6.4 EMISSIONS ACCOUNTING

Introduction to Scope 3 greenhouse gas emissions and calculations

Important notice
This unit is part of a package of learning materials designed to support understanding of foundational concepts relating to climate-related financial disclosures. These learning materials do not constitute application or regulatory guidance for the preparation of climate-related financial disclosures and are not intended to represent legal or professional advice. We encourage you to seek your own professional advice to find out how the *Corporations Act 2001* (Corporations Act) and other relevant laws may apply to you and your circumstances, as it is your responsibility to determine your obligations and comply with them.

Key topics

- Scope 3 greenhouse gas emissions
- Scope 3 categories in Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)*
- Scope 3 measurement framework

Relevance for climate-related disclosures

Understanding the fundamental concepts on Scope 1, 2 and 3 greenhouse gas emissions may support you in identifying and understanding your emissions as part of your climate-related financial disclosures.

In this unit, you will learn foundational concepts on Scope 3 greenhouse gas emissions, explore the 15 categories defined in the Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)* (GHG Protocol Scope 3 Standard), and gain an understanding of key aspects of the Scope 3 measurement framework used to calculate Scope 3 emissions across an entity's value chain.

Overview

Greenhouse gas emissions are categorised as Scope 1, Scope 2 or Scope 3 emissions.

Scope 3 greenhouse emissions are indirect greenhouse gas emissions (not included in Scope 2 greenhouse gas emissions) that occur in the value chain of an entity, including both upstream and downstream emissions.

Some entities may find calculating Scope 3 greenhouse gas emissions to be more complex than calculating Scope 1 and 2 emissions. This is because:

- it may require the entity to collect various types of information from sources outside of its control, and
- there may be challenges with the timeliness or quality of the data.

Entities may therefore rely on greater use of estimation techniques rather than primary data in calculating their Scope 3 greenhouse gas emissions.

An entity may find it useful to refer to the Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (2011) (GHG Protocol Scope 3 Standard) and *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (2004) (GHG Protocol Corporate Standard) to understand and identify its Scope 3 greenhouse gas emissions.

Scope 3 greenhouse gas emissions are grouped into 15 categories in the GHG Protocol Scope 3 Standard.

Scope 3 greenhouse emissions

Scope 3 greenhouse gas emissions are indirect greenhouse gas emissions that occur in an entity's value chain (excluding the entity's Scope 2 emissions), and are typically described as:

- Upstream Scope 3 greenhouse gas emissions—which relate to purchased or acquired goods and services (e.g. from suppliers), including the transportation of goods and services, employee travel and operational waste
- Downstream Scope 3 greenhouse gas emissions—which relate to the transport, use and disposal of produced and sold goods and services (e.g. to customers), as well as assets leased to other entities, and emissions by franchises and through investments.

Even though these emissions happen outside the entity's control, they are associated with the entity's activities and are therefore still part of its emissions inventory. A useful way to think about Scope 3 emissions is that they are the Scope 1 and 2 greenhouse gas emissions of external entities that fall within your entity's inventory boundary and which you have not accounted for in your Scope 1 and 2 emissions. Before you begin measuring your entity's greenhouse gas emissions, you may find it useful to familiarise yourself with the GHG Protocol Corporate Standard.

When identifying your entity's Scope 3 greenhouse gas emissions, you will need to consider your entity's entire value chain across all 15 categories of Scope 3 emissions as described in the GHG Protocol Scope 3 Standard.

Scope 3 categories

The GHG Protocol Scope 3 Standard defines 15 categories of Scope 3 emissions—eight of which are upstream and seven downstream emission categories, as depicted in Table 1 below.

Table 1: Adapted from Table [5.3] Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (2011) [1]

Category	Description	Example
Upstream Scope 3 emissions		
1. **Purchased goods and services**	Emissions from extracting, producing and transporting goods or services your entity purchases or acquires	Emissions from producing cotton that is purchased by a clothing brand entity
2. **Capital goods**	Emissions from extracting, producing and transporting capital goods or long-term assets your entity purchases or acquires	Emissions from the production of machinery or factories which are purchased by an entity
3. **Fuel- and energy-related activities (not included in Scope 1 and 2)**	Emissions from extracting, producing and transporting fuels and energy your entity purchases or acquires	Emissions associated with the production of fuels purchased by an entity (before they are combusted by the entity)

