted against emissions. Therefore, although presentation styles may vary, (1) gross emissions are required to be presented, and (2) any totals or subtotals do not misrepresent the net amount as being gross emissions. See section 10.3.
3. Question 11.2.30 discusses the presentation of select scope 3 categories.
4. See Note 2.
5. This example excludes emissions from biomass. If relevant, direct CO_2 emissions from the combustion of biomass are reported separately from the scopes. See Question 11.3.40.
6. If an individual gas is not relevant, it is common for that fact to be explained or to show zero emissions in a table such as this. See Question 11.3.30.
7. The GHGP requires disclosure of an emissions profile over time (that is consistent with and clarifies the chosen policy for making base year emissions recalculations). This graph provides a trend line, but an entity could instead provide alternative quantitative or qualitative disclosure that describes the effect on the base year.
8. The GHGP requires an entity to disclose a reference or link to any calculation tools used.

Index of changes

This index lists the significant changes made in this edition to assist you in locating recently updated content. Guidance that has been significantly updated or revised is identified with #. New guidance added in this edition is identified throughout the Handbook with **.

2. Foundational concepts

Future developments #

3. Organizational boundary

Reporting landscape: ISSB, ESRS

Organizational boundary #

5. Emissions calculations

Questions

5.2.65 What are the attributes to consider when selecting an emission factor? **

5.2.80 Can an emission factor be used that includes additional gases and radiative forcing impacts? **

Example

5.2.15 Selecting an emission factor **

7. Scope 2 emissions

Question

7.2.80 When may a location-based emission factor be used in a market-based method calculation? **

8. Scope 3 emissions

Questions

8.2.60 What are environmentally-extended input output (EEIO) models? #

8.9.30 Can teleworking emissions be included in category 7? **

Example

8.2.30 Applying the EEIO method **

Reporting landscape: ISSB, ESRS

Scope 3 emissions data #

10. Offset credits

Future developments #

11. Reporting

Question

11.2.40 If only certain scope 3 categories are presented, can the basis of preparation be the Scope 3 Standard? **

Example

11.3.10 Presenting biogenic emissions **

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Following developments

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California climate laws

In October 2023, the California Governor signed three climate disclosure laws. One of these, SB-253, Climate Corporate Data Accountability Act, requires the disclosure of GHG emissions (scopes 1, 2 and 3) for thousands of US companies doing business in California. Reporting commences in 2026 from a date still to be determined.

The California Legislature commenced a special session on December 2, aimed at progressing its state-level climate laws among others. Since then, the California Air Resource Board (CARB) issued an enforcement notice indicating that in the first year of reporting GHG emissions companies may submit scopes 1 and 2 emissions based on information they already possess or are already collecting as of December 5, 2024; and announced a public consultation with comments due to be submitted by February 14, 2025.

For background on the laws, read our Hot Topic, Effective dates near for California climate laws.

European Sustainability Reporting Standards

To learn more about ESRS, download our in-depth guide, ESRS Foundations.

To read about the applicability of the EU's Corporate Sustainability Reporting Directive outside of the EU, read our Hot Topic, Impact of EU sustainability reporting on US companies.

IFRS Sustainability Disclosure Standards

Our ISSB Standards Digital Hub provides practical guidance to help you get ready for the new IFRS Sustainability Disclosure Standards, capturing the latest thinking together with our insights.

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Acknowledgments

This handbook has been produced by the Department of Professional Practice of KPMG LLP in the United States in collaboration with other member firms of the KPMG network.

We would like to acknowledge the efforts of the main contributors to this edition:

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We would also like to acknowledge the significant contributions of the following individuals who contributed significantly to this Handbook:

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Gordon Crerar	Canada
Kieran Fearon	US
Trevor Gibbons	Canada
Maura Hodge	US
Mathilde Manueco	France
Darren McGann	US
Kazuhiko Saito	Japan
Konstantin Säuberlich	Germany
Aphiwe Twaku	KPMG EMA DPP Ltd

Lastly, we would like to thank the following individuals who generously contributed their time to this Handbook: Sion Atkins[1], Kimber Bascom, Anushka Chandrawat.

Note 1: Part of KPMG IFRS Limited.

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