4. **Upstream transportation and distribution**	Emissions from transporting goods to your entity, or between your own facilities	Emissions from shipping raw materials to an entity's processing facility
5. **Waste generated in operations**	Emissions from waste treatment and disposal	Emissions from landfill waste that originated from an entity's office operations
6. **Business travel**	Emissions from employee travel due to business-related activities	Emissions from flights for employees to attend inter-state meetings
7. **Employee commuting**	Emissions from employees travelling between home and work	Emissions from employees driving to the office
8. **Upstream leased assets**	Emissions from assets the company leases (not owned)	Emissions from energy consumed by a warehouse leased by an entity to carry on its business
Downstream Scope 3 emissions		
9. **Downstream transportation and distribution**	Emissions from transporting and distributing products to the end consumer (including retail and storage)	Emissions from transporting food products to an entity's customers
10. **Processing of sold products**	Emissions from further processing of sold products by downstream companies	Emissions due to a customer processing steel sold by an entity into cars parts
11. **Use of sold products**	Emissions from customers using your entity's products or services	Emissions from customers using electrical appliances sold by a retailer
12. **End-of-life treatment of sold products**	Emissions from disposal of products sold by your entity	Emissions from incinerating product packaging used by an entity
13. **Downstream leased assets**	Emissions from assets leased by an entity to others	Emissions resulting from energy (such as heating, cooling and electricity) use from a building leased out by an entity
14. **Franchises**	Emissions from franchise operations	Emissions from energy (such as heating, cooling and heating) use, waste and other operational activities from a franchised fast-food outlet
15. **Investments**	Emissions from investments (including equity and debt investments and project finance) an entity makes	Emissions generated by the companies held within an entity's investment portfolio

When identifying your Scope 3 greenhouse gas emissions, you should:

- assess your full value chain—both upstream (such as suppliers) and downstream (such as customers)
- consider all 15 categories of Scope 3 greenhouse gas emissions, as outlined in Table 1 above (keeping in mind that while an entity should consider all 15 categories, it is likely that only some categories will be relevant to your entity's circumstances rather than all 15 categories)
- specify which of these categories are included in your Scope 3 emissions inventory, and
- reassess the impact of any significant events or change in circumstances (direct or indirect) on climate-related risks and opportunities across the entire value chain, and the impact on your emissions inventory.

If your entity is involved in financial activities such as investment activities, asset management, commercial banking or insurance, it should also consider the financed emissions linked to those activities (category 15). Financed emissions are covered in Module 6 Unit 5.

Accounting for Scope 3 greenhouse gas emissions

When calculating Scope 3 greenhouse gas emissions, you may find it useful to familiarise yourself with the GHG Protocol Corporate Standard. You may also find it useful to become familiar with the GHG Protocol Scope 3 Standard, the GHG Protocol's *Technical Guidance for Calculating Scope 3 Emissions* or to consider whether your entity can use an alternative method for calculating emissions.

Entities can consider the following key steps (as explored in Module 6 Unit 1) when identifying and calculating Scope 3 greenhouse gas emissions:

- Set inventory boundary
- Identify sources of Scope 3 greenhouse gas emissions
- Choose calculation methodology
- Gather activity data and emission factors
- Calculate greenhouse gas emissions using calculation tools
- Aggregate emissions data

When measuring Scope 3 greenhouse gas emissions, entities are likely to rely on estimates rather than direct measurement alone. When measuring Scope 3 emissions, entities are likely to rely on gathering activity data rather than emissions data from other entities within the value chain. The selected measurement approach, inputs and assumptions should be documented and provide a faithful representation of emissions.

Scope 3 greenhouse gas emissions are reported in metric tonnes of carbon dioxide equivalent (CO_2-e), similar to Scope 1 and 2 emissions.

Example: Scope 3 greenhouse gas emissions calculation

As a practical example, consider this scenario: you work for an entity that produces packaged food products, and you want to calculate the entity's Scope 3 greenhouse gas emissions. This example will follow a similar five-step process to that presented in Module 6 Units 1 and 2 to calculate the entity's Scope 3 greenhouse gas emissions.

Note: This example uses estimates and average emission factors. When calculating emissions, it is important to:

- Use current and appropriate emission factors
- Document all assumptions, data sources and methodologies

Table 2: Example Scope 3 greenhouse gas emissions calculation

Step	Description
Step 1: Identify relevant Scope 3 categories	After considering all the Scope 3 emissions categories, you decide to focus on the following categories which best represent your entity's Scope 3 greenhouse gas emissions: › Category 1: Purchased goods and services (e.g. packaging materials) › Category 5: Waste generated in operations (e.g. food scraps) › Category 9: Downstream transportation and distribution (e.g. shipping products to retailers)

Step 2: Choose an appropriate calculation methodology	When considering your entity's particular circumstances, you determine that the estimation method is more appropriate than primary data collection. Estimation of Scope 3 greenhouse gas emissions is based on activity data and emission factors.
Step 3: Gather activity data and select emission factor	A review of internal records provided by internal departments and suppliers revealed that during the reporting year, your entity: › purchased 100 tonnes of cardboard packaging › shipped 500 tonnes of products using third-party freight services (10,000 kilolitres or kL of diesel used for transport purposes) › generated 20 tonnes of food waste. The relevant Scope 3 emission factors from the Australian National Greenhouse Accounts Factors (NGA Factors) as published by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), or as provided directly by the supplier, are outlined below [2]: **Scope 3 greenhouse gas emission** — **Emission factor (2025)** Cardboard packaging (assuming emission factor provided directly by packaging supplier) — 0.48 tCO_2-e/t Freight transport (assuming heavy duty vehicles)—from the NGA Factors for 2025 — 17.3 kg CO_2-e/GJ Food waste—from the NGA Factors for 2025 — 2.1 tCO_2-e/t
Step 4: Calculate Scope 3 greenhouse gas emissions	Scope 3 greenhouse gas emissions are calculated as the activity data multiplied by the emission factor for each activity. **Cardboard packaging:** Scope 3 greenhouse gas emissions from cardboard packaging = 100 tonnes x 0.48 tCO_2-e/t = 48 tCO_2-e **Diesel oil in heavy duty vehicles:** The volume of diesel (in kL) first needs to be converted into its equivalent energy content (in gigajoules or GJ) using the NGA Factors. Energy content factor for diesel oil in heavy duty vehicles (2025) = 38.6GJ/kL Energy content = 10,000kL x 38.6GJ/kL* = 386,000 GJ *38.6 GJ/kL means each kilolitre (1000 litres) of fuel contains 38.6 gigajoules of energy, which is a typical amount of energy found in diesel and other fuels made from petroleum[3]. Scope 3 greenhouse gas emissions from diesel used in heavy duty vehicles for freight = 386,000GJ x 17.3 kg CO_2-e/GJ = 6,677,800 kg CO_2-e (divided by 1,000 to convert into tonnes = 6,678 tCO_2-e) **Food waste:**

	The estimated Scope 3 greenhouse gas emissions from the disposal of food waste to landfill using NGA Factors is calculated as: Scope 3 greenhouse gas emissions from food waste = 20 tonnes x 2.1 tCO_2-e/t = 42 tCO_2-e
Step 5: Aggregate emissions data to the corporate level	Total Scope 3 greenhouse gas emissions (tCO_2-e) for cardboard packaging, diesel oil in heavy duty vehicles, and food waste = 48 + 6,678 + 42 tCO_2-e = 6,768 tCO_2-e

Key takeaways

- Scope 3 greenhouse gas emissions are indirect emissions that occur in the value chain of an entity, including both upstream and downstream emissions (and are not an entity's Scope 2 greenhouse gas emissions)
- Entities need to consider all 15 Scope 3 categories as set out in the Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)*, and specify which categories are included in their measurement of Scope 3 greenhouse gas emissions
- When calculating greenhouse gas emissions, you may find it helpful to familiarise yourself with the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004).* Depending on the specific circumstances of the entity, you may also consider the GHG Protocol Scope 3 Standard and the Australian Government's National Greenhouse Accounts Factors
- Calculation of Scope 3 greenhouse gas emissions typically ranges from data supplied by entities in the value chain, to using estimates
- Entities should document the reasons for choosing a particular measurement approach and the inputs and assumptions used to measure their emissions

Sources

[1] GHG Protocol, *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)*, p32
[2] Commonwealth Department of Climate Change, Energy, the Environment and Water (2025) *Australian National Greenhouse Accounts Factors*
[3] Clean Energy Regulator (2025) *Estimating emissions and energy from fuel combustion guideline*, p